

# Supermicro Switch Configuration CLI Guide



**SMIS**

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# Supermicro Switch Configuration CLI Guide

Super Micro Intelligent Switch

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## Chapter

# 16

## STP

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STP (Spanning-Tree Protocol) is a link management protocol that provides path redundancy while preventing undesirable loops in the network that are created by multiple active paths between stations. To establish path redundancy, STP creates a tree that spans all of the switches in an extended network, forcing redundant paths into a standby or blocked state.

For an Ethernet network to function properly, only one active path should exist between two stations. Multiple active paths between stations in a bridged network can cause loops in which Ethernet frames can endlessly circulate. STP logically breaks such loops and prevents looping traffic from clogging the network. The dynamic control of the topology provides continued network operation in the presence of redundant or unintended looping paths.

The list of CLI commands for the configuration of STP is common to both SI and MI except for a difference in the prompt that appears for the switch with MI support. The prompt for the switch configuration Mode is,

```
Your Product(config-switch)# spanning-tree Mode rst
```

The STP functionality is realized in the network using one of the three following STPs:

- RSTP
- MSTP

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## 16.1 STP Commands Common for RSTP and MSTP

This section describes all spanning tree protocol Related Commands that are common for all kinds of STPs.

### **RSTP**

**SMIS RSTP** is an implementation of the IEEE 802.1D standard. It provides rapid recovery of connectivity following the failure of a bridge/bridge port or a LAN. It reduces the time to reconfigure the active topology of the network when physical topology or topology configuration parameters changes. It provides increased availability of MAC service when there is a reconfiguration or failure of components in a bridged LAN. It can interoperate with legacy STP bridges without any change in the configuration.

The list of common STP commands for the configuration of STP (RSTP / MSTP) is as follows:

- [shutdown spanning-tree](#)
- [spanning-tree](#)
- [spanning-tree Mode](#)
- [spanning-tree compatibility](#)
- [spanning-tree timers](#)
- [spanning-tree transmit hold-count](#)
- [clear spanning-tree counters](#)
- [spanning-tree pathcost dynamic](#)
- [spanning-tree priority](#)
- [spanning-tree auto-edge](#)
- [spanning-tree - Properties of an interface](#)
- [spanning-tree portfast - disable | trunk](#)
- [spanning-tree portfast - bpdufilter default | bpduguarddefault | default](#)
- [spanning-tree restricted-role](#)
- [spanning-tree restricted-tcn](#)
- [spanning-tree layer2-gateway-port](#)
- [spanning-tree bpdu-receive](#)
- [spanning-tree bpdu-transmit](#)
- [spanning-tree loop-guard](#)
- [spanning-tree – Pseudoroot configuration](#)
- [debug spanning-tree](#)
- [clear spanning-tree detected protocols](#)
- [show spanning-tree - Summary, Blockedports, Pathcost, Redundancy](#)
- [show spanning-tree detail](#)
- [show spanning-tree active](#)
- [show spanning-tree interface](#)
- [show spanning-tree root](#)

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- [show spanning-tree bridge](#)
- [show spanning-tree – layer 2 gateway port](#)
- [show customer spanning-tree](#)
- [spanning-tree forwarddelay optimization alternate-role](#)

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## 16.1.1 shutdown spanning-tree

<b>Command Objective</b>	This command shuts down spanning tree functionality in the switch. The switch does not execute any kind of STP to form a loop free topology in the Ethernet network and operates with the existing topology structure.
<b>Syntax</b>	<code>shutdown spanning-tree</code>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	Spanning tree MSTP is started and enabled in the switch.
<b>Example</b>	<code>Your Product(config)# shutdown spanning-tree</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>base bridge-Mode</code> - Configures the base Mode (either 802.1d transparent bridge Mode or 802.1q vlan aware bridge Mode) in which the VLAN feature should operate on the switch.</li><li>• <code>spanning-tree</code> - Enables the spanning tree operation in the switch for the selected spanning tree Mode.</li><li>• <code>spanning-tree Mode</code> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li><li>• <code>spanning-tree compatibility</code> - Sets the STP compatibility version in the switch for all ports.</li><li>• <code>spanning-tree timers</code> - Sets the spanning tree timers such as hello time, that are used for controlling the transmission of BPDUs during the computation of loop free topology.</li><li>• <code>spanning-tree transmit hold-count</code> - Sets the transmit hold-count value for the switch.</li><li>• <code>clear spanning-tree counters</code> - Deletes all bridge and port level spanning tree statistics information.</li><li>• <code>spanning-tree pathcost dynamic</code> - Enables dynamic pathcost calculation feature in the switch.</li><li>• <code>spanning-tree priority</code> - Configures the priority value that is assigned to the switch.</li><li>• <code>spanning-tree auto-edge</code> - Enables automatic detection of Edge port parameter of an interface.</li></ul>

- **spanning-tree - Properties of an interface** - Configures the port related spanning tree information for all kinds of STPs and creates port in STP when Automatic Port Create feature is disabled.
  - **spanning-tree restricted-role** - Enables the restricted role feature for a port.
  - **spanning-tree restricted-tcn** - Enables the topology change guard / restricted TCN feature on a port.
  - **spanning-tree layer2-gateway-port** - Configures a port to operate as a L2GP.
  - **spanning-tree bpdu-receive** - Configures the processing status of the BPDUs received in a port.
  - **spanning-tree bpdu-transmit** - Configures the BPDU transmission status of a port.
  - **spanning-tree loop-guard** - Enables the loop guard feature in a port.
  - **spanning-tree - Pseudoroot configuration** - Configures the pseudoroot related information for a port set as L2GP.
  - **show spanning-tree - Summary, Blockedports, Pathcost, redundancy** - Displays spanning tree related information available in the switch for the current STP enabled in the switch.
  - **show spanning-tree detail** - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.
  - **show spanning-tree active** - Displays spanning tree related information available in the switch for the current STP enabled in the switch.
  - **show spanning-tree interface** - Displays the port related spanning tree information for the specified interface.
  - **show spanning-tree root** - Displays the spanning tree root information.
  - **show spanning-tree bridge** - Displays the spanning tree bridge information.
  - **show spanning-tree - layer 2 gateway port** - Displays spanning tree information for all L2GPs enabled in the switch.
  - **spanning-tree mst max-hops** - Configures the maximum number of hops permitted in the MST.
  - **spanning-tree mst configuration** - Enters into MST configuration Mode, where instance specific and MST region configuration can be done.
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- **spanning-tree mst max-instance** - Configures the maximum number of active MSTIs that can be created.
- **spanning-tree mst- Properties of an interface for MSTP** - Configures the port related spanning tree information for a specified MSTI.
- **spanning-tree mst hello-time** - Configures the hello time for an interface that is enabled.
- **show spanning-tree mst - CIST or specified mst Instance** - Displays multiple spanning tree information for all MSTIs in the switch.
- **show spanning-tree mst configuration** - Displays multiple spanning tree instance related information.
- **show spanning-tree mst - Port Specific Configuration** - Displays multiple spanning tree port specific information for the specified port.
- **spanning-tree vlan** - Configures spanning tree related information on a per VLAN basis.
- **spanning-tree bpduguard** - Configures the status of BPDU guard feature in an interface.
- **spanning-tree guard** - Configures the various PVRST guard features such as root guard, in a port.
- **spanning-tree encap** - Configures the encapsulation type to be used in an interface.
- **spanning-tree vlan status** - Configures the status of PVRST on a port for the specified VLAN.
- **spanning-tree vlan port-priority** - Configures the priority of a port for the specified VLAN.
- **spanning-tree vlan cost** - Configures the cost of a port for the specified VLAN.
- **show spanning-tree vlan - Summary, Blockedports, Pathcost** - Displays PVRST related information for the specified VLAN.
- **show spanning-tree vlan - bridge** - Displays the PVRT related information of the bridge for the specified VLAN ID.
- **show spanning-tree vlan - root** - Displays the PVRT related information of the root, for the specified VLAN ID.
- **show spanning-tree vlan - interface** - Displays interface specific PVRST information for the specified VLAN.



## 16.1.2 spanning-tree

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<b>Command Objective</b>	<p>This command enables the spanning tree operation in the switch for the selected spanning tree Mode.</p> <p>Spanning tree operation provides path redundancy while preventing undesirable loops in the network that are created by multiple active paths between stations. It logically breaks such loops and prevents looping traffic from clogging the network.</p> <p>The no form of this command disables the spanning tree operation in the switch. The spanning tree operation is automatically enabled in the switch, once the spanning tree Mode is changed.</p>
<b>Syntax</b>	<p><code>spanning-tree</code></p> <p><code>no spanning-tree</code></p>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	Spanning tree MSTP is started and enabled in the switch.
	The spanning tree operation can be enabled in the switch only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.
<b>Example</b>	<code>Your Product(config)#spanning-tree</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>shutdown spanning-tree</code> - Shuts down spanning tree functionality in the switch.</li><li>• <code>spanning-tree Mode</code> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li><li>• <code>show spanning-tree - Summary, Blockedports, Pathcost, redundancy</code> - Displays spanning tree related information available in the switch for the current STP enabled in the switch.</li><li>• <code>show spanning-tree detail</code> - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.</li><li>• <code>show spanning-tree active</code> - Displays spanning tree related information available in the switch for the current STP enabled in the switch.</li></ul>

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- **show spanning-tree interface** - Displays the port related spanning tree information for the specified interface.
  - **show spanning-tree bridge** - Displays the spanning tree bridge information.
  - **show spanning-tree mst - CIST or specified mst Instance** - Displays multiple spanning tree information for all MSTIs in the switch.
  - **show spanning-tree mst - Port Specific Configuration** - Displays multiple spanning tree port specific information for the specified port.
  - **show spanning-tree vlan - Summary, Blockedports, Pathcost** - Displays PVRST related information for the specified VLAN.
  - **show spanning-tree vlan - interface** - Displays interface specific PVRST information for the specified VLAN.
-

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## 16.1.3 spanning-tree Mode

<b>Command Objective</b>	This command sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch. The current selected type of spanning tree is enabled and the existing spanning tree type is disabled in the switch.
<b>Syntax</b>	<code>spanning-tree Mode {mst rst}</code>  <code>no spanning-tree Mode</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>mst</b> - Configures the switch to execute MSTP for preventing undesirable loops. MSTP configures spanning tree on per VLAN basis or multiple VLANs per spanning tree. The Mode cannot be set as mst, if the base bridge Mode is configured as transparent bridging.</li><li>• <b>rst</b> - Configures the switch to execute RSTP for preventing undesirable loops. RSTP provides rapid recovery of connectivity following the failure of a bridge/bridge port or a LAN.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	mst
<b>Example</b>	Your Product(config)#spanning-tree Mode rst
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>base bridge-Mode</b> - Configures the base Mode (either 802.1d transparent bridge Mode or 802.1q vlan aware bridge Mode) in which the VLAN feature should operate on the switch.</li><li>• <b>set gvrp disable</b> – Globally disables GVRP feature on all ports of a switch.</li><li>• <b>shutdown spanning-tree</b> - Shuts down spanning tree functionality in the switch.</li><li>• <b>spanning-tree</b> - Enables the spanning tree operation in the switch for the selected spanning tree Mode.</li><li>• <b>spanning-tree compatibility</b> - Sets the STP compatibility version in the switch for all ports.</li><li>• <b>spanning-tree timers</b> - Sets the spanning tree timers such as hello time, that are used for controlling the transmission of BPDUs during the computation of loop free topology.</li><li>• <b>spanning-tree transmit hold-count</b> - Sets the transmit hold-count value for the switch.</li></ul>

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- **clear spanning-tree counters** - Deletes all bridge and port level spanning tree statistics information.
- **spanning-tree pathcost dynamic** - Enables dynamic pathcost calculation feature in the switch.
- **spanning-tree priority** - Configures the priority value that is assigned to the switch.
- **spanning-tree auto-edge** - Enables automatic detection of Edge port parameter of an interface.
- **spanning-tree - Properties of an interface** - Configures the port related spanning tree information for all kinds of STPs and creates port in STP when Automatic Port Create feature is disabled.
- **spanning-tree restricted-role** - Enables the restricted role feature for a port.
- **spanning-tree restricted-tcn** - Enables the topology change guard / restricted TCN feature on a port.
- **spanning-tree layer2-gateway-port** - Configures a port to operate as a L2GP.
- **spanning-tree bpdu-receive** - Configures the processing status of the BPDUs received in a port.
- **spanning-tree bpdu-transmit** - Configures the BPDU transmission status of a port.
- **spanning-tree loop-guard** - Enables the loop guard feature in a port.
- **spanning-tree - Pseudoroot configuration** - Configures the pseudoroot related information for a port set as L2GP.
- **show spanning-tree - Summary, Blockedports, Pathcost, redundancy** - Displays spanning tree related information available in the switch for the current STP enabled in the switch.
- **show spanning-tree detail** - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.
- **show spanning-tree active** - Displays spanning tree related information available in the switch for the current STP enabled in the switch.
- **show spanning-tree interface** - Displays the port related spanning tree information for the specified interface.
- **show spanning-tree root** - Displays the spanning tree root information.

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- **show spanning-tree bridge** - Displays the spanning tree bridge information.
- **show spanning-tree - layer 2 gateway port** - Displays spanning tree information for all L2GPs enabled in the switch.
- **spanning-tree mst max-hops** - Configures the maximum number of hops permitted in the MST.
- **spanning-tree mst max-instance** - Configures the maximum number of active MSTIs that can be created.
- **spanning-tree mst configuration** - Enters into MST configuration Mode, where instance specific and MST region configuration can be done.
- **spanning-tree mst- Properties of an interface for MSTP** - Configures the port related spanning tree information for a specified MSTI.
- **spanning-tree mst hello-time** - Configures the hello time for an interface that is enabled.
- **show spanning-tree mst - CIST or specified mst Instance** - Displays multiple spanning tree information for all MSTIs in the switch.
- **show spanning-tree mst configuration** - Displays multiple spanning tree instance related information.
- **show spanning-tree mst - Port Specific Configuration** - Displays multiple spanning tree port specific information for the specified port.
- **spanning-tree vlan** - Configures spanning tree related information on a per VLAN basis.
- **spanning-tree bpduguard** - Configures the status of BPDU guard feature in an interface.
- **spanning-tree guard** - Configures the various PVRST guard features such as root guard, in a port.
- **spanning-tree encap** - Configures the encapsulation type to be used in an interface.
- **spanning-tree vlan status** - Configures the status of PVRST on a port for the specified VLAN.
- **spanning-tree vlan port-priority** - Configures the priority of a port for the specified VLAN.
- **spanning-tree vlan cost** - Configures the cost of a port for the specified VLAN.


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- **show spanning-tree vlan - Summary, Blockedports, Pathcost** - Displays PVRST related information for the specified VLAN.
  - **show spanning-tree vlan - bridge** - Displays the PVRT related information of the bridge for the specified VLAN ID.
  - **show spanning-tree vlan - root** - Displays the PVRT related information of the root, for the specified VLAN ID.
  - **show spanning-tree vlan - interface** - Displays interface specific PVRST information for the specified VLAN.
  - **spanning-tree flush-interval** - Configures the flush interval timer value
  - **spanning-tree flush-indication-threshold** - Configures the flush indication threshold value for a specific instance.
  - **spanning-tree forwarddelay optimization alternate-role** - enables and disables the optimization for spanning-tree related protocol in alternate port role transition.
-

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## 16.1.4 spanning-tree compatibility

<b>Command Objective</b>	<p>This command sets the STP compatibility version in the switch for all ports.</p> <p>The no form of this command sets the STP compatibility version to its default value. The STP compatibility version is changed to its default value even if the spanning tree Mode is changed.</p> <p>The compatibility version allows the switch to temporarily operate (that is, till this configuration is reset manually) in other STP version even though the spanning tree Mode is set as some other version. This configuration is useful during cases where spanning tree Mode itself is not required to be changed.</p>
<b>Syntax</b>	<pre>spanning-tree compatibility {stp rst mst}  no spanning-tree compatibility</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>stp</b> - Configures the switch to execute spanning tree operation as specified in IEEE 802.1D.</li><li>• <b>rst</b> - Configures the switch to execute spanning tree operation as specified in IEEE 802.1w.</li><li>• <b>mst</b> - Configures the switch to execute spanning tree operation as specified in IEEE 802.1s. The STP compatibility version cannot be set as mst, if the spanning tree Mode is set as rst.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	<p>If STP Mode is set as mst, then spanning tree compatibility is set as mst.</p> <p>If STP Mode is set as rst, then spanning tree compatibility is set as rst.</p>
	<p>The STP compatibility version can be configured in the switch, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.</p> <p>The STP compatibility version does not change the operation of the switch whose spanning tree Mode is set as PVRST.</p>
<b>Example</b>	<pre>Your Product(config)#spanning-tree compatibility stp</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>shutdown spanning-tree</b> - Shuts down spanning tree functionality in the switch.</li></ul>



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- **spanning-tree Mode** - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.
  - **show spanning-tree - Summary, Blockedports, Pathcost, redundancy** - Displays spanning tree related information available in the switch for the current STP enabled in the switch.
  - **show spanning-tree detail** - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.
  - **show spanning-tree active** - Displays spanning tree related information available in the switch for the current STP enabled in the switch.
  - **show spanning-tree vlan - Summary, Blockedports, Pathcost** - Displays PVRST related information for the specified VLAN.
-



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## 16.1.5 spanning-tree timers

<b>Command Objective</b>	<p>This command sets the spanning tree timers such as hello time used for controlling the transmission of BPDUs during the computation of loop free topology.</p> <p>The no form of this command resets the spanning tree timers to its default values. The spanning tree timers are reset to its default value, even if the spanning tree Mode is changed.</p>
<b>Syntax</b>	<pre>spanning-tree {forward-time &lt;seconds(4-30)&gt;   hello-time &lt;seconds(1-2)&gt;   max-age &lt;seconds(6-40)&gt;}  no spanning-tree { forward-time   hello-time   max-age }</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>forward-time</b> - Configures the number of seconds, a port waits before changing from the blocking state to the forwarding state. This value ranges between 4 and 30 seconds. In MSTP, this time configuration is applied for IST root (that is, MSTI 0).</li><li>• <b>hello-time</b> - Configures the time interval (in seconds) between two successive configuration BPDUs generated by the root switch. This value should be either 1 or 2 seconds. This value is configured on per-port basis for MSTP and is configured globally for RSTP.</li><li>• <b>max-age</b> - Configures the maximum expected arrival time (in seconds) of hello BPDUs. STP information learned from network on any port is discarded, once the configured arrival time expires. The spanning tree topology is re-computed after this time interval. This value ranges between 6 and 40 seconds. In MSTP, this time configuration is applied for IST root (that is, MSTI 0).</li></ul> <p> Spanning-tree timers can be configured in centi seconds through SNMP</p>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	<ul style="list-style-type: none"><li>• forward-time - 15 seconds</li><li>• hello-time - 2 seconds</li><li>• max-age - 20 seconds</li></ul>
	<p>The values configured for the spanning tree timers should satisfy the following conditions:</p> $2 * (\text{forward-time} - 1) \geq \text{max-age}, \text{ and}$ $\text{max-age} \geq 2 * (\text{hello-time} + 1)$

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The STP timers can be configured in the switch, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.

This spanning tree timer's configuration is not supported in PVRST Mode.

---

**Example**

```
Your Product(config)#spanning-tree max-age 6
```

---

**Related Command(s)**

- **shutdown spanning-tree** - Shuts down spanning tree functionality in the switch.
  - **spanning-tree Mode** - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.
  - **show spanning-tree - Summary, Blockedports, Pathcost, redundancy** - Displays spanning tree related information available in the switch for the current STP enabled in the switch.
  - **show spanning-tree detail** - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.
  - **show spanning-tree active** - Displays spanning tree related information available in the switch for the current STP enabled in the switch.
  - **show spanning-tree interface detail** - Displays detailed spanning tree related information for the specified port.
  - **show spanning-tree root** - Displays the spanning tree root information.
  - **show spanning-tree bridge** - Displays the spanning tree bridge information.
  - **show spanning-tree mst - CIST or specified mst Instance** - Displays multiple spanning tree information for all MSTIs in the switch.
  - **show spanning-tree mst - Port Specific Configuration** - Displays multiple spanning tree port specific information for the specified port.
-

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## 16.1.6 spanning-tree transmit hold-count

---

**Command Objective** This command sets the BPDU transmit hold-count value for the switch. The transmit hold count value is a counter that is used to limit the maximum BPDU transmission rate of the switch and to avoid flooding. This value specifies the maximum number of BPDU packets that can be sent in a given hello time interval. This value ranges between 1 and 10.

The no form of this command sets the transmit hold-count to its default value. The transmit hold-count is changed to its default value even if the spanning tree Mode is changed.

---

**Syntax** `spanning-tree transmit hold-count <value (1-10)>`

`no spanning-tree transmit hold-count`

---

**Mode** Global Configuration Mode

---

**Default** 6, if the spanning tree Mode is set as mst.  
3, if the spanning tree Mode is set as rst or pvrst.



The transmit hold-count value can be configured in the switch, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.

This transmit hold count value configuration is not supported in PVRST Mode.

---

**Example** `Your Product(config)#spanning-tree transmit hold-count 5`

---

**Related Command(s)**

- `shutdown spanning-tree` - Shuts down spanning tree functionality in the switch.
- `spanning-tree Mode` - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.
- `show spanning-tree detail` - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.
- `show spanning-tree active detail` - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.
- `show spanning-tree vlan - Summary, Blockedports, Pathcost` - Displays PVRST related information for the specified VLAN.

---

## 16.1.7 clear spanning-tree counters

---

**Command Objective** This command deletes all bridge and port level spanning tree statistics information.

For RSTP, the information contains number of:

- Transitions to forwarding state
- RSTP BPDU count received / transmitted
- Config BPDU count received / transmitted
- TCN BPDU count received / transmitted
- Invalid BPDU count transmitted
- Port protocol migration count

For MSTP, the information contains number of:

- Port forward transitions
- Port received BPDUs
- Port transmitted BPDUs
- Port invalid BPDUs received
- Port protocol migration count
- BPDUs sent / received for each MSTI

---

**Syntax** `clear spanning-tree [mst <instance-id>] counters[interface <interface-type> <interface-id>]`

---

**Parameter Description**

- `mst <instance-id>]` - Clears the statistical counters specific to the MSTP instance already created in the switch. This value ranges between 1 and 64. The special value 4094 can be used only in the switch that supports PBB-TE. This special value represents PTETID that identifies VID used by ESPs. This option is applicable, only if the spanning tree Mode is set as mst.
- `interface` - Clears all port-level spanning-tree statistics information for the given port.
  - `<interface-type>` - Clears all port-level spanning-tree statistics information for the specified type of interface. The interface can be:
    - `gigabitethernet` – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.

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- qx-ethernet – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.
- extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.
- port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
- **<interface-id>** - Clears all port-level spanning-tree statistics information for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. For Example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided, for interface types port-channel. For Example: 1 represents port-channel ID.

---

**Mode** Global Configuration Mode



The statistics information can be deleted, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.

---

**Example** `Your Product(config)# clear spanning-tree mst 1 counters`

---

**Related Command(s)**


- `shutdown spanning-tree` - Shuts down spanning tree functionality in the switch.
- `spanning-tree Mode` - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.
- `instance` - Creates an MST instance and maps it to VLANs.
- `show spanning-tree detail` - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.
- `show spanning-tree active detail` - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.
- `show spanning-tree interface` - Displays the port related spanning tree information for the specified interface.
- `show spanning-tree mst - CIST or specified mst Instance` - Displays multiple spanning tree information for all MSTIs in the switch.
- `show spanning-tree mst - Port Specific Configuration` - Displays multiple spanning tree port specific information for the specified port.

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- **show spanning-tree vlan - Summary, Blockedports, Pathcost** - Displays PVRST related information for the specified VLAN.
  - **show spanning-tree vlan - interface** - Displays interface specific PVRST information for the specified VLAN.
-

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## 16.1.8 spanning-tree pathcost dynamic

<b>Command Objective</b>	<p>This command enables dynamic pathcost calculation feature in the switch.</p> <p>The no form of this command disables dynamic pathcost calculation feature in the switch. The dynamic pathcost calculation feature is disabled, even if the spanning tree Mode is changed.</p> <p>The path cost of the port / MSTI is dynamically calculated. This feature is applied only for the ports that are not shutdown during the execution of STP. The calculated path cost is not changed based on the operational status of the port / for a MSTI, once calculated. The manually assigned / already calculated path cost is used even if the dynamic pathcost calculation feature is enabled in the switch.</p>
<b>Syntax</b>	<pre>spanning-tree pathcost dynamic [lag-speed]  no spanning-tree pathcost dynamic [lag-speed]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>lag-speed</b> - Calculates the path cost for change in speed of the port. This feature is used for LA ports whose speed changes due to addition or deletion of ports from the port channel. The manually assigned path cost is used even if the lag speed feature is enabled in the switch, if the path cost is assigned manually. The lag speed feature can be enabled, only after enabling the dynamic pathcost calculation feature.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	Dynamic pathcost calculation feature is disabled in the switch.
	The dynamic pathcost calculation feature can be configured in the switch, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.
<b>Example</b>	<pre>Your Product(config)# spanning-tree pathcost dynamic</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>shutdown spanning-tree</b> - Shuts down spanning tree functionality in the switch.</li><li>• <b>spanning-tree Mode</b> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li><li>• <b>spanning-tree - Properties of an interface</b> - Configures the port related spanning tree information for all kinds of STPs and creates port in STP when Automatic Port Create feature is disabled.</li></ul>

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- **show spanning-tree - Summary, Blockedports, Pathcost, redundancy** – Displays spanning tree related information available in the switch for the current STP enabled in the switch.
  - **show spanning-tree detail** - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.
  - **show spanning-tree active** - Displays spanning tree related information available in the switch for the current STP enabled in the switch.
  - **spanning-tree mst- Properties of an interface for MSTP** - Configures the port related spanning tree information for a specified MSTI.
  - **spanning-tree vlan cost** - Configures the cost of a port for the specified VLAN.
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## 16.1.9 spanning-tree priority

<b>Command Objective</b>	<p>This command configures the priority value that is assigned to the switch.</p> <p>The no form of this command resets the priority to its default value. The priority value is changed to its default value even if the spanning tree Mode is changed.</p> <p>In RSTP, this value is used during the election of root. In MSTP, this value is used during the election of CIST root, CIST regional root and IST root.</p>
<b>Syntax</b>	<pre>spanning-tree [mst &lt;instance-id&gt;] priority &lt;value(0-61440)&gt;</pre> <pre>no spanning-tree [mst &lt;instance-id(1-64)&gt;] priority</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>mst &lt;instance-id&gt;</b> - Configures the ID of MSTP instance already created in the switch. This value ranges between 1 and 64. The special value 4094 can be used only in the switch that supports PBB-TE. This special value represents PTETID that identifies VID used by ESPs. This option is applicable, only if the spanning tree Mode is set as mst.</li><li>• <b>priority &lt;value(0-61440)&gt;</b> - Configures the priority value for the switch and for the MSTI, in RSTP and MSTP respectively. This value ranges between 0 and 61440. The value should be set in steps of 4096, that is, you can set the value as 0, 4096, 8192, 12288 and so on.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	priority - 32768
	<p>The priority value can be configured in the switch, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.</p> <p>This priority value configuration is not supported in PVRST Mode.</p>
<b>Example</b>	<pre>Your Product(config)#spanning-tree priority 4096</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>shutdown spanning-tree</b> - Shuts down spanning tree functionality in the switch.</li><li>• <b>spanning-tree Mode</b> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li></ul>

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- **show spanning-tree root** - Displays the spanning tree root information.
  - **show spanning-tree bridge** - Displays the spanning tree bridge information.
  - **show spanning-tree - Summary, Blockedports, Pathcost, redundancy** – Displays spanning tree related information available in the switch for the current STP enabled in the switch.
  - **show spanning-tree detail** - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.
  - **show spanning-tree active** - Displays spanning tree related information available in the switch for the current STP enabled in the switch.
  - **instance** - Creates an MST instance and maps it to VLANs.
  - **show spanning-tree mst - CIST or specified mst Instance** - Displays multiple spanning tree information for all MSTIs in the switch.
  - **show spanning-tree mst - Port Specific Configuration** - Displays multiple spanning tree port specific information for the specified port.
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## 16.1.10 spanning-tree auto-edge

<b>Command Objective</b>	<p>This command enables automatic detection of Edge port parameter of an interface.</p> <p>The no form of this command disables automatic detection of Edge port parameter of an interface. The automatic detection of Edge port parameter is disabled, even if the spanning tree Mode is changed.</p> <p>Once automatic detection is enabled, the Edge port parameter is automatically detected and set. The port is set as edge port, if no BPDU is received on the port. The port is set as non-edge port, if any BPDU is received.</p>
<b>Syntax</b>	<p><b>spanning-tree auto-edge</b></p> <p><b>no spanning-tree auto-edge</b></p>
<b>Mode</b>	Interface Configuration Mode (Physical Interface Mode)
<b>Default</b>	Automatic detection of Edge port parameter of an interface is enabled.
	The automatic detection of Edge port parameter can be configured in the switch, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.
<b>Example</b>	<b>Your Product(config-if)# spanning-tree auto-edge</b>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>shutdown spanning-tree</b> - Shuts down spanning tree functionality in the switch.</li><li>• <b>spanning-tree Mode</b> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li></ul>

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## 16.1.11 spanning-tree - Properties of an interface

### Command Objective

This command configures the port related spanning tree information for all kinds of STPs. This can be applied for any port, in RSTP/MSTP Mode. This command creates port in STP when Automatic Port Create feature is disabled.

The no form of this command resets the port related spanning tree information to its default value. The port related spanning tree information is changed to its default value even if the spanning tree Mode is changed. This command also deletes port in STP when Automatic Port Create feature is disabled.



In STP module, whenever a port is mapped to any context, the corresponding port is created irrespective of whether STP is intended to be enabled on that interface. This leads To STP scaling issues and this problem is solved by having control at STP module on the port entry creation at STP module itself.

### Syntax

```
spanning-tree [{cost <value(0-200000000)>|disable|link-type{point-to-point|shared}|portfast|port-priority <value(0-240)>}]
```

```
no spanning-tree [{cost |disable|link-type|portfast|port-priority}]
```

### Parameter Description

- **cost <value(0-200000000)>** - Configures the port's path cost value that contributes to the path cost of paths containing this particular port. The paths' path cost is used during calculation of shortest path to reach the root. The path cost represents the distance between the root port and designated port. This value ranges between 1 and 200000000. The configured path cost is used, even if the dynamic pathcost calculation feature or LAGG speed feature is enabled. This configuration is not supported for the spanning tree Mode pvrst.
- **disable** - Disables the spanning tree operation on the port. The port does not take part in the execution of spanning tree operation for preventing undesirable loops in the network.
- **link-type** - Configures the link status of the LAN segment attached to the port. The options available are:
  - **point-to-point** – The port is treated as if it is connected to a point-to-point link.
  - **shared** - The port is treated as if it is using a shared media connection.
- **portfast** - Configures the portfast feature in the port. This feature specifies that the port is connected to only one hosts and hence can rapidly transit to forwarding. This feature can cause temporary bridging loops, if hubs, concentrators, switches, bridges and so on are connected to this port. This feature takes effect only when the interface is shutdown.

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- **port-priority <value(0-240)>** - Configures the priority value assigned to the port. This value is used during port role selection process. This value ranges between 0 and 240. This value should be set in steps of 16, that is, you can set the value as 0, 16, 32, 48, and so on. This configuration is not supported for the spanning tree Mode pvrst.

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**Mode**

Interface Configuration Mode (Physical Interface Mode)

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**Default**

- **cost** - 200000 for all physical ports, 199999 for port channels
- **disable** - Spanning tree operation is enabled in the port.
- **link-type** - The port is considered to have a point-to-point link if:
  - It is an aggregator and all of its members can be aggregated.
  - The MAC entity is configured for full duplex operation, either manually or through auto negotiation process (that is, negotiation Mode is set as **Auto**)
  - Otherwise port is considered to have a shared media connection
- **portfast** - Portfast is disabled.
- **port-priority** - 128



The port-related spanning tree information can be configured, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.

This command executes without the optional parameters only if automatic port-create feature is disabled.

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**Example**

```
Your Product(config-if)# spanning-tree cost 2200

Your Product(config-if)# spanning-tree link-type point-to-point

Your Product(config-if)# spanning-tree portfast

Your Product(config-if)# spanning-tree port-priority 32

Your Product(config-if)# spanning-tree
```

---

**Related Command(s)**

- **automatic-port-create** - Enables or disables the Automatic Port Create feature.
- **shutdown spanning-tree** - Shuts down spanning tree functionality in the switch.
- **spanning-tree Mode** - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.


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- **spanning-tree pathcost dynamic** - Enables dynamic pathcost calculation feature in the switch.
  - **show spanning-tree - Summary, Blockedports, Pathcost, redundancy** - Displays spanning tree related information available in the switch for the current STP enabled in the switch.
  - **show spanning-tree detail** - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.
  - **show spanning-tree active** - Displays spanning tree related information available in the switch for the current STP enabled in the switch.
  - **show spanning-tree interface** - Displays the port related spanning tree information for the specified interface.
  - **show spanning-tree root** - Displays the spanning tree root information.
  - **show spanning-tree mst - CIST or specified mst Instance** - Displays multiple spanning tree information for all MSTIs in the switch.
  - **show spanning-tree mst - Port Specific Configuration** - Displays multiple spanning tree port specific information for the specified port.
  - **show spanning-tree vlan - Summary, Blockedports, Pathcost** - Displays PVRST related information for the specified VLAN.
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## 16.1.12 spanning-tree portfast - disable | trunk

<b>Command Objective</b>	This command configures the portfast Mode, where the interface is immediately put into the forwarding state upon linkup without waiting for the timer to expire.
	<p>This command is a standardized implementation of the existing command; <b>spanning-tree - Properties of an interface</b>. It operates similar to the existing command.</p> <p>The spanning-tree portfast feature is currently not supported in the Global Configuration Mode.</p>
<b>Syntax</b>	<code>spanning-tree portfast { disable   trunk }</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>disable</b> - Disables PortFast Mode</li><li>• <b>trunk</b> - Enables PortFast Mode</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Example</b>	<code>Your Product(config)# spanning-tree portfast trunk</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>spanning-tree Mode -pvrst</b> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li><li>• <b>show spanning-tree interface</b> - Displays the spanning tree port specific configuration.</li></ul>

## 16.1.13 spanning-tree portfast - bpdufilter default | bpduguarddefault | default


<b>Command Objective</b>	This command configures the portfast of the non-trunk ports as bpdufilter default or bpduguard default or default. This is used only for Trunk ports.
	<p>This command is a standardized implementation of the existing command; <b>spanning-tree - Properties of an interface</b>. It operates similar to the existing command.</p> <p>The spanning-tree portfast feature is currently not supported in the Global Configuration Mode.</p>
<b>Syntax</b>	<pre>spanning-tree portfast {bpdufilter default   bpduguard default   default}  no spanning-tree portfast {bpdufilter default   bpduguard default   default}</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>bpdufilter default</b> - Enables BPDU filtering on all PortFast ports.</li><li>• <b>bpduguard default</b> - Enables BPDU guard feature on all PortFast ports.</li><li>• <b>default</b> - Enables PortFast by default on all access ports.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Example</b>	<pre>Your Product(config)# spanning-tree portfast default</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>spanning-tree Mode</b> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li><li>• <b>show spanning-tree interface</b> - Displays the spanning tree port specific configuration.</li></ul>



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## 16.1.14 spanning-tree restricted-role

<b>Command Objective</b>	<p>This command enables the restricted role feature for a port.</p> <p>The restricted role feature blocks the port from being selected as a root port even if it has the best spanning tree priority vector. This port is selected as an alternate port after the root port is selected. This feature allows you to block switches external to a core region of the network from influencing the spanning tree active topology.</p> <p>The blocking of port from being selected as a root port can cause lack of spanning tree connectivity.</p> <p>The no form of this command disables the restricted role feature in the port. The restricted role feature is disabled, even if the spanning tree Mode is changed or port is set as L2GP.</p>
<b>Syntax</b>	<p><b>spanning-tree restricted-role</b></p> <p><b>no spanning-tree restricted-role</b></p>
<b>Mode</b>	Interface Configuration Mode (Physical Interface Mode)
<b>Default</b>	Restricted role feature is disabled in all ports.
	<p>The restricted role feature can be configured, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.</p> <p>This configuration is not supported in PVRST Mode.</p>
<b>Example</b>	<pre>Your Product(config-if)# spanning-tree restricted-role</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>shutdown spanning-tree</b> - Shuts down spanning tree functionality in the switch.</li><li>• <b>spanning-tree Mode</b> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li><li>• <b>spanning-tree layer2-gateway-port</b> - Configures a port to operate as a L2GP.</li><li>• <b>show spanning-tree detail</b> - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.</li></ul>

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- **show spanning-tree active detail** - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.
  - **show spanning-tree interface** - Displays the port related spanning tree information for the specified interface.
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## 16.1.15 spanning-tree restricted-tcn

<b>Command Objective</b>	<p>This command enables the topology change guard / restricted TCN feature on a port.</p> <p>The restricted TCN feature blocks the port from propagating the received topology change notifications and topology changes to other ports. This feature allows you to block switches external to a core region of the network from causing address flushing in the region.</p> <p>The blocking of port can cause temporary loss of connectivity after changes in a spanning tree active topology as a result of persistent incorrectly learnt station location information.</p> <p>The no form of this command disables the topology change guard / restricted TCN feature on the port. The topology change guard / restricted TCN feature is disabled, even if the spanning tree Mode is changed or port is set as L2GP.</p>
<b>Syntax</b>	<pre>spanning-tree restricted-tcn</pre> <pre>no spanning-tree restricted-tcn</pre>
<b>Mode</b>	Interface Configuration Mode (Physical Interface Mode)
<b>Default</b>	Topology change guard / restricted TCN feature is disabled in all ports..
	<p>The topology change guard / restricted TCN feature can be configured, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.</p> <p>This configuration is not supported in PVRST Mode.</p>
<b>Example</b>	<pre>Your Product(config-if)# spanning-tree restricted-tcn</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>shutdown spanning-tree</code> - Shuts down spanning tree functionality in the switch.</li><li>• <code>spanning-tree Mode</code> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li><li>• <code>spanning-tree layer2-gateway-port</code> - Configures a port to operate as a L2GP.</li><li>• <code>show spanning-tree detail</code> - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.</li></ul>


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- **show spanning-tree active detail** - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.
  - **show spanning-tree interface** - Displays the port related spanning tree information for the specified interface.
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## 16.1.16 spanning-tree layer2-gateway-port

<b>Command Objective</b>	<p>This command configures a port to operate as a L2GP.</p> <p>L2GP operates similar to that of the normal port operation but pretends to continuously receive BPDUs when admin state of the port is Up.</p> <p>The no form of this command configures the port to operate as a normal port. The port operates as normal port, even if the spanning tree Mode is changed.</p>
<b>Syntax</b>	<pre>spanning-tree layer2-gateway-port</pre> <pre>no spanning-tree layer2-gateway-port</pre>
<b>Mode</b>	Interface Configuration Mode (Physical Interface Mode)
<b>Default</b>	The port operates as a normal port.
	<ul style="list-style-type: none"><li>• The port can be configured as L2GP, only if the BPDU transmit status, restricted role feature and restricted TCN feature of the port are disabled.</li><li>• The PIP or CBP ports cannot be set as L2GP.</li><li>• Ports with SISP enabled interfaces cannot be set as L2GP.</li><li>• The port state of the L2GP is always set as discarding.</li><li>• The topology change guard / restricted TCN feature can be configured, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.</li></ul>
<b>Example</b>	<pre>Your Product(config-if)# spanning-tree layer2-gateway-port</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>shutdown spanning-tree</b> - Shuts down spanning tree functionality in the switch.</li><li>• <b>spanning-tree Mode</b> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li><li>• <b>spanning-tree restricted-role</b> - Enables the restricted role feature for a port.</li><li>• <b>spanning-tree restricted-tcn</b> - Enables the topology change guard / restricted TCN feature on a port.</li></ul>


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- **spanning-tree bpdu-transmit** - Configures the BPDU transmission status of a port.
  - **show spanning-tree - Summary, Blockedports, Pathcost, redundancy** - Displays spanning tree related information available in the switch for the current STP enabled in the switch.
  - **show spanning-tree detail** – Displays detailed spanning tree related information of the switch and all ports enabled in the switch.
  - **show spanning-tree active detail** - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.
  - **show spanning-tree interface** - Displays the port related spanning tree information for the specified interface.
  - **show spanning-tree - layer 2 gateway port** - Displays spanning tree information for all L2GPs enabled in the switch.
  - **show spanning-tree mst - CIST or specified mst Instance** - Displays multiple spanning tree information for all MSTIs in the switch.
  - **show spanning-tree mst - Port Specific Configuration** - Displays multiple spanning tree port specific information for the specified port.
  - **show spanning-tree vlan - Summary, Blockedports, Pathcost** - Displays PVRST related information for the specified VLAN.
  - **show spanning-tree vlan - interface** - Displays interface specific PVRST information for the specified VLAN.
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## 16.1.17 spanning-tree bpdureceive

<b>Command Objective</b>	<p>This command configures the processing status of the BPDUs received in a port. BPDUs are used to carry bridge related information that is used during spanning tree operation.</p> <p>The processing status is reset to its default value, once the spanning tree Mode is changed.</p>
<b>Syntax</b>	<code>spanning-tree bpdureceive {enabled   disabled}</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>enabled</b> - Allows normal processing of BPDUs received on the port.</li><li>• <b>disabled</b> - Discards the BPDUs received on the port.</li></ul>
<b>Mode</b>	Interface configuration Mode (Physical Interface Mode)
<b>Default</b>	enabled
	The processing status of the received BPDUs can be configured, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.
<b>Example</b>	<pre>Your Product(config-if)# spanning-tree bpdureceive disabled</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>shutdown spanning-tree</b> - Shuts down spanning tree functionality in the switch.</li><li>• <b>spanning-tree Mode</b> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li><li>• <b>show spanning-tree detail</b> - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.</li><li>• <b>show spanning-tree active detail</b> - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.</li><li>• <b>show spanning-tree interface</b> - Displays the port related spanning tree information for the specified interface.</li></ul>

## 16.1.18 spanning-tree bpdutransmit


<b>Command Objective</b>	<p>This command configures the BPDU transmission status of a port. BPDUs are used to carry bridge related information that is used during spanning tree operation.</p> <p>The transmission status is reset to its default value, once the spanning tree Mode is changed.</p>
<b>Syntax</b>	<code>spanning-tree bpdutransmit {enabled   disabled}</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>enabled</b> - Allows the transmission of BPDUs from the port.</li><li>• <b>disabled</b> - Blocks the transmission of BPDUs from the port.</li></ul>
<b>Mode</b>	Interface configuration Mode (Physical Interface Mode)
<b>Default</b>	enabled
	<ul style="list-style-type: none"><li>• BPDU transmission status cannot be enabled on the port that is configured as L2GP.</li><li>• The BPDU transmission status can be configured, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.</li></ul>
<b>Example</b>	<pre>Your Product(config-if)# spanning-tree bpdutransmit enabled</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>shutdown spanning-tree</code> - Shuts down spanning tree functionality in the switch.</li><li>• <code>spanning-tree Mode</code> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li><li>• <code>spanning-tree layer2-gateway-port</code> - Configures a port to operate as a L2GP.</li><li>• <code>show spanning-tree detail</code> - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.</li><li>• <code>show spanning-tree active detail</code> - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.</li><li>• <code>show spanning-tree interface</code> - Displays the port related spanning tree information for the specified interface.</li></ul>




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## 16.1.19 spanning-tree loop-guard

<b>Command Objective</b>	<p>This command enables the loop guard feature in a port.</p> <p>This feature prevents the alternative or root ports from becoming designated ports due to failure in a unidirectional link. This feature is useful when the neighbor bridge is faulty, that is, the bridge cannot send BPDUs but continues to send data traffic.</p> <p>The no form of this command disables the loop guard feature in the port. The loop guard feature is disabled, even if the spanning tree Mode is changed.</p>
<b>Syntax</b>	<p><b>spanning-tree loop-guard</b></p> <p><b>no spanning-tree loop-guard</b></p>
<b>Mode</b>	Interface Configuration Mode (Physical Interface Mode)
<b>Package</b>	Workgroup, Enterprise Metro_E and Metro
	The loop guard feature can be configured, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.
<b>Example</b>	<pre>Your Product(config-if)# spanning-tree loop-guard</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>shutdown spanning-tree</b> - Shuts down spanning tree functionality in the switch.</li><li>• <b>spanning-tree Mode</b> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li><li>• <b>show spanning-tree detail</b> - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.</li><li>• <b>show spanning-tree active detail</b> - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.</li><li>• <b>show spanning-tree interface</b> - Displays the port related spanning tree information for the specified interface.</li></ul>

## 16.1.20 spanning-tree – Pseudoroot configuration

<b>Command Objective</b>	<p>This command configures the pseudoroot related information for a port set as L2GP.</p> <p>The information contains pseudoroot priority and pseudoroot MAC address for the port. This configuration is not utilized in PVRST Mode.</p> <p>The no form of this command resets the pseudoroot related information to the currently available bridge related information.</p>
<b>Syntax</b>	<pre>spanning-tree [mst &lt;instance-id&gt;] pseudoRootId priority &lt;value(0-61440)&gt; mac-address &lt;ucast_mac&gt;</pre> <pre>no spanning-tree [mst &lt;instance-id(1-64)&gt;] pseudoRootId</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>mst &lt;instance-id&gt;/ mst &lt;instance-id(1-64)&gt;</b> - Configures the ID of MSTP instance already created in the switch. This value ranges between 1 and 64. The special value 4094 can be used only in the switch that supports PBB-TE. This special value represents PTETID that identifies VID used by ESPs. This option is applicable, only if the spanning tree Mode is set as mst.</li> <li>• <b>priority &lt;value(0-61440)&gt;</b> - Configures the priority of the pseudoroot. Port configured as L2GP uses this value in generated BPDUs as the root identifier. This value ranges between 0 and 61440. The value should be set in steps of 4096, that is, you can set the value as 0, 4096, 8192, 12288 and so on.</li> <li>• <b>mac-address</b> - Configures the unicast MAC address of the pseudoroot. Port configured as L2GP uses this value as its address.</li> </ul>
<b>Mode</b>	Interface configuration Mode (Physical Interface Mode)
<b>Default</b>	<ul style="list-style-type: none"> <li>• priority - Priority value assigned to the switch.</li> <li>• mac-address - MAC address assigned to the switch.</li> </ul>
	<p>The pseudoroot related information can be configured, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.</p>
<b>Example</b>	<pre>Your Product(config-if)# spanning-tree mst 1 pseudoRootId priority 8192 mac-address 00:00:12:34:45:55</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li>• <b>shutdown spanning-tree</b> - Shuts down spanning tree functionality in the switch.</li> </ul>

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- **spanning-tree Mode** - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.
  - **show spanning-tree detail** - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.
  - **show spanning-tree active detail** - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.
  - **show spanning-tree interface** – Displays the port related spanning tree information for the specified interface.
  - **show spanning-tree - layer 2 gateway port** - Displays spanning tree information for all L2GPs enabled in the switch.
  - **instance** - Creates an MST instance and maps it to VLANs.
  - **show spanning-tree mst - CIST or specified mst Instance** - Displays multiple spanning tree information for all MSTIs in the switch.
  - **show spanning-tree mst - Port Specific Configuration** – Displays multiple spanning tree port specific information for the specified port.
  - **show spanning-tree vlan - Summary, Blockedports, Pathcost** - Displays PVRST related information for the specified VLAN.
  - **show spanning-tree vlan - interface** - Displays interface specific PVRST information for the specified VLAN.
-

## 16.1.21 debug spanning-tree


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<b>Command Objective</b>	<p>This command enables the tracing of the STP module as per the configured debug levels. The trace statements are generated for the configured trace levels.</p> <p>This command allows combination of debug levels to be configured (that is, more than one level of trace can be enabled or disabled). The debug levels are configured one after the other and not in single execution of the command.</p> <p>The no form of this command disables the tracing of the STP module as per the configured debug levels. The trace statements are not generated for the configured trace levels.</p>
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<b>Syntax</b>	<pre>debug spanning-tree { global   all   [errors] [init-shut] [management] [memory] [bpdu] [events] [timer] [port-info- state-machine] [port-recieve-state-machine] [port-role- selection-state-machine] [role-transition-state-machine] [state-transition-state-machine] [protocol-migration- state-machine] [topology-change-state-machine] [port- transmit-state-machine] [bridge-detection-state-machine] [pseudoInfo-state-machine] [redundancy] [sem-variables] [switch &lt;context_name&gt;]}  no debug spanning-tree {global   {all   errors   init-shut   management   memory   bpdu  events   timer   state- machine {port-info   port-receive   port-role-selection   role-transition   state-transition   protocol-migration   topology-change   port-transmit   bridge-detection   pseudoInfo } redundancy   sem-variables} [switch &lt;context_name&gt;]}</pre>
---------------	--

---

<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>global</b> - Generates debug statements for global traces. This trace is used for providing status of STP task initialization, memory-pool creation and event-reception in STP task.  This parameter is specific to Multiple Instance.</li><li>• <b>all</b> - Generates debug statements for all kinds of traces.</li><li>• <b>errors</b> - Generates debug statements for all failure traces.</li><li>• <b>init-shut</b> - Generates debug statements for init and shutdown traces. This trace is generated on failed and successful initialization and shutting down of STP related module and memory.</li><li>• <b>management</b> - Generates debug statements for management traces. This trace is generated whenever you configure any of the STP features.</li><li>• <b>memory</b> - Generates debug statements for memory related traces. This</li></ul>
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trace is generated on failed and successful allocation of memory for STP process.

- **bpdu** - Generates debug statements for BPDU related traces. This trace is generated on failed and successful reception, transmission and processing of BPDUs.
  - **events** - Generates debug statements for event handling traces. This trace is generated to denote events that are posted to STP configuration queue whenever you configure any of the STP features.
  - **timer** - Generates debug statements for timer module traces. This trace is generated on failed and successful start, stop and restart of STP timers.
  - **port-info-state-machine** - Generates debug statements for port information SEM.
  - **port-recv-state-machine** - Generates debug statements for port receive SEM.
  - **port-role-selection-state-machine** - Generates debug statements for role selection SEM.
  - **role-transition-state-machine** - Generates debug statements for role transition SEM.
  - **state-transition-state-machine** - Generates debug statements for state transition SEM.
  - **protocol-migration-state-machine** - Generates debug statements for protocol migration SEM.
  - **topology-change-state-machine** - Generates debug statements for topology change SEM.
  - **port-transmit-state-machine** - Generates debug statements for port transmit SEM.
  - **bridge-detection-state-machine** - Generates debug statements for bridge detection SEM.
  - **pseudoInfo-state-machine** - Generates debug statements for port receive pseudo information SEM.
  - **state machine** - Generates debug statements to denote the event and state of the selected SEM. The options are:
    - **port-info** - Generates debug statements for port information SEM.
    - **port-receive** - Generates debug statements for port receive SEM.
    - **port-role-selection** - Generates debug statements for role selection SEM.
    - **role-transition** - Generates debug statements for role transition SEM.
-

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- **state-transition** - Generates debug statements for state transition SEM.
  - **protocol-migration** - Generates debug statements for protocol migration SEM.
  - **topology-change** - Generates debug statements for topology change SEM.
  - **port-transmit** - Generates debug statements for port transmit SEM.
  - **bridge-detection** - Generates debug statements for bridge detection SEM.
  - **pseudoInfo** - Generates debug statements for port receive pseudo information SEM.
- **redundancy** - Generates debug statements for redundancy code flow traces. This trace is generated in standby node STP while taking backup of configuration information from active node.
  - **sem-variables** - Generates debug statements for state machine variable changes traces. This trace is generated on failed and successful creation and deletion of semaphore.
  - **switch<context\_name>** - Configures the tracing of the STP module for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.

---

<b>Mode</b>	Privileged EXEC Mode
<b>Default</b>	Tracing of the STP module is disabled
<b>Example</b>	<b>Your Product# debug spanning-tree all</b>

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## 16.1.22 clear spanning-tree detected protocols

<b>Command Objective</b>	This command restarts the protocol migration process on all interfaces in the switch and forces renegotiation with the neighboring switches.
<b>Syntax</b>	<code>clear spanning-tree detected protocols [{interface &lt;interface-type&gt; &lt;interface-id&gt;   switch &lt;context_name&gt;}]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>interface &lt;interface-type&gt; &lt;interface-id&gt;</b> - Restarts the protocol migration process on the specified interface. The details to be provided are:<ul style="list-style-type: none"><li>- <b>&lt;interface-type&gt;</b> - Sets the type of interface. The interface can be:<ul style="list-style-type: none"><li>▪ qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.</li><li>▪ gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.</li><li>▪ extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.</li><li>▪ port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.</li></ul></li><li>- <b>&lt;interface-id&gt;</b> - Sets the interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface types port-channel.</li></ul></li><li>• <b>switch &lt;context_name&gt;</b> - Restarts the protocol migration process for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# clear spanning-tree detected protocols interface gigabitethernet 0/1</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>show spanning-tree interface</b> - Displays the port related spanning tree information for the specified interface.</li></ul>

## 16.1.23 show spanning-tree - Summary, Blockedports, Pathcost, Redundancy

<b>Command Objective</b>	<p>This command displays spanning tree related information available in the switch for the current STP enabled in the switch.</p> <p>The information contain priority, address and timer details for root and bridge, status of dynamic pathcost calculation feature, status of spanning tree function, STP compatibility version used, configured spanning tree Mode, bridge and port level spanning tree statistics information, and details of ports enabled in the switch. The port details contain port ID, port role, port state, port cost, port priority and link type.</p>
<b>Syntax</b>	<pre>show spanning-tree [{ summary   blockedports   pathcost method   redundancy }] [ switch &lt;context_name&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>summary</b> - Displays the currently used STP, applied path cost method and port details such as port ID, port role, port state and port status. This option cannot be executed in the PVRST Mode.</li><li>• <b>blockedports</b> - Displays the list of ports in blocked state and the total number of blocked ports. This option cannot be executed in the PVRST Mode.</li><li>• <b>pathcost method</b> - Displays the port pathcost method configured for the switch.</li><li>• <b>redundancy</b> - Displays the port role and port state, and dumps the STP port related information.</li><li>• <b>switch &lt;context_name&gt;</b> - Displays the STP related information in the switch, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
	This command can be executed successfully, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.
<b>Example</b>	<p><b>Single Instance:</b></p> <pre>Your Product# show spanning-tree Root Id          Priority 32768 Address 00:01:02:03:04:01 Cost 0</pre>



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Port 0 [0]

This bridge is the root

Max age 20 Sec 0 cs, forward delay 15 Sec 0 cs

Hello Time 2 sec 0 cs

MST00

Spanning tree Protocol has been enabled

MST00 is executing the mstp compatible Multiple Spanning Tree Protocol

Bridge Id            Priority 32768

Address 00:01:02:03:04:01

Max age is 20 sec, forward delay is 15 sec

Dynamic Path Cost is Disabled

Name	Role	State	Cost	Prio	Type
----	----	-----	----	----	-----
Gi0/1	Designated	Forwarding	200000	128	SharedLan
Gi0/2	Designated	Forwarding	200000	128	SharedLan
Gi0/3	Designated	Forwarding	200000	128	SharedLan
Gi0/4	Designated	Forwarding	200000	128	SharedLan
Gi0/5	Designated	Forwarding	200000	128	SharedLan
Gi0/6	Designated	Forwarding	200000	128	SharedLan
Gi0/7	Designated	Forwarding	200000	128	SharedLan

**Your Product# show spanning-tree blockedports**

Blocked Interfaces List:

The Number of Blocked Ports in the system is :1

**Your Product# show spanning-tree pathcost method**

Spanning Tree port pathcost method is Long

**Your Product# show spanning-tree summary**

Spanning tree enabled protocol is RSTP

Spanning Tree port pathcost method is Long

RSTP Port Roles and States

Port-Index	Port-Role	Port-State	Port-Status
-----	-----	-----	-----
1	Designated	Forwarding	Enabled
2	Designated	Forwarding	Enabled
3	Designated	Forwarding	Enabled
4	Designated	Forwarding	Enabled
5	Designated	Forwarding	Enabled

---

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```
6          Designated   Forwarding   Enabled
7          Designated   Forwarding   Enabled
8          Designated   Forwarding   Enabled
```

**Your Product# show spanning-tree redundancy**

Port Role/State for Instance 0 Port 1

=====

Port Role 3 Port State 5

Port Role/State for Instance 0 Port 2

=====

Port Role 1 Port State 2

Dumping Data On Port 1

-----

RootId 0:00:11:22:33:44:55

Designated BrId 0:00:11:22:33:44:55

Root path Cost 0

Length 0

Protocol Id 0

Port Id 8001

Message Age 0

Max Age 14

Hello Time 2

Fwd Delay Time 15

Dest Addr 00:00:00:00:00:00

Src Addr 00:00:00:00:00:00

Version Length 0

Version 2

BPDU Type 2

Flags e

Dumping Data On Port 2

-----

RootId 0:00:11:22:33:44:55

Designated BrId 0:00:11:22:33:44:55

Root path Cost 0

Length 0

Protocol Id 0

Port Id 8002

Message Age 0

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```
Max Age 14
Hello Time 2
Fwd Delay Time 15
Dest Addr 00:00:00:00:00:00
Src Addr 00:00:00:00:00:00
Version Length 0
Version 2
BPDU Type 2
Flags e
Instance 0 Port 1
=====
Expected FdWile expiry time 0
Expected rcvdInfo exp Time 4654
Expected rrWhile exp Time 0
Expected rbWhile exp Time 0
Expected tcWhile exp Time 0
Instance 0 Port 1
TCN Var 1
STP Version 1
Proposing Flag 0
Info Is 4
Instance 0 Port 2
=====
Expected FdWile expiry time 0
Expected rcvdInfo exp Time 4656
Expected rrWhile exp Time 0
Expected rbWhile exp Time 0
Expected tcWhile exp Time 0
Instance 0 Port 2
TCN Var 1
STP Version 1
Proposing Flag 0
Info Is 4
```

Multiple Instance:

For RSTP

**Your Product# show spanning-tree**

---

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Switch default

We are the root of the Spanning Tree

```
Root Id      Priority  32768
             Address  00:05:02:03:04:01
             Cost    0
             Port    0
             Max Age 20 sec 0 cs, Forward Delay 15 sec 0 cs
```

Bridge is executing the rstp compatible Rapid Spanning Tree Protocol

```
Bridge Id      Priority 32768
              Address 00:05:02:03:04:01
              Hello Time 1 sec 58 cs, Max Age 20 sec 0 cs
              Forward Delay 15 sec 0 cs
              Dynamic Path Cost is Disabled
              Dynamic Path Cost Lag-Speed Change is
```

Disabled

Name	Role	State	Cost	Prio	Type
----	----	-----	----	----	-----

For MSTP

**Your Product# show spanning-tree**

Switch default

```
Root Id      Priority  32768
             Address  00:01:02:03:04:01
             Cost    0
             Port    0 [0]
             This bridge is the root
             Max age 20 Sec 0 cs, forward delay 15 Sec 0 cs
             Hello Time is 2 sec 0 cs
```

MST00

Spanning tree Protocol Enabled.

S-VLAN Component: MST00 is executing the mstp compatible Multiple Spanning Tree

Protocol

```
Bridge Id      Priority 32768
              Address 00:01:02:03:04:01
              Max age 20 Sec 0 cs, forward delay 15 Sec 0 cs
```

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---

```
                Hello Time is 2 sec 0 cs
Name           Role           State           Cost           Prio    Type
-----
Gi0/1         Disabled        Discarding      200000         128     SharedLan
Gi0/2         Designated      Forwarding      200000         128     SharedLan
Gi0/3         Designated      Forwarding      200000         128     SharedLan
Gi0/4         Designated      Forwarding      200000         128     SharedLan
Gi0/5         Designated      Forwarding      200000         128     SharedLan
Gi0/6         Designated      Forwarding      200000         128     SharedLan
Gi0/7         Designated      Forwarding      200000         128     SharedLan
```

**Your Product# show spanning-tree summary**

Switch - default

Spanning Tree port pathcost method is Long

Spanning tree enabled protocol is MSTP

MST00 Port Roles and States

Port-Index	Port-Role	Port-State	Port-Status
49	Disabled	Forwarding	Disabled

Switch - cust1

Spanning Tree port pathcost method is Long

Spanning tree enabled protocol is MSTP

MST00 Port Roles and States

Port-Index	Port-Role	Port-State	Port-Status
1	Designated	Forwarding	Enabled
2	Root	Forwarding	Enabled
3	Designated	Forwarding	Enabled
4	Disabled	Discarding	Enabled
5	Disabled	Discarding	Enabled
6	Disabled	Discarding	Enabled

Switch - cust2

Spanning Tree port pathcost method is Long

Spanning tree enabled protocol is MSTP

MST00 Port Roles and States

Port-Index	Port-Role	Port-State	Port-Status
7	Designated	Forwarding	Enabled

---

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---

8	Root	Forwarding	Enabled
9	Alternate	Discarding	Enabled
10	Disabled	Discarding	Enabled
11	Disabled	Discarding	Enabled
12	Disabled	Discarding	Enabled

---

## Related Command(s)


- **shutdown - physical/VLAN/port-channel/tunnel Interface -** Disables a physical interface / VLAN interface / port-channel interface / tunnel interface / OOB interface.
- **shutdown spanning-tree -** Shuts down spanning tree functionality in the switch.
- **spanning-tree -** Enables the spanning tree operation in the switch for the selected spanning tree Mode.
- **spanning-tree Mode -** Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.
- **spanning-tree compatibility -** Sets the STP compatibility version in the switch for all ports.
- **spanning-tree timers -** Sets the spanning tree timers such as hello time, that are used for controlling the transmission of BPDUs during the computation of loop free topology.
- **spanning-tree pathcost dynamic -** Enables dynamic pathcost calculation feature in the switch.
- **spanning-tree priority -** Configures the priority value that is assigned to the switch.
- **spanning-tree - Properties of an interface -** Configures the port related spanning tree information for all kinds of STPs and creates port in STP when Automatic Port Create feature is disabled.
- **spanning-tree layer2-gateway-port -** Configures a port to operate as a L2GP.
- **spanning-tree mst- Properties of an interface for MSTP -** Configures the port related spanning tree information for a specified MSTI.
- **spanning-tree mst hello-time -** Configures the hello time for an interface that is enabled.
- **spanning-tree vlan -** Configures spanning tree related information on a per VLAN basis.
- **spanning-tree vlan status -** Configures the status of PVRST on a port for the specified VLAN.

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- **spanning-tree vlan port-priority** - Configures the priority of a port for the specified VLAN.
  - **spanning-tree vlan cost** - Configures the cost of a port for the specified VLAN.
-

## 16.1.24 show spanning-tree detail

<b>Command Objective</b>	<p>This command displays detailed spanning tree related information of the switch and all ports enabled in the switch.</p> <p>The information contains status of spanning tree operation, current selected spanning Mode, current spanning tree compatibility version, bridge and root priority, bridge and root addresses, port path cost, port priority, port timers, bridge and port level spanning tree statistics information, transmit hold-count value, link-type, and status of L2GP, loop guard, BPDU receive, BPDU transmit, restricted TCN, restricted role and portfast features.</p>
<b>Syntax</b>	<pre>show spanning-tree detail [ switch &lt;context_name&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li><b>switch &lt;context_name&gt;</b> - Displays detailed spanning tree related information, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
	This command can be executed successfully, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.
<b>Example</b>	<p>Single Instance</p> <pre>Your Product# show spanning-tree detail Spanning tree Protocol Enabled. Bridge is executing the rstp compatible Spanning Tree Protocol Bridge Identifier has priority 32768, Address 00:01:02:03:04:01 Configured Hello time 2 sec 0 cs, Max Age 20 sec 0 cs, Forward Delay 15 sec 0 cs Dynamic Path Cost Disabled We are the root of the spanning tree Number of Topology Changes 0 Time since topology Change 0 seconds ago Transmit Hold-Count 6 Root Times:Max Age 20 sec 0 cs Forward Delay 15 sec 0 cs Hello Time 2 sec 0 cs</pre>



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---

```
Port 1 [Gi0/1] is Designated, Discarding
Port PathCost 200000, Port Priority 128, Port Identifier
128.1
Designated Root has priority 32768, address
00:01:02:03:04:01
Designated Bridge has priority 32768, address
00:01:02:03:04:01
Designated Port Id is 128.1, Designated PathCost 0
No of Transitions to forwarding State :0
PortFast is disabled
Link Type is Shared
BPDUs : sent 3 , recieved 0
Timers: Hello - 1, Forward Delay - 14, Topology Change - 0

Restricted Role is disabled.
Restricted TCN is disabled.
bpdu-transmit enabled
bpdu-receive enabled

Multiple Instance:

Your Product# show spanning-tree detail switch default
Switch default
MST00 is executing the mstp compatible Multiple Spanning
Tree Protocol
Bridge Identifier has Priority 32768, Address
00:51:02:03:04:05
Configured Max age 20 sec 0 cs, Forward delay 15 sec 0 cs
Configured Hello Time 2 sec 0 cs
Dynamic Path Cost Disabled
Flush Interval 0 centi-sec, Flush Invocations 1
Flush Indication threshold 0
We are root of the spanning tree
Current Root has priority 32768, address
00:51:02:03:04:05
cost of root path is 0
Number of Topology Changes 1, Time since topology Change
82 seconds ago
Transmit Hold-Count 3
Root Times: Max age 20 sec 0 cs Forward delay 15 sec 0 cs
```

---

```
Port 1 [Gi0/1] of MST00 is Designated, Forwarding
Gi0/1 is operating in the MSTP Mode
Port path cost 200000, Port priority 128,
Port Identifier 128.1. Port HelloTime 2 secs 0 cs,
Timers: Hello - 0, Forward Delay - 0, Topology Change - 0

Designated root has priority 32768, address
00:51:02:03:04:05

Designated Bridge has priority 32768, address
00:51:02:03:04:05

Designated Port Id is 128.1, Designated pathcost is 0
Operational Forward delay 15 sec 0 cs, Max age 20 sec 0 cs
Number of Transitions to forwarding State : 1
PortFast is disabled
Link Type is Shared
BPDUs : sent 58, recieved 0
Restricted Role is disabled.
Restricted TCN is disabled.
```

---

## Related Command(s)

- **shutdown - physical/VLAN/port-channel/tunnel Interface** - Disables a physical interface / VLAN interface / port-channel interface / tunnel interface / OOB interface.
  - **shutdown spanning-tree** - Shuts down spanning tree functionality in the switch.
  - **spanning-tree** - Enables the spanning tree operation in the switch for the selected spanning tree Mode.
  - **spanning-tree Mode** - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.
  - **spanning-tree compatibility** - Sets the STP compatibility version in the switch for all ports.
  - **spanning-tree timers** - Sets the spanning tree timers such as hello time, that are used for controlling the transmission of BPDUs during the computation of loop free topology.
  - **spanning-tree transmit hold-count** - Sets the transmit hold-count value for the switch.
  - **clear spanning-tree counters** - Deletes all bridge and port level spanning tree statistics information.
-


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- **spanning-tree pathcost dynamic** - Enables dynamic pathcost calculation feature in the switch.
- **spanning-tree priority** - Configures the priority value that is assigned to the switch.
- **spanning-tree - Properties of an interface** - Configures the port related spanning tree information for all kinds of STPs and creates port in STP when Automatic Port Create feature is disabled.
- **spanning-tree restricted-role** - Enables the restricted role feature for a port.
- **spanning-tree restricted-tcn** - Enables the topology change guard / restricted TCN feature on a port.
- **spanning-tree layer2-gateway-port** - Configures a port to operate as a L2GP.
- **spanning-tree bpdu-receive** - Configures the processing status of the BPDUs received in a port.
- **spanning-tree bpdu-transmit** - Configures the BPDU transmission status of a port.
- **spanning-tree loop-guard** - Enables the loop guard feature in a port.
- **spanning-tree - Pseudoroot configuration** - Configures the pseudoroot related information for a port set as L2GP.
- **spanning-tree mst- Properties of an interface for MSTP** - Configures the port related spanning tree information for a specified MSTI.
- **spanning-tree mst hello-time** - Configures the hello time for an interface that is enabled.
- **spanning-tree vlan** - Configures spanning tree related information on a per VLAN basis.
- **spanning-tree vlan status** - Configures the status of PVRST on a port for the specified VLAN.
- **spanning-tree vlan port-priority** - Configures the priority of a port for the specified VLAN.
- **spanning-tree vlan cost** - Configures the cost of a port for the specified VLAN.
- **spanning-tree flush-interval** - Configures the flush interval timer value.
- **spanning-tree flush-indication-threshold** - Configures the flush indication threshold value for a specific instance.

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## 16.1.25 show spanning-tree active

<b>Command Objective</b>	<p>This command displays spanning tree related information available in the switch for the current STP enabled in the switch.</p> <p>The information contains priority, address and timer details for root and bridge, status of dynamic pathcost calculation feature, status of spanning tree function, STP compatibility version used, configured spanning tree Mode, bridge and port level spanning tree statistics information, and details of ports enabled in the switch. The port details contain port ID, port role, port state, port cost, port priority and link type.</p>
<b>Syntax</b>	<pre>show spanning-tree active [detail] [ switch &lt;context_name&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li><b>detail</b> - Displays detailed spanning tree related information of the switch and all ports enabled in the switch. The information contains status of spanning tree operation, current selected spanning Mode, current spanning tree compatibility version, bridge and root priority, bridge and root addresses, port path cost, port priority, port timers, bridge and port level spanning tree statistics information, transmit hold-count value, link-type, and status of L2GP, loop guard, BPDU receive, BPDU transmit, restricted TCN, restricted role and portfast features.</li><li><b>switch &lt;context_name&gt;</b> - Displays spanning tree related information available in the switch, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
	This command can be executed successfully, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.
<b>Example</b>	<p><b>Single Instance:</b></p> <pre>Your Product# show spanning-tree active Root Id      Priority    32768               Address    00:01:02:03:04:01               Cost      200000               Port      1 [Gi0/1]               Max age 20 sec 0 cs, forward delay 15 sec 0 cs               Hello Time 2 sec 0 cs  MST00 Spanning tree Protocol has been enabled</pre>

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```
MST00 is executing the mstp compatible Multiple Spanning
Tree Protocol
```

```
Bridge Id   Priority 32768
           Address 00:02:02:03:04:01
           Max age 20 sec 0 cs, forward delay 15 sec 0 cs
           Hello Time 2 sec 0 cs
```

```
Dynamic Path Cost is Disabled
```

Name	Role	State	Cost	Prio	Type
----	----	-----	----	----	-----
Gi0/1	Root	Forwarding	200000	128	SharedLan

## Multiple Instance:

```
Your Product# show spanning-tree active switch default
```

```
Switch default
```

```
Root Id     Priority 32768
           Address 00:51:02:03:04:05
           Cost      0
           Port      0 [0]
           This bridge is the root
           Max age 20 sec 0 cs, forward delay 15 sec 0 cs
           Hello Time 2 sec 0 cs
```

```
MST00
```

```
MST00 is executing the mstp compatible Multiple Spanning
Tree Protocol
```

```
Bridge Id   Priority 32768
           Address 00:51:02:03:04:05
           Max age 20 sec 0 cs, forward delay 15 sec 0 cs
           Hello Time 2 sec 0 cs
```

Name	Role	State	Cost	Prio	Type
----	----	-----	----	----	-----
Gi0/1	Designated	Forwarding	200000	128	SharedLan

---

## Related Command(s)

- **shutdown - physical/VLAN/port-channel/tunnel Interface -** Disables a physical interface / VLAN interface / port-channel interface / tunnel interface / OOB interface.
- **shutdown spanning-tree -** Shuts down spanning tree functionality in the switch.
- **spanning-tree -** Enables the spanning tree operation in the switch for the selected spanning tree Mode.

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- **spanning-tree Mode** - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.
- **spanning-tree compatibility** - Sets the STP compatibility version in the switch for all ports.
- **spanning-tree timers** - Sets the spanning tree timers such as hello time, that are used for controlling the transmission of BPDUs during the computation of loop free topology.
- **spanning-tree transmit hold-count** - Sets the transmit hold-count value for the switch.
- **clear spanning-tree counters** - Deletes all bridge and port level spanning tree statistics information.
- **spanning-tree pathcost dynamic** - Enables dynamic pathcost calculation feature in the switch.
- **spanning-tree priority** - Configures the priority value that is assigned to the switch.
- **spanning-tree - Properties of an interface** - Configures the port related spanning tree information for all kinds of STPs and creates port in STP when Automatic Port Create feature is disabled.
- **spanning-tree restricted-role** - Enables the restricted role feature for a port.
- **spanning-tree restricted-tcn** - Enables the topology change guard / restricted TCN feature on a port.
- **spanning-tree layer2-gateway-port** - Configures a port to operate as a L2GP.
- **spanning-tree bpdu-receive** - Configures the processing status of the BPDUs received in a port.
- **spanning-tree bpdu-transmit** - Configures the BPDU transmission status of a port.
- **spanning-tree loop-guard** - Enables the loop guard feature in a port.
- **spanning-tree - Pseudoroot configuration** - Configures the pseudoroot related information for a port set as L2GP.
- **spanning-tree mst- Properties of an interface for MSTP** - Configures the port related spanning tree information for a specified MSTI.
- **spanning-tree vlan** - Configures spanning tree related information on a per VLAN basis.

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- **spanning-tree vlan status** - Configures the status of PVRST on a port for the specified VLAN.
  - **spanning-tree vlan port-priority** - Configures the priority of a port for the specified VLAN.
  - **spanning-tree vlan cost** - Configures the cost of a port for the specified VLAN.
-

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## 16.1.26 show spanning-tree interface

<b>Command Objective</b>	<p>This command displays the port related spanning tree information for the specified interface.</p> <p>The information contains port ID, port role, port state, port cost, port priority and link type. The generic command cannot be executed without any option in the PVRST Mode.</p>
<b>Syntax</b>	<pre>show spanning-tree interface &lt;interface-type&gt; &lt;interface-id&gt; [{ cost   priority   portfast   rootcost   restricted-role   restricted-tcn   state   stats   detail }]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;interface-type&gt;</b> - Displays the port related spanning tree information for the specified type of interface. The interface can be:<ul style="list-style-type: none"><li>– qx-ethernet – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.</li><li>– gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.</li><li>– extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.</li><li>– port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.</li></ul></li><li>• <b>&lt;interface-id&gt;</b> - Displays the port related spanning tree information for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. For Example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided, for interface type port-channel. For Example: 1 represents port-channel ID.</li><li>• <b>cost</b> - Displays the cost of the port or instances assigned to that port. This option cannot be executed in the PVRST Mode.</li><li>• <b>priority</b> - Displays the priority of the port or instances assigned to that port. This option cannot be executed in the PVRST Mode.</li><li>• <b>portfast</b> - Displays the status of the portfast feature for the port or instances assigned to that port.</li><li>• <b>rootcost</b> - Displays the root cost of the port or instances assigned to that port. The root cost defines the pathcost to reach the root bridge. This option cannot be executed in the PVRST Mode.</li><li>• <b>restricted-role</b> - Displays the status of the restricted role feature for</li></ul>

---



the port. This option cannot be executed in the PVRST Mode.

- **restricted-tcn** - Displays the status of the restricted TCN feature for the port. This option cannot be executed in the PVRST Mode.
- **state** - Displays the state of the port. This option cannot be executed in the PVRST Mode.
- **stats** - Displays the port level spanning tree statistics information. This option cannot be executed in the PVRST Mode.
- **detail** - Displays detailed spanning tree related information for the port. The information contains current selected spanning Mode, bridge and root priority, bridge and root addresses, port path cost, port priority, port timers, bridge and port level spanning tree statistics information, link-type, and status of L2GP, loop guard, BPDU receive, BPDU transmit, restricted TCN, restricted role and portfast features. This option cannot be executed in the PVRST Mode.

**Mode** Privileged EXEC Mode



This command can be executed successfully, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.

## Example

### Single Instance

```
Your Product# show spanning-tree interface gigabitethernet 0/1
```

```
Instance Role State Cost Prio Type
----- ---
MST00 Root Forwarding 200000 128.1
SharedLan
```

```
Your Product# show spanning-tree interface gigabitethernet 0/1 cost
```

```
Port cost is 200000
```

```
Your Product# show spanning-tree interface gigabitethernet 0/1 priority
```

```
Port Priority is 128
```

```
Your Product# show spanning-tree interface gigabitethernet 0/1 portfast
```

```
PortFast is disabled
```

```
Your Product# show spanning-tree interface gigabitethernet 0/1 rootcost
```

```
Root Cost is 200000
```

```
Your Product# show spanning-tree interface gigabitethernet 0/1 state
```

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## Forwarding

```
Your Product# show spanning-tree interface gigabitethernet  
0/1 stats
```

```
Statistics for Port Gi0/1
```

```
Number of Transitions to forwarding State : 1  
Number of RSTP BPDU Count received       : 1692  
Number of Config BPDU Count received     : 9  
Number of TCN BPDU Count received        : 0  
Number of RSTP BPDU Count Transmitted    : 735  
Number of Config BPDU Count Transmitted  : 11  
Number of TCN BPDU Count Transmitted     : 0  
Number of Invalid BPDU Count Transmitted : 0  
Port Protocol Migration Count            : 1
```

```
Your Product# show spanning-tree interface gigabitethernet  
0/1 detail
```

```
Port 1 [Gi0/1] is Designated, Forwarding  
Port PathCost 200000, Port Priority 128, Port Identifier  
128.1  
Designated Root has priority 32768, address  
00:01:02:03:04:01  
Designated Bridge has priority 32768, address  
00:01:02:03:04:01  
Designated Port Id is 128.1, Designated PathCost 0  
No of Transitions to forwarding State :2  
PortFast is enabled  
Link Type is Shared  
BPDUs : sent 1780 , recieved 254  
Timers: Hello - 0, Forward Delay - 0, Topology Change - 0  
Restricted Role is disabled.  
Restricted TCN is disabled.  
bpdu-transmit enabled  
bpdu-receive enabled
```

```
Your Product# show spanning-tree interface fast 0/1  
restricted-role
```

```
Restricted Role is Disabled
```

```
Your Product# show spanning-tree interface fast 0/1  
restricted-tcn
```

```
Restricted TCN is Disabled
```

---

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## Multiple Instance:

```
Your Product# show spanning-tree interface gigabitethernet 0/1
```

```
Switch - default
```

Role	State	Cost	Prio	Type
----	-----	----	----	----
Root	Forwarding	200000	128	SharedLan

```
Your Product# show spanning-tree interface gigabitethernet 0/1 cost
```

```
Port cost is 200000
```

```
Switch - default
```

```
Your Product# show spanning-tree interface gigabitethernet 0/1 priority
```

```
Switch - default
```

```
Port Priority is 128
```

```
Your Product# show spanning-tree interface gigabitethernet 0/1 portfast Switch
```

```
- default PortFast
```

```
is disabled
```

```
Your Product# show spanning-tree interface gigabitethernet 0/1 rootcost
```

```
Switch - default
```

```
Root Cost is 200000
```

```
Your Product# show spanning-tree interface gigabitethernet 0/1 state
```

```
Switch - default
```

```
Forwarding
```

```
Your Product# show spanning-tree interface gigabitethernet 0/1 stats
```

```
Switch - default
```

```
Statistics for Port Gi0/1
```

```
Number of Transitions to forwarding State : 1
```

```
Number of RSTP BPDU Count received : 1692
```

```
Number of Config BPDU Count received : 9
```

```
Number of TCN BPDU Count received : 0
```

```
Number of RSTP BPDU Count Transmitted : 735
```

```
Number of Config BPDU Count Transmitted : 11
```

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---

```
Number of TCN BPDU Count Transmitted      : 0
Number of Invalid BPDU Count Transmitted  : 0
Port Protocol Migration Count              : 1

Your Product# show spanning-tree interface gigabitethernet
0/1 detail

Switch - default
Port 1 [Gi0/1] is Root          , Forwarding
Port PathCost 200000, Port Priority 128, Port Identifier
128.1

Designated Root has priority 8192, address
00:01:02:03:04:21

Designated Bridge has priority 8192, address
00:01:02:03:04:21

Designated Port Id is 128.1, Designated PathCost 0

No of Transitions to forwarding State :1
PortFast is disabled
Link Type is Shared
BPDUs : sent 735 , recieved 1729

Your Product# show spanning-tree interface fast 0/1
restricted-role

Switch - default
Restricted Role is Disabled

Your Product# show spanning-tree interface fast 0/1
restricted-tcn

Switch - default
Restricted TCN is Disabled
```


---

## Related Command(s)

- **shutdown spanning-tree** - Shuts down spanning tree functionality in the switch.
  - **spanning-tree** - Enables the spanning tree operation in the switch for the selected spanning tree Mode.
  - **spanning-tree Mode** - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.
  - **spanning-tree timers** - Sets the spanning tree timers such as hello time, that are used for controlling the transmission of BPDUs during the computation of loop free topology.
  - **clear spanning-tree counters** - Deletes all bridge and port level spanning tree statistics information.
-

- **spanning-tree priority** - Configures the priority value that is assigned to the switch.
  - **spanning-tree - Properties of an interface** - Configures the port related spanning tree information for all kinds of STPs and creates port in STP when Automatic Port Create feature is disabled.
  - **spanning-tree restricted-role** - Enables the restricted role feature for a port.
  - **spanning-tree restricted-tcn** - Enables the topology change guard / restricted TCN feature on a port.
  - **spanning-tree layer2-gateway-port** - Configures a port to operate as a L2GP.
  - **spanning-tree bpdu-receive** - Configures the processing status of the BPDUs received in a port.
  - **spanning-tree bpdu-transmit** - Configures the BPDU transmission status of a port.
  - **spanning-tree loop-guard** - Enables the loop guard feature in a port.
  - **spanning-tree - Pseudoroot configuration** - Configures the pseudoroot related information for a port set as L2GP.
  - **clear spanning-tree detected protocols** - Restarts the protocol migration process on all interfaces in the switch and forces renegotiation with the neighboring switches.
  - **spanning-tree mst- Properties of an interface for MSTP** - Configures the port related spanning tree information for a specified MSTI.
  - **spanning-tree mst hello-time** - Configures the hello time for an interface that is enabled.
  - **spanning-tree bpduguard** - Configures the status of BPDU guard feature in an interface.
-

## 16.1.27 show spanning-tree root

<b>Command Objective</b>	This command displays the spanning tree root information. The information contain root ID, root path cost, maximum age time, forward delay time and root port, for the RSTP. The information also contains the instance ID for MSTP.
<b>Syntax</b>	<code>show spanning-tree root [{ address   cost   forward-time   id   max-age   port   priority   detail }] [ switch &lt;context_name&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>address</code> - Displays the MAC address of the root bridge.</li><li>• <code>cost</code> - Displays the cost of the root bridge.</li><li>• <code>forward-time</code> - Displays the forward delay time of the root bridge.</li><li>• <code>id</code> - Displays the ID of the root bridge.</li><li>• <code>max-age</code> - Displays the maximum age time of the root bridge.</li><li>• <code>port</code> - Displays the ID of the root port.</li><li>• <code>priority</code> - Displays the priority of the root bridge.</li><li>• <code>detail</code> - Displays the root priority, root address, root cost, root port, forward delay time and maximum age time.</li><li>• <code>switch &lt;context_name&gt;</code> - Displays spanning tree root information, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
	<p>This command can be executed successfully, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.</p> <p>This configuration is not supported in PVRST Mode.</p>
<b>Example</b>	<p><b>Single Instance:</b></p> <pre>Your Product# show spanning-tree root Root ID                RootCost MaxAge FwdDly RootPort -----                -</pre>

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---

```
80:00:00:01:02:03:04:11 0 20 sec 0 cs 15 sec 0 cs 0
```

```
Your Product# show spanning-tree root address
```

```
Root Bridge Address is 00:01:02:03:04:11
```

```
Your Product# show spanning-tree root cost
```

```
Root Cost is 0
```

```
Your Product# show spanning-tree root forward-time
```

```
Forward delay is 15 sec 0 cs
```

```
Your Product# show spanning-tree root id
```

```
Root Bridge Id is 80:00:00:01:02:03:04:11
```

```
Your Product# show spanning-tree root max-age
```

```
Root MaxAge is 20 secs 0 cs
```

```
Your Product# show spanning-tree root port
```

```
Root Port is 0
```

```
Your Product# show spanning-tree root priority
```

```
Root Priority is 32768
```

```
Your Product# show spanning-tree root detail
```

```
We are the root of the Spanning Tree
```

```
Root Id      Priority    32768
```

```
Address     00:01:02:03:04:11
```

```
Cost        0
```

```
Port        0
```

```
Max Age 20 sec 0 cs, Forward Delay 15 sec 0 cs
```

## Multiple Instance:

```
Your Product# show spanning-tree root
```

```
Switch - default
```

```
Instance  Root ID          RootCost  MaxAge  FwdDly  RootPort
```

```
-----  -
```

```
MST00 80:00:00:01:02:03:04:01 0 20 sec 0 cs 15 sec 0 cs 0
```

```
Switch - cust1
```

```
Instance  Root ID          RootCost  MaxAge  FwdDly  RootPort
```

```
-----  -
```

```
MST00 00:00:00:01:02:03:04:04 200000 20 sec 0 cs 15 sec 0
```

```
cs      Gi0/2
```

---

## Related Command(s)

- `shutdown spanning-tree` - Shuts down spanning tree functionality in the switch.

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- **spanning-tree Mode** - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.
  - **spanning-tree timers** - Sets the spanning tree timers such as hello time, that are used for controlling the transmission of BPDUs during the computation of loop free topology.
  - **spanning-tree priority** - Configures the priority value that is assigned to the switch.
  - **spanning-tree - Properties of an interface** - Configures the port related spanning tree information for all kinds of STPs and creates port in STP when Automatic Port Create feature is disabled.
  - **spanning-tree mst hello-time** - Configures the hello time for an interface that is enabled.
-



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## 16.1.28 show spanning-tree bridge

<b>Command Objective</b>	This command displays the spanning tree bridge information. The information contain bridge ID, hello time, maximum age time, forward delay time and protocol enabled, for the RSTP. The information also contains the instance ID for MSTP.
<b>Syntax</b>	<pre>show spanning-tree bridge [{ address   forward-time   hello-time   id   max-age   protocol   priority   detail }] [ switch &lt;context_name&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>address</b> - Displays the MAC address of the bridge.</li><li>• <b>forward-time</b> - Displays the forward delay time of the bridge.</li><li>• <b>hello-time</b> - Displays the hello time of the bridge.</li><li>• <b>id</b> - Displays the ID of the bridge.</li><li>• <b>max-age</b> - Displays the maximum age time of the bridge.</li><li>• <b>protocol</b> - Displays the protocol currently enabled in the bridge.</li><li>• <b>priority</b> - Displays the priority of the bridge.</li><li>• <b>detail</b> - Displays the priority, address, maximum age time and forward delay time for the bridge.</li><li>• <b>switch</b> - Displays spanning tree bridge information, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
	<p>This command can be executed successfully, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.</p> <p>This configuration is not supported in PVRST Mode.</p>
<b>Example</b>	<p><b>Single Instance:</b></p> <pre>Your Product# show spanning-tree bridge address Bridge Address is 00:01:02:03:04:21</pre>

---

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---

```
Your Product# show spanning-tree bridge forward-time
```

```
Bridge Forward delay is 15 sec
```

```
Your Product# show spanning-tree bridge
```

```
Bridge ID          HelloTime MaxAge  FwdDly Protocol
-----
80:00:00:01:02:03:04:21  2 s 0 cs  20 s 0 cs 15 s 0 cs
rstp
```

```
Your Product# show spanning-tree bridge hello-time
```

```
Bridge Hello Time is 2 sec 0 cs
```

```
Your Product# show spanning-tree bridge id
```

```
Bridge ID is 80:00:00:01:02:03:04:21
```

```
Your Product# show spanning-tree bridge max-age
```

```
Bridge Max Age is 20 sec 0 cs
```

```
Your Product# show spanning-tree bridge protocol
```

```
Bridge Protocol Running is RSTP
```

```
Your Product# show spanning-tree bridge priority
```

```
Bridge Priority is 32768
```

```
Your Product# show spanning-tree bridge detail
```

```
Bridge Id      Priority 32768
                Address 00:05:02:03:04:01
                Max age is 20 sec 0 cs, forward delay is 15
sec 0 cs
```

## Multiple Instance:

```
Your Product# show spanning-tree bridge
```

```
Switch - default
```

```
MST Instance Bridge ID          MaxAge FwdDly Protocol
-----
```

```
MST00  0 :00:00:01:02:03:04:01 20 s 0 cs 15 s 0 cs mstp
```

```
Switch - cust1
```

```
MST Instance Bridge ID          MaxAge FwdDly Protocol
-----
```

```
MST00   0 :00:00:01:02:03:04:02 20 s 0 cs 15 s 0 cs mstp
```

```
Your Product# show spanning-tree bridge address
```

```
Switch - default
```

```
MST00    00:01:02:03:04:01
```

---

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---

---

Switch - cust1


MST00 00:01:02:03:04:0

---

## Related Command(s)

- **shutdown spanning-tree** - Shuts down spanning tree functionality in the switch.
  - **spanning-tree** - Enables the spanning tree operation in the switch for the selected spanning tree Mode.
  - **spanning-tree Mode** - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.
  - **spanning-tree timers** - Sets the spanning tree timers such as hello time, that are used for controlling the transmission of BPDUs during the computation of loop free topology.
  - **spanning-tree priority** - Configures the priority value that is assigned to the switch.
  - **spanning-tree mst hello-time** - Configures the hello time for an interface that is enabled.
-

## 16.1.29 show spanning-tree – layer 2 gateway port

<b>Command Objective</b>	This command displays spanning tree information for all L2GPs enabled in the switch. The information contains pseudoroot priority, pseudo root MAC address and state of the L2GP.
<b>Syntax</b>	<code>show spanning-tree [interface &lt;interface-type&gt; &lt;interface-id&gt;] layer2-gateway-port [switch &lt;context_name&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>&lt;interface-type&gt;</b> - Displays L2GP related spanning tree information for the specified type of interface. The interface can be: <ul style="list-style-type: none"> <li>– <b>qx-ethernet</b> – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>– <b>gigabitethernet</b> – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.</li> <li>– <b>extreme-ethernet</b> – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>– <b>port-channel</b> – Logical interface that represents an aggregator which contains several ports aggregated together.</li> </ul> </li> <li>• <b>&lt;interface-id&gt;</b> - Displays L2GP related spanning tree information for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. For Example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided, for interface type port-channel. For Example: 1 represents port-channel ID.</li> <li>• <b>switch &lt;context_name&gt;</b> - Displays L2GP related spanning tree information, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.</li> </ul>
<b>Mode</b>	Privileged EXEC Mode
	This command can be executed successfully, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.
<b>Example</b>	<pre>Your Product# show spanning-tree interface gigabitethernet 0/1 layer2-gateway-port switch default  Switch default Port Gi0/1</pre>

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PseudoRootId			
Instance	Priority	MacAddress	State
MST00	4096	00:00:11:22:33:44	Forwarding
MST01	8192	00:00:12:34:45:55	Forwarding
MST02	4096	00:00:12:34:45:5a	Forwarding

---

## Related Command(s)

- **shutdown - physical/VLAN/port-channel/tunnel Interface -** Disables a physical interface / VLAN interface / port-channel interface / tunnel interface / OOB interface.
  - **shutdown spanning-tree -** Shuts down spanning tree functionality in the switch.
  - **spanning-tree Mode -** Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.
  - **spanning-tree layer2-gateway-port -** Configures a port to operate as a L2GP.
  - **spanning-tree - Pseudoroot configuration -** Configures the pseudoroot related information for a port set as L2GP.
-

## 16.1.30 show customer spanning-tree

<b>Command Objective</b>	This command displays the detailed customer spanning tree information.
<b>Syntax</b>	<pre>show customer spanning-tree [cep interface &lt;interface-type&gt; &lt;interface-number&gt;] [{ detail [active]   active [detail] }]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>cep interface&lt;interface-type&gt; &lt;interface-number&gt;</b> - Displays the Customer Edge Port interface details. The details to be provided are: <ul style="list-style-type: none"> <li>– <b>&lt;interface-type&gt;</b> - Displays the customer spanning tree related information for the CEP type of interface. The interface can be: <ul style="list-style-type: none"> <li>▪ fastethernet – Officially referred to as 100BASE-T standard. This is a version of LAN standard architecture that supports data transfer upto 100 Megabits per second.</li> <li>▪ gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.</li> <li>▪ extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>▪ internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.</li> <li>▪ port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.</li> </ul> </li> <li>– <b>&lt;interface-number&gt;</b> - Displays the customer spanning tree related information for the CEP interface number. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than internal-lan and port-channel. For Example: 0/1 represents that the slot number is 0 and port number is 1. Only internal-lan and port-channel ID is provided, for interface types internal-lan and port-channel. For Example: 1 represents internal-lan and port-channel ID.</li> </ul> </li> <li>• <b>detail</b> - Displays in detail about the port and bridge. This includes designated Bridge details, designated port details, timer values, root bridge and so on.</li> <li>• <b>active</b> - Displays the Bridge and details of the active (active ports are those ports that are participating in the spanning-tree) ports</li> </ul>
<b>Mode</b>	Privileged EXEC Mode
	The port must be configured as CEP. This feature is not available on some SMIS switch models.
<b>Example</b>	<b>Single Instance:</b>

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```
Your Product# show customer spanning-tree cep interface
fast 0/1
```

```
Port [Gi0/1]
```

```
We are the root of the Spanning Tree
```

```
Root Id          Priority    65535
                Address    00:01:02:03:04:01
                Cost      0
                Root Ports
                Hello Time 2 Sec 0 cs, Max Age 20 Sec 0 cs,
                Forward Delay 15 Sec 0 cs
```

```
Customer Spanning Tree Enabled Protocol RSTP
```

```
Bridge Id       Priority 65535
                Address 00:01:02:03:04:01
                Hello Time 2 Sec 0 cs, Max Age 20 Sec 0 cs,
                Forward Delay 15 Sec 0 cs
```

Name	Role	State	Cost	Prio	Type
PEP-Service: 2	Designated	Forwarding	128	32	SharedLan
CEP-Gi0/1	Designated	Forwarding	200000	32	SharedLan

```
Your Product# show customer spanning-tree
```

```
Port [Gi0/1]
```

```
We are the root of the Spanning Tree
```

```
Root Id          Priority    65535
                Address    00:01:02:03:04:01
                Cost      0
                Root Ports
                Hello Time 2 Sec, Max Age 0 Sec, Forward
                Delay 0 Sec
```

```
Customer Spanning Tree Enabled Protocol RSTP
```

```
Bridge Id       Priority 65535
                Address 00:01:02:03:04:01
                Hello Time 2 Sec 0 cs, Max Age 20 Sec 0 cs,
                Forward Delay 15 Sec 0 cs
```

Name	Role	State	Cost	Prio	Type
PEP-Service: 2	Designated	Forwarding	128	32	SharedLan
CEP-Gi0/1	Designated	Forwarding	200000	32	SharedLan

---

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**Multiple Instance:**

Your Product# show customer spanning-tree

Switch default

Port [Gi0/1]

We are the root of the Spanning Tree

Root Id            Priority    65535  
                  Address    00:01:02:03:04:01  
                  Cost        0

Root Ports

Hello Time 2 Sec 0 cs, Max Age 20 Sec 0 cs,

Forward Delay 15 Sec 0 cs

Customer Spanning Tree Enabled Protocol RSTP

Bridge Id         Priority 65535  
                  Address 00:01:02:03:04:01  
                  Hello Time 2 Sec 0 cs, Max Age 20 Sec 0 cs,  
                  Forward Delay 15 Sec 0 cs

Name	Role	State	Cost	Prio	Type
PEP-Service: 2	Designated	Forwarding	128	32	SharedLan
CEP-Gi0/1	Designated	Forwarding	200000	32	SharedLan

Your Product# show customer spanning-tree cep interface fastethernet 0/1

Switch default

Port [Gi0/1]

We are the root of the Spanning Tree

Root Id            Priority    65535  
                  Address    00:01:02:03:04:01  
                  Cost        0

Root Ports

Hello Time 2 Sec 0 cs, Max Age 20 Sec 0 cs,

Forward Delay 15 Sec 0 cs

Customer Spanning Tree Enabled Protocol RSTP

Bridge Id         Priority 65535  
                  Address 00:01:02:03:04:01  
                  Hello Time 2 Sec 0 cs, Max Age 20 Sec 0 cs,

---



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```
Forward Delay 15 Sec 0 cs
Name          Role    State    Cost    Prio    Type
----          -
PEP-Service: 2 Designated Forwarding 128    32 SharedLan
CEP-Gi0/1     Designated Forwarding 200000 32 SharedLan
```

---


**Related Command(s)**

- **show customer spanning-tree** – Displays the detailed customer spanning information
-

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## 16.1.31 spanning-tree forwarddelay optimization alternate-role

<b>Command Objective</b>	<p>This command enables or disables the optimization for spanning-tree related protocol during transition from alternate to designated port role.</p> <p>When role translation takes place from alternate to designated, the value with which forward-delay timer started is controlled by executing this command.</p>
<b>Syntax</b>	<pre>spanning-tree forwarddelay optimization alternate-role {enabled   disabled}</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>enabled</b> - Enables optimization for spanning-tree related protocol in alternate port role transition.</li><li>• <b>disabled</b> - Disables the optimization for spanning-tree related protocol in alternate port role transition.</li></ul>
<b>Mode</b>	Global Configuration Mode
	This command executes only if the RSTP is enabled.
<b>Default</b>	enabled
<b>Example</b>	<pre>Your Product(config)# spanning-tree forwarddelay optimization alternate-role enabled</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>spanning-tree mode</b> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch. The current selected type of spanning tree is enabled and the existing spanning tree type is disabled in the switch.</li></ul>

## 16.2 MSTP

Arcent MSTP is a portable implementation of the IEEE 802.1s standard. It is used to configure spanning tree on per VLAN basis or multiple VLANs per spanning tree. It allows you to build several MST over VLAN trunks, and group or associate VLANs to spanning tree instances, so the topology of one instance is independent of the other instance. It provides multiple forwarding paths for data traffic and enables load balancing. It improves the overall network fault tolerance, as failure in one instance does not affect the other instances.

This section describes all the commands for MSTP Configurations.


The list of commands for the configuration of MSTP is as follows:

- [spanning-tree mst max-hops](#)
- [spanning-tree mst configuration](#)
- [spanning-tree mst max-instance](#)
- [spanning-tree mst root](#)
- [spanning-tree mst forward-time](#)
- [spanning-tree mst max-age](#)
- [name](#)
- [revision](#)
- [instance](#)
- [spanning-tree mst- Properties of an interface for MSTP](#)
- [spanning-tree mst hello-time](#)
- [show spanning-tree mst - CIST or specified mst Instance](#)
- [show spanning-tree mst configuration](#)
- [show spanning-tree mst - Port Specific Configuration](#)
- [spanning-tree flush-interval](#)
- [spanning-tree flush-indication-threshold](#)


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## 16.2.1 spanning-tree mst max-hops

<b>Command Objective</b>	<p>This command configures the maximum number of hops permitted in the MSTP. This value ranges between 6 and 40.</p> <p>The number of hops represents the maximum number of switches that a packet can cross before it is dropped. The switch uses this value to avoid infinite looping of the packets, if it is elected as the root switch in the topology.</p> <p>The root switch always transmits a BPDU with the maximum hop count value. The receiving switch decrements the value by one and propagates the BPDU with modified hop count value. The BPDU is discarded and the information held is aged out, when the count reaches 0.</p> <p>The no form of this command resets the maximum number of hops to its default value.</p>
<b>Syntax</b>	<pre>spanning-tree mst max-hops &lt;value(6-40)&gt;</pre> <pre>no spanning-tree mst max-hops</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	20
	This command can be executed successfully, only if the spanning tree functionality is started in the switch. The type of spanning tree Mode should be set as mst.
<b>Example</b>	<pre>Your Product(config)#spanning-tree mst max-hops 10</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>shutdown spanning-tree</b> - Shuts down spanning tree functionality in the switch.</li><li>• <b>spanning-tree Mode</b> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li><li>• <b>show spanning-tree mst - CIST or specified mst Instance --</b> Displays multiple spanning tree information for all MSTIs in the switch.</li><li>• <b>show spanning-tree mst - Port Specific Configuration -</b> Displays multiple spanning tree port specific information for the specified port.</li></ul>

## 16.2.2 spanning-tree mst configuration


<b>Command Objective</b>	This command enters into MSTP configuration Mode, where instance specific and MST region configuration can be done.
<b>Syntax</b>	<code>spanning-tree mst configuration</code>
<b>Mode</b>	Global Configuration Mode
	This command can be executed successfully, only if the spanning tree functionality is started and enabled in the switch. The type of spanning tree Mode should be set as mst.
<b>Example</b>	<code>Your Product(config)#spanning-tree mst configuration</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>shutdown spanning-tree</code> - Shuts down spanning tree functionality in the switch.</li><li>• <code>spanning-tree Mode</code> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li></ul>

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## 16.2.3 spanning-tree mst max-instance

<b>Command Objective</b>	<p>This command configures the maximum number of active MSTIs that can be created. This value ranges between 1 and 64.</p> <p>This configuration allows you to limit the number of spanning tree instances to be allowed in the switch. This does not count the special MSTID such as PTETID, used to identify the VIDs which are used by ESPs.</p> <p>The no form of this command resets maximum MSTP instance value to its default value.</p>
<b>Syntax</b>	<pre>spanning-tree mst max-instance &lt;short(1-64)&gt;</pre> <pre>no spanning-tree mst max-instance</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	64
	This command can be executed successfully, only if the spanning tree functionality is started and enabled in the switch. The type of spanning tree Mode should be set as mst.
<b>Example</b>	<pre>Your Product(config)# spanning-tree mst max-instance 40</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>shutdown spanning-tree</b> - Shuts down spanning tree functionality in the switch.</li><li>• <b>spanning-tree Mode</b> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li><li>• <b>instance</b> - Creates an MST instance and maps it to VLANs.</li></ul>

## 16.2.4 spanning-tree mst root

<b>Command Objective</b>	<p>This command enables BPDU (Bridge Protocol Data Unit) transmission and reception on the interface.</p> <p>This command is a standardized implementation of the existing command; <b>spanning-tree priority</b>. It operates similar to the existing command.</p> <p>The no form of the command disables BPDU transmission and reception on the interface.</p>
<b>Syntax</b>	<pre>spanning-tree mst {instance-id &lt;instance-id(1-64)&gt;} root {primary   secondary}  no spanning-tree mst {instance-id &lt;instance-id(1-64)&gt;} root</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>instance-id &lt;instance-id(1-64)&gt;</b> - Configures the ID of MSTP instance already created in the switch. This value ranges between 1 and 64. The special value 4094 can be used only in the switch that supports PBB-TE. This special value represents PTETID that identifies VID used by ESPs. This option is applicable, only if the spanning tree Mode is set as mst.</li><li>• <b>primary</b> - Sets high enough priority (low value) for the switch so that the switch can be made as the bridge root of the spanning-tree instance. The priority value is set as 24576.</li><li>• <b>secondary</b> - Sets the switch as a secondary root, if the primary root fails. The priority value is set as 28672.</li></ul>
<b>Mode</b>	Global Configuration Mode
	<p>This command executes only if</p> <ul style="list-style-type: none"><li>• instance is created</li><li>• spanning tree Mode is set as mst.</li></ul>
<b>Example</b>	<pre>Your Product(config)# spanning-tree mst instance-id 1 root secondary</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>shutdown spanning-tree</b> - Shuts down spanning tree functionality in the switch.</li><li>• <b>spanning-tree Mode</b> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li></ul>

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- **spanning-tree mst configuration** – Enters into MSTP configuration Mode, where instance specific and MST region configuration can be done.
  - **instance** - Creates an MST instance and maps it to VLANs.
  - **show spanning-tree detail** - Displays detailed spanning tree information
  - **show spanning-tree active** - Displays spanning tree information of active ports
-



## 16.2.5 spanning-tree mst forward-time

**Command Objective** This command configures the forward timer of the spanning tree and the no form of the command sets the forward timer to the default value. The forward timer controls the speed at which a port changes its spanning tree state from Blocking state to Forwarding state. The timer value ranges between 4 and 30 seconds.

 This command is currently not supported.



The values configured for the spanning tree forward timers should satisfy the following conditions:

$2 * (\text{forward-time} - 1) \geq \text{max-age}$ , and  $\text{max-age} \geq 2 * (\text{hello-time} + 1)$

This command is a standardized implementation of the existing command; **spanning-tree timers**. It operates similar to the existing command.

**Syntax** `spanning-tree mst forward-time <seconds(4-30)>`

`no spanning-tree mst forward-time`

**Mode** Global Configuration Mode

**Default**

- forward-time - 15 secs



- The STP forward timers can be configured in the switch, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.
- This spanning tree timer's configuration is not supported in PVRST Mode.

**Example** `Your Product(config)# spanning-tree mst forward-time 4`

**Related Command(s)**

- `shutdown spanning-tree` - Shuts down spanning tree functionality in the switch.
- `spanning-tree Mode` - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.
- `show spanning-tree - Summary, Blockedports, Pathcost, redundancy` - Displays spanning tree related information available in the switch for the current STP enabled in the switch.
- `show spanning-tree detail` - Displays detailed spanning tree related




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information of the switch and all ports enabled in the switch.

- **show spanning-tree active** - Displays spanning tree related information available in the switch for the current STP enabled in the switch.
  - **show spanning-tree interface detail** - Displays detailed spanning tree related information for the specified port.
  - **show spanning-tree root** - Displays the spanning tree root information.
  - **show spanning-tree bridge** - Displays the spanning tree bridge information.
  - **show spanning-tree mst - CIST or specified mst Instance** - Displays multiple spanning tree information for all MSTIs in the switch.
  - **show spanning-tree mst - Port Specific Configuration** - Displays multiple spanning tree port specific information for the specified port.
-

## 16.2.6 spanning-tree mst max-age

<b>Command Objective</b>	<p>This command configures the max-age timer of the spanning tree. The max-age timer denotes the time (in seconds) after which the spanning tree protocol information learnt from the network on any port will be discarded. The timer value ranges between 6 and 40 seconds.</p> <p>The no form of the command sets the max-age timer to the default value</p> <p> Max-age timer can be configured in centi seconds through SNMP</p>
	<p>The values configured for the spanning tree forward timers should satisfy the following conditions:</p> <p><math>2 * (\text{forward-time} - 1) \geq \text{max-age}</math>, and <math>\text{max-age} \geq 2 * (\text{hello-time} + 1)</math></p> <p>This command is a standardized implementation of the existing command; <b>spanning-tree timers</b>. It operates similar to the existing command.</p>
<b>Syntax</b>	<pre>spanning-tree mst max-age &lt;seconds(6-40)&gt;</pre> <pre>no spanning-tree mst max-age</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	<ul style="list-style-type: none"><li>max-age - 20 secs</li></ul>
	<ul style="list-style-type: none"><li>The STP forward timers can be configured in the switch, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.</li><li>This spanning tree timer's configuration is not supported in PVRST Mode.</li></ul>
<b>Example</b>	<pre>Your Product(config)# spanning-tree mst max-age 7</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><b>shutdown spanning-tree</b> - Shuts down spanning tree functionality in the switch.</li><li><b>spanning-tree Mode</b> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li><li><b>show spanning-tree - Summary, Blockedports, Pathcost, redundancy</b> - Displays spanning tree related information available in the switch for the current STP enabled in the switch.</li></ul>

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- **show spanning-tree detail** - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.
  - **show spanning-tree active** - Displays spanning tree related information available in the switch for the current STP enabled in the switch.
  - **show spanning-tree interface detail** - Displays detailed spanning tree related information for the specified port.
  - **show spanning-tree root** - Displays the spanning tree root information.
  - **show spanning-tree bridge** - Displays the spanning tree bridge information.
  - **show spanning-tree mst - CIST or specified mst Instance** - Displays multiple spanning tree information for all MSTIs in the switch.
  - **show spanning-tree mst - Port Specific Configuration** - Displays multiple spanning tree port specific information for the specified port.
-

## 16.2.7 name

<b>Command Objective</b>	<p>This command configures the name for the MST region.</p> <p>The name is unique and used to identify the specific MST region. Each MST region contains multiple spanning tree instances and runs special instance of spanning tree known as IST to disseminate STP topology information for other STP instances.</p> <p>The no form of this command resets the name to its default value.</p>
<b>Syntax</b>	<pre>name &lt;string(32)&gt;</pre> <pre>no name</pre>
<b>Mode</b>	MSTP Configuration Mode
<b>Default</b>	Same as that of the base MAC address of the switch.
<b>Example</b>	<pre>Your Product(config-mst)#name regionone</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show spanning-tree mst configuration</code> - Displays multiple spanning tree instance related information.</li></ul>

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## 16.2.8 revision

<b>Command Objective</b>	<p>This command configures the revision number for the MST region. This value ranges between 0 and 65535.</p> <p>The no form of this command resets the revision number to its default value.</p>
<b>Syntax</b>	<pre>revision &lt;value(0-65535)&gt;</pre> <pre>no revision</pre>
<b>Mode</b>	MSTP Configuration Mode
<b>Default</b>	0
<b>Example</b>	<pre>Your Product(config-mst)#revision 100</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show spanning-tree mst configuration</code> - Displays multiple spanning tree instance related information.</li></ul>

---

## 16.2.9 instance

<b>Command Objective</b>	<p>This command creates an MST instance and maps it to VLANs.</p> <p>The no form of this command deletes the instance / unmaps specific VLANs from the MST instance.</p>
<b>Syntax</b>	<pre>instance &lt;instance-id(1-64 4094)&gt; vlan &lt;vlan-range&gt;</pre> <pre>no instance &lt;instance-id (1-64)&gt; [vlan &lt;vlan-range&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;instance-id(1-64 4094)&gt;</b> - Configures the ID of MSTP instance to be created / deleted and mapped with / unmapped from VLAN. This value ranges between 1 to 64. The special value 4094 can be used in the switch that supports PBB-TE. Except vlan instance mapping, other commands for stp configurations will not be applicable in this Mode. This special value represents PTETID that identifies VID used by ESPs.</li><li>• <b>vlan &lt;vlan-range&gt;</b> - Configures a VLAN ID or list of VLAN IDs that should be mapped with / unmapped from the specified MST instance. This value is a string whose maximum size is 9. For Example, the value is provided as 4000-4010 to represent the list of VLANs IDs from 4000 to 4010.</li></ul>
<b>Mode</b>	MSTP configuration Mode
<b>Default</b>	Instance 0 is created and mapped with all VLANs (1-4094).
<b>Example</b>	<pre>Your Product(config-mst)#instance 2 vlan 2</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>spanning-tree priority</b> - Configures the priority value that is assigned to the switch.</li><li>• <b>spanning-tree - Pseudoroot configuration</b> - Configures the pseudoroot related information for a port set as L2GP.</li><li>• <b>spanning-tree mst max-instance</b> - Configures the maximum number of active MSTIs that can be created.</li><li>• <b>spanning-tree mst- Properties of an interface for MSTP</b> - Configures the port related spanning tree information for a specified MSTI.</li><li>• <b>show spanning-tree mst - CIST or specified mst Instance</b> - Displays multiple spanning tree information for all MSTIs in the switch.</li><li>• <b>show spanning-tree mst configuration</b> - Displays multiple spanning tree instance related information.</li></ul>


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- **show spanning-tree mst - Port Specific Configuration -**  
Displays multiple spanning tree port specific information for the specified port
-



## 16.2.10 spanning-tree mst- Properties of an interface for MSTP

<b>Command Objective</b>	<p>This command configures the port related spanning tree information for a specified MSTI in a port.</p> <p>The no form of this command resets the spanning tree information of a port to its default value.</p>
<b>Syntax</b>	<pre>spanning-tree mst &lt;instance-id(1-64)&gt; { cost &lt;value(1-200000000)&gt;   port-priority &lt;value(0-240)&gt;   disable }  no spanning-tree mst &lt;instance-id(1-64)&gt; { cost   port-priority   disable }</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;instance-id(1-64)&gt;</b> - Configures the ID of MSTP instance already created in the switch. This value ranges between 1 to 64.</li><li>• <b>cost&lt;value(1-200000000)&gt;</b> - Configures the port's path cost value that contributes to the path cost of paths containing this particular port. The paths' path cost is used during calculation of shortest path to reach the root. The path cost represents the distance between the root port and designated port. This value ranges between 1 and 200000000. The configured path cost is used, even if the dynamic pathcost calculation feature or LAGG speed feature is enabled.</li><li>• <b>port-priority&lt;value(0-240)&gt;</b> - Configures the priority value assigned to the port. This value is used during port role selection process. This value ranges between 0 and 240. This value should be set in steps of 16, that is, you can set the value as 0, 16, 32, 48, and so on. The MSTP puts the interface with lowest number in forwarding state and blocks all other interfaces, if all interfaces have the same priority value.</li><li>• <b>disable</b> - Disables the spanning tree operation on the port. The port does not take part in the execution of spanning tree operation for preventing undesirable loops in the network.</li></ul>
<b>Mode</b>	Interface Configuration Mode (Physical Interface Mode)
<b>Default</b>	<ul style="list-style-type: none"><li>• cost - 200000 for all physical ports; 199999 for port channels</li><li>• port-priority - 128</li><li>• disable - Spanning tree operation is enabled in the port.</li></ul>
	<p>This command can be executed successfully, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set as mst</p>

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## Example

```
Your Product(config-if)#spanning-tree mst 2 cost 4000
```

```
Your Product(config-if)#spanning-tree mst 1 port-priority 32
```

```
Your Product(config-if)#spanning-tree mst 2 disable
```



---

## Related Command(s)

- **shutdown spanning-tree** - Shuts down spanning tree functionality in the switch.
  - **spanning-tree Mode** - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.
  - **spanning-tree pathcost dynamic** - Enables dynamic pathcost calculation feature in the switch.
  - **instance** - Creates an MST instance and maps it to VLANs.
  - **show spanning-tree - Summary, Blockedports, Pathcost, redundancy** - Displays spanning tree related information available in the switch for the current STP enabled in the switch.
  - **show spanning-tree detail** - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.
  - **show spanning-tree active** - Displays spanning tree related information available in the switch for the current STP enabled in the switch.
  - **show spanning-tree interface** - Displays the port related spanning tree information for the specified interface.
  - **show spanning-tree mst - CIST or specified mst Instance** - Displays multiple spanning tree information for all MSTIs in the switch.
-

## 16.2.11 spanning-tree mst hello-time

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<b>Command Objective</b>	<p>This command configures the spanning tree hello time.</p> <p>The no form of this command resets the hello time to its default value.</p> <p>The hello time represents the time interval (in seconds) between two successive configuration BPDUs generated by the switch on the port. This value is either 1 or 2 seconds. This value is applied to all active MSTIs.</p> <p> Hello Time can be configured in centi seconds through SNMP</p>
<b>Syntax</b>	<pre>spanning-tree mst hello-time&lt;value(1-2)&gt;</pre> <pre>no spanning-tree mst hello-time</pre>
<b>Mode</b>	Global Configuration Mode, Interface Configuration Mode (Physical Interface Mode)
<b>Default</b>	2 seconds
	This command can be executed successfully, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set as mst.
<b>Example</b>	<pre>Your Product(config-if)#spanning-tree mst hello-time 1</pre> <pre>Your Product(config)#spanning-tree mst hello-time 1</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>shutdown spanning-tree</b> - Shuts down spanning tree functionality in the switch.</li><li>• <b>spanning-tree Mode</b> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li><li>• <b>show spanning-tree - Summary, Blockedports, Pathcost, redundancy</b> - Displays spanning tree related information available in the switch for the current STP enabled in the switch.</li><li>• <b>show spanning-tree detail</b> - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.</li><li>• <b>show spanning-tree interface</b> - Displays the port related spanning tree information for the specified interface.</li><li>• <b>show spanning-tree root</b> - Displays the spanning tree root information.</li></ul>

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- **show spanning-tree bridge** - Displays the spanning tree bridge information.
  - **show spanning-tree mst - Port Specific Configuration** - Displays multiple spanning tree port specific information for the specified port.
-

## 16.2.12 show spanning-tree mst - CIST or specified mst Instance

<b>Command Objective</b>	<p>This command displays multiple spanning tree information for all MSTIs in the switch.</p> <p>The information contain MSTI ID, VLAN IDs mapped to the instance, bridge address and priority, root address and priority, IST root address, priority and path cost, forward delay, maximum age, maximum hop count, and port details of interfaces enabled in the switch. The port details contain interface ID, port role, port state, port cost, port priority and port link type.</p>
<b>Syntax</b>	<pre>show spanning-tree mst [&lt;instance-id(1-64 4094)&gt;] [detail] [ switch &lt;context_name&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>&lt;instance-id(1-64 4094)&gt;</b> - Displays the multiple spanning tree information for the specified MSTI. This value ranges between 1 to 64. The special value 4094 can be used only in the switch that supports PBB-TE. This special value represents PTETID that identifies VID used by ESPs.</li> <li>• <b>detail</b> - Displays the detailed multiple spanning tree information for the MSTI. This information contain MSTI ID, VLAN IDs mapped to the instance, bridge address and priority, root address and priority, IST root address, priority and path cost, forward delay, maximum age, maximum hop count, and BPDUs sent and received in the port.</li> <li>• <b>switch&lt;context_name&gt;</b> - Displays multiple spanning tree bridge information, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.</li> </ul>
<b>Mode</b>	Privileged EXEC Mode
	<p>This command can be executed successfully, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set as mst.</p>
<b>Example</b>	<p><b>Single Instance:</b></p> <pre>Your Product# show spanning-tree mst 1 ## MST01 Vlans mapped:    2 Bridge    Address 00:01:02:03:04:11    Priority 32768 Root      Address 00:01:02:03:04:11    Priority 32768 Root      this switch for MST01 Interface Role      Sts      Cost      Prio.Nbr  Type -----</pre>

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```
Gi0/1 Master Forwarding 200000 128.1 SharedLan
```

```
Your Product# show spanning-tree mst 1 detail
```

```
## MST01
Vlans mapped: 2
Bridge Address 00:01:02:03:04:11 Priority 32768
Root Address 00:01:02:03:04:11 Priority 32768
Root this switch for MST01
Gi0/1 of MST01 is Master , Forwarding
Port info port id 128.1 priority 128 cost 200000
Designated root address 00:01:02:03:04:11 priority
32768 cost 0
Designated bridge address 00:01:02:03:04:11 priority
32768 port id 128.1
```

## Multiple Instance:

```
Your Product# show spanning-tree mst 1
```

```
Switch - default
## MST01
Vlans mapped: 2
Bridge Address 00:01:02:03:04:11 Priority 32768
Root Address 00:01:02:03:04:11 Priority 32768
Root this switch for MST01
Interface Role Sts Cost Prio.Nbr Type
-----
Gi0/1 Master Forwarding 200000 128.1 SharedLan
```

---


## Related Command(s)

- **shutdown spanning-tree** - Shuts down spanning tree functionality in the switch.
  - **spanning-tree** - Enables the spanning tree operation in the switch for the selected spanning tree Mode.
  - **spanning-tree Mode** - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.
  - **spanning-tree timers** - Sets the spanning tree timers such as hello time, that are used for controlling the transmission of BPDUs during the computation of loop free topology.
  - **clear spanning-tree counters** - Deletes all bridge and port level spanning tree statistics information.
-

- **spanning-tree priority** - Configures the priority value that is assigned to the switch.
  - **spanning-tree - Properties of an interface** - Configures the port related spanning tree information for all kinds of STPs and creates port in STP when Automatic Port Create feature is disabled.
  - **spanning-tree layer2-gateway-port** - Configures a port to operate as a L2GP.
  - **spanning-tree - Pseudoroot configuration** - Configures the pseudoroot related information for a port set as L2GP.
  - **spanning-tree mst max-hops** - Configures the maximum number of hops permitted in the MST.
  - **instance** - Creates an MST instance and maps it to VLANs.
  - **spanning-tree mst- Properties of an interface for MSTP** - Configures the port related spanning tree information for a specified MSTI.
  - **shutdown - physical/VLAN/port-channel/tunnel Interface** - Disables a physical interface / VLAN interface / port-channel interface / tunnel interface.
-

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## 16.2.13 show spanning-tree mst configuration

<b>Command Objective</b>	This command displays multiple spanning tree instance related information. This information contains the MST region name, MST region revision, and a list containing MSTI IDs and VLAN IDs mapped to the corresponding MSTI.
<b>Syntax</b>	<code>show spanning-tree mst configuration [ switch &lt;context_name&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li><code>switch &lt;context_name&gt;</code> - Displays multiple spanning tree instance related information, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
	This command can be executed successfully, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set as mst.
<b>Example</b>	<p><b>Single Instance:</b></p> <pre>Your Product# show spanning-tree mst configuration Name                [00:02:02:03:04:01] Revision            0 Instance            Vlans mapped -----  0                   1,3-1024,1025-2048,2049-3072,                     3073-4094  1                   2 -----</pre> <p><b>Multiple Instance:</b></p> <pre>Your Product# show spanning-tree mst configuration Switch - default Name                [00:01:02:03:04:01] Revision            0 Instance            Vlans mapped -----  0                   1-1024,1025-2048,2049-3072,3073-4094</pre>



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```
-----  
Switch - cust1  
Name           [00:01:02:03:04:02]  
Revision       0  
Instance       Vlans mapped  
-----  
0              1-1024,1025-2048,2049-3072,3073-4094  
-----
```

---

## Related Command(s)

- **shutdown spanning-tree** - Shuts down spanning tree functionality in the switch.
  - **spanning-tree Mode** - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.
  - **name** - Configures the name for the MST region.
  - **revision** - Configures the revision number for the MST region.
  - **instance** - Creates an MST instance and maps it to VLANs.
-

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## 16.2.14 show spanning-tree mst - Port Specific Configuration

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**Command Objective** This command displays multiple spanning tree port specific information for the specified port. This information contains interface ID, edge port status, port link type, port hello time, BPDUs sent and received on the port, and instance related details. The instance details contain MSTI ID, MSTI role, MSTI status, MSTI cost and MSTI priority.

---

**Syntax**

```
show spanning-tree mst [<instance-id(1-64|4094)>]
interface <interface-type> <interface-id> [{ stats |
hello-time | detail }]
```

---

**Parameter Description**

- **<instance-id(1-64|4094)>** - Displays the multiple spanning tree port specific information for the specified MSTI. This value ranges between 1 to 64. The special value 4094 can be used only in the switch that supports PBB-TE. This special value represents PTETID that identifies VID used by ESPs.
- **<interface-type>** - Displays the multiple spanning tree port specific information for the specified type of interface. The interface can be:
  - qx-ethernet – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.
  - gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
  - extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.
  - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
- **<interface-id>** - Displays the multiple spanning tree port specific information for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. For Example: 0/1 represents that the slotnumber is 0 and port number is 1. Only port-channel ID is provided, for interface type port-channel. For Example: 1 represents port-channel ID.
- **stats** - Displays the number of BPDUs sent and received for the MSTIs assigned to the specified interface.
- **hello-time** - Displays the hello time of the MSTIs assigned to the specified interface.
- **detail** - Displays detailed multiple spanning tree port specific information for the specified interface. The information contain port priority, port cost,

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root address, priority and cost, IST address, priority and cost, bridge address, priority and cost, forward delay, maximum age, maximum hop count, and BPDUs sent and received.

**Mode** Privileged EXEC Mode



This command can be executed successfully, only if the spanning tree functionality is not shutdown in the switch. The type of spanning tree Mode should be set as mst.

**Example**

```
Your Product# show spanning-tree mst 1 interface
gigabitethernet 0/1

Switch default
Gi0/1 of MST00 is Disabled , Discarding
Edge port: no
Link type: Shared
Port Hello Timer: 2 sec 0 cs
Bpdus sent 0 , Received 0
Instance Role           Sts           Cost           Prio.Nbr
-----
0           Disabled       Discarding     200000         128.1

Your Product# show spanning-tree mst 1 interface
gigabitethernet 0/1 stats

MST01      Bpdus sent 2, Received 0

Your Product# show spanning-tree mst 1 interface
gigabitethernet 0/1 hello-time

MST01      2 secs 0 cs

Your Product# show spanning-tree mst 1 interface
gigabitethernet 0/1 detail

Gi0/1 of MST01 is Master , Forwarding
Port info      port id 128.1      priority 128      cost
200000

Designated root address 00:01:02:03:04:11      priority
32768 cost 0

Designated bridge address 00:01:02:03:04:11      priority
32768 port id 128.1
```

**Related Command(s)**

- **shutdown spanning-tree** - Shuts down spanning tree functionality in the switch.
- **spanning-tree** - Enables the spanning tree operation in the switch for the selected spanning tree Mode.


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- **spanning-tree Mode** - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.
  - **spanning-tree timers** - Sets the spanning tree timers such as hello time, that are used for controlling the transmission of BPDUs during the computation of loop free topology.
  - **clear spanning-tree counters** - Deletes all bridge and port level spanning tree statistics information.
  - **spanning-tree priority** - Configures the priority value that is assigned to the switch.
  - **spanning-tree - Properties of an interface** - Configures the port related spanning tree information for all kinds of STPs and creates port in STP when Automatic Port Create feature is disabled.
  - **spanning-tree layer2-gateway-port** – Configures a port to operate as a L2GP.
  - **spanning-tree - Pseudoroot configuration** - Configures the pseudoroot related information for a port set as L2GP.
  - **spanning-tree mst max-hops** - Configures the maximum number of hops permitted in the MST.
  - **instance** - Creates an MST instance and maps it to VLANs.
  - **spanning-tree mst hello-time** - Configures the hello time for an interface that is enabled.
-

## 16.2.15 spanning-tree flush-interval

---


<b>Command Objective</b>	<p>This command configures the flush interval timer value (in centi-seconds), which controls the number of flush indications invoked from spanning-tree module per instance basis. This value ranges between 0 and 500 centi-seconds.</p> <p>If the flush interval timer is set to zero, port and instance based flushing occurs(default functionality). If it is set to non-zero, instance based flushing occurs (dependent on the flush-indication-threshold value).</p> <p>The no form of the command resets the flush-interval timer to the default value.</p>
<b>Syntax</b>	<pre>spanning-tree flush-interval &lt;centi-seconds (0-500)&gt;</pre> <pre>no spanning-tree flush-interval</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	flush-interval - 0 centi-secs
	This command executes only if the spanning tree Mode is set as mst.
<b>Example</b>	<pre>Your Product(config)# spanning-tree flush-interval 20</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>spanning-tree Mode</b> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li><li>• <b>spanning-tree flush-indication-threshold</b> – Sets the spanning tree flush indication threshold for a specific instance.</li><li>• <b>show spanning-tree detail</b> - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.</li></ul>

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## 16.2.16 spanning-tree flush-indication-threshold

<b>Command Objective</b>	<p>This command configures the flush indication threshold value for a specific instance. This indicates the number of flush indications to go before the flush-interval timer method triggers. This value ranges between 0 and 65535.</p> <p>. When flush indication threshold is default value and flush interval is non-default value, instance based flushing occurs during the first flush indication trigger. When the flush indication threshold value is non-default(x) and flush-interval value is non-default, port &amp; instance based flushing is triggered until the threshold(x) is reached. Once the threshold is reached, instance based flushing is triggered &amp; timer starts.</p> <p>The no form of the command sets the flush indication threshold of the specific instance to the default value.</p>
<b>Syntax</b>	<pre>spanning-tree [mst &lt;instance-id&gt;] flush-indication-threshold &lt;value (0-65535)&gt;</pre> <pre>no spanning-tree flush-indication-threshold</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	flush-indication-threshold - 0
	<p>This command executes only if</p> <ul style="list-style-type: none"><li>• the spanning tree Mode is set as mst.</li><li>• the instance is created</li></ul>
<b>Example</b>	<pre>Your Product(config)# spanning-tree flush-indication-threshold 2</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>shutdown spanning-tree</b> - Shuts down spanning tree functionality in the switch.</li><li>• <b>spanning-tree Mode</b> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li><li>• <b>spanning-tree flush-interval</b> - Sets the spanning-tree flush interval timer value.</li><li>• <b>instance</b> - Creates an MST instance and maps it to VLANs.</li><li>• <b>show spanning-tree detail</b> - Displays detailed spanning tree related information of the switch and all ports enabled in the switch.</li></ul>

## Chapter

# 17

## LA

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LA (Link Aggregation) is a method of combining physical network links into a single logical link for increased bandwidth. LA increases the capacity and availability of the communications channel between devices (both switches and end stations) using existing Fast Ethernet and Gigabit Ethernet technology. LA also provides load balancing where the processing and communication activity is distributed across several links in a trunk, so that no single link is overwhelmed. By taking multiple LAN connections and treating them as a unified, aggregated link, practical benefits in many applications can be achieved. LA provides the following important benefits:

- Higher link availability
- Increased link capacity

Improvements are obtained using existing hardware (no upgrading to higher-capacity link technology is necessary)

The list of CLI commands for the configuration of LA is as follows:

- [shutdown port-channel](#)
- [set port-channel](#)
- [channel-protocol](#)
- [lACP system-priority](#)
- [lACP system-identifier](#)
- [port-channel load-balance](#)
- [lACP port-priority](#)
- [lACP port-identifier](#)
- [channel-group](#)
- [lACP wait-time](#)

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- [lACP timeout](#)
- [lACP rate](#)
- [lACP admin-key](#)
- [default port](#)
- [port-channel max-ports](#)
- [debug lACP](#)
- [debug etherchannel](#)
- [show etherchannel](#)
- [show interfaces - etherchannel](#)
- [show lACP](#)



## 17.1 shutdown port-channel

<b>Command Objective</b>	<p>This command shuts down LA feature in the switch and releases all resources allocated to the LA feature.</p> <p>The no form of the command starts and enables LA feature in the switch, and allocates required memory to the LA module. The LA feature is made available in the switch only if the LA is enabled in the switch.</p> <p>LA feature allows aggregating individual point-to-point links into a port channel group, so that the capacity and availability of the communications channel between devices are increased using the existing interface technology.</p>
<b>Syntax</b>	<pre>shutdown port-channel</pre> <pre>no shutdown port-channel</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	LA is started in the switch, but not enabled. That is LA operational status is disabled.
	LA cannot be started in the switch, if the base bridge Mode is configured as transparent bridging.
<b>Example</b>	<pre>Your Product(config)# shutdown port-channel</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>base bridge-Mode</b> - Configures the base Mode (either 802.1d transparent bridge Mode or 802.1q vlan aware bridge Mode) in which the VLAN feature should operate on the switch.</li><li>• <b>set port-channel</b> - Configures the admin status of LA in the switch.</li><li>• <b>lacp system-priority</b> - Configures the LACP priority that is associated with actor's system ID.</li><li>• <b>lacp system-identifier</b> - Configures the global LACP system ID.</li><li>• <b>port-channel load-balance</b> - Configures the load balancing policy for all port channels created in the switch.</li><li>• <b>lacp port-priority</b> - Configures the LACP port priority.</li><li>• <b>lacp port-identifier</b> - Configures the LACP actor admin port ID to be filled in the LACP PDUs.</li></ul>

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- **channel-group** - Adds the port as a member of the specified port channel that is already created in the switch.
  - **lacp wait-time** - Configures the LACP wait-time for an interface.
  - **lacp timeout** - Configures the LACP timeout period within which LACPDUs should be received on a port to avoid timing out of the aggregated link.
  - **lacp admin-key** - Configures the LACP actor admin key and LACP Mode for a port.
  - **default port** - Configures the port that should be set as default port for a port channel.
  - **port-channel max-ports** - Configures the maximum number of ports that can be attached to a port channel.
  - **show etherchannel** - Displays Etherchannel information for all port-channel groups created in the switch.
  - **show interfaces - etherchannel** - Displays Etherchannel details for all aggregated ports and port channels.
  - **show lacp** - Displays LACP counter / neighbor information for all port-channels.
  - **interface-configuration and deletion** - Allows to configure interface such as out of band management, port channel, tunnel and so on.
-

## 17.2 set port-channel

<b>Command Objective</b>	<p>This command configures the admin status of LA in the switch. The LA feature is made available in the switch only if the LA is enabled in the switch.</p> <p>LA feature allows aggregating individual point-to-point links into a port channel group, so that the capacity and availability of the communications channel between devices are increased using the existing interface technology.</p>
<b>Syntax</b>	<code>set port-channel { enable   disable }</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li><code>enable</code> - Enables LA feature in the switch. Also starts the LA in the switch if the LA is shutdown.</li> <li><code>disable</code> - Disables LA feature in the switch.</li> </ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	disable
<b>Example</b>	<code>Your Product(config)# set port-channel enable</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><code>shutdown port-channel</code> - Shuts down LA in the switch and releases the allocated resources to the switch.</li> <li><code>lACP system-priority</code> - Configures the LACP priority that is associated with actor's system ID.</li> <li><code>lACP system-identifier</code> - Configures the global LACP system ID.</li> <li><code>port-channel load-balance</code> - Configures the load balancing policy for all port channels created in the switch.</li> <li><code>lACP port-priority</code> - Configures the LACP port priority.</li> <li><code>lACP port-identifier</code> - Configures the LACP actor admin port ID to be filled in the LACP PDUs.</li> <li><code>channel-group</code> - Adds the port as a member of the specified port channel that is already created in the switch.</li> <li><code>lACP wait-time</code> - Configures the LACP wait-time for an interface.</li> <li><code>lACP timeout</code> - Configures the LACP timeout period within which LACPDUs should be received on a port to avoid timing out of the aggregated link.</li> </ul>

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- **lACP admin-key** - Configures the LACP actor admin key and LACP Mode for a port.
  - **default port** - Configures the port that should be set as default port for a port channel.
  - **port-channel max-ports** - Configures the maximum number of ports that can be attached to a port channel.
  - **show etherchannel** - Displays Etherchannel information for all port-channel groups created in the switch.
  - **show interfaces - etherchannel** - Displays Etherchannel details for all aggregated ports and port channels.
  - **show lacp** - Displays LACP counter / neighbor information for all port-channels.
  - **interface-configuration and deletion** - Allows to configure interface such as out of band management, port channel, tunnel and so on
-

## 17.3 channel-protocol

<b>Command Objective</b>	<p>This command enables link aggregation in the switch.</p> <p>This command is a standardized implementation of the existing command; <code>set port-channel</code>. It operates similar to the existing command.</p> <p>The no form of the command disables link aggregation in the switch.</p>
<b>Syntax</b>	<pre>channel-protocol { lacp   pagp }  no channel-protocol</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>lacp</code> - Configures LACP (Link Aggregation Control Protocol) to manage channeling.</li><li>• <code>pagp</code> - Configures PAgP (Port aggregation protocol) to manage channeling. This feature has been included to adhere to the Industry Standard CLI syntax. This feature is currently not supported.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	Link aggregation is disabled
<b>Example</b>	<pre>Your Product(config)# channel-protocol lacp</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>shutdown port-channel</code> - Shuts down LA in the switch and releases the allocated resources to the switch.</li><li>• <code>set port-channel</code> - Configures the admin status of LA in the switch</li><li>• <code>lacp system-priority</code> - Configures the LACP priority that is associated with actor's system ID.</li><li>• <code>lacp system-identifier</code> - Configures the global LACP system ID.</li><li>• <code>port-channel load-balance</code> - Configures the load balancing policy for all port channels created in the switch.</li><li>• <code>lacp port-priority</code> - Configures the LACP port priority.</li><li>• <code>lacp port-identifier</code> - Configures the LACP actor admin port ID to be filled in the LACP PDUs.</li><li>• <code>channel-group</code> - Adds the port as a member of the specified port channel that is already created in the switch.</li></ul>

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- **lacp wait-time** - Configures the LACP wait-time for an interface.
  - **lacp timeout** - Configures the LACP timeout period within which LACPDUs should be received on a port to avoid timing out of the aggregated link.
  - **lacp admin-key** - Configures the LACP actor admin key and LACP Mode for a port.
  - **default port** - Configures the port that should be set as default port for a port channel.
  - **port-channel max-ports** - Configures the maximum number of ports that can be attached to a port channel.
  - **show etherchannel** - Displays Etherchannel information for all port-channel groups created in the switch.
  - **show interfaces - etherchannel** - Displays Etherchannel details for all aggregated ports and port channels.
  - **show lacp** - Displays LACP counter / neighbor information for all port-channels.
  - **interface-configuration and deletion** - Allows to configure interface such as out of band management, port channel, tunnel and so on
-

## 17.4 lacp system-priority

**Command Objective** This command configures the LACP priority associated with actor's system ID. This priority value ranges between 0 and 65535. The switch with the lowest LACP decides the standby and active links in the LA.

The no form of the command resets the LACP priority to its default value.

**Syntax**

```
lacp system-priority <0-65535>
```

```
no lacp system-priority
```

**Mode** Global Configuration Mode

**Default** 32768



This command executes successfully, only if

- the LA functionality is started and enabled in the switch.
- when D-LAG status is disabled

**Example** `Your Product(config)# lacp system-priority 5`

**Related Command(s)**

- `shutdown port-channel` - Shuts down LA in the switch and releases the allocated resources to the switch.
- `set port-channel` - Configures the admin status of LA in the switch.
- `show etherchannel` - Displays Etherchannel information for all port-channel groups created in the switch.

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## 17.5 lacp system-identifier

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**Command Objective** This command configures the global LACP system ID. The system ID denotes a 6-octet unicast MAC address value that is used as a unique identifier for the switch containing the aggregator.

The no form of the command resets the global LACP System ID to its default value.

---

**Syntax** `lacp system-identifier <aa:aa:aa:aa:aa:aa>`  
`no lacp system-identifier`

---

**Mode** Global Configuration Mode



This command executes successfully, only if the LA functionality is started and enabled in the switch.

---

**Example** `Your Product(config)#lacp system-identifier`  
`00:01:02:03:04:05`

---

**Related Command(s)**

- `shutdown port-channel` - Shuts down LA in the switch and releases the allocated resources to the switch.
- `set port-channel` - Configures the admin status of LA in the switch.

---



## 17.6 port-channel load-balance

**Command Objective** This command configures the load balancing policy for all port channels created in the switch.

The policy sets the rule for distributing the Ethernet traffic among the aggregated links to establish load balancing.

The no form of the command resets the load balancing policy to its default value.

### Syntax

```
port-channel load-balance ([src-mac][dest-mac][src-dest-  
mac][src-ip][dest-ip][src-dest-ip][vlan-id][service-  
instance][mac-src-vid][mac-dest-vid][mac-src-dest-  
vid][dest-ip6][src-ip6][l3-protocol][dest-l4-port][src-l4-  
port][mpls-vc-label][mpls-tunnel-label][mpls-vc-tunnel-  
label]) [<port-channel-index(1-65535)>]
```

```
no port-channel load-balance [ <port-channel-index(1-  
65535)> ]
```

### Parameter Description

- **src-mac** - Distributes the load based on the source MAC address. The bits of the source MAC address in the packet are used to select the port in which the traffic should flow. Packets from different hosts use different ports in the channel, but packets from the same host use the same port.
- **dest-mac** - Distributes the load based on the destination host MAC address. The bits of the destination MAC address in the packet are used to select the port in which the traffic should flow. Packets to the same destination are sent on the same port, but packets to different destinations are sent on different ports in the channel
- **src-dest-mac** - Distributes the load based on the source and destination MAC address. The bits of the source and destination MAC address in the packet are used to select the port in which the traffic should flow.
- **src-ip** - Distributes the load based on the source IP address. The bits of the source IP address in the packet are used to select the port in which the traffic should flow.
- **dest-ip** - Distributes the load based on the destination IP address. The bits of the destination IP address in the packet are used to select the port in which the traffic should flow.
- **src-dest-ip** - Distributes the load based on the source and destination IP address. The bits of the source and destination IP address in the packet are used to select the port in which the traffic should flow.
- **vlan-id** - Distributes the load distribution based on VLAN ID. The VLAN ID in the packet is used to select the port in which the traffic should flow.

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- **service-instance** - Distributes the load based on service-instance. The ISID in the packet is used to select the port in which the traffic should flow. Packets with the same service-instance use the same port. Packets with different service-instance use different ports such that the load is balanced among ports. The port can have packets with different service-instances also.
- **mac-src-vid** - Distributes the load based on source MAC address and VLAN ID. The VLAN ID and source MAC address in the packet are used to select the port in which the traffic should flow.
- **mac-dest-vid** - Distributes the load based on destination MAC address and VLAN ID. The VLAN ID and destination MAC address in the packet are used to select the port in which the traffic should flow.
- **mac-src-dest-vid** - Distributes the load based on VLAN ID, and destination and source MAC address. The VLAN ID, source MAC address and destination MAC address in the packet are used to select the port in which the traffic should flow.
- **dest-ip6** - Distributes the load based on the destination IP6 address. The bits of the destination IP6 address in the packet are used to select the port in which the traffic should flow.
- **src-ip6** - Distributes the load based on the source IP6 address. The bits of the source IP6 address in the packet are used to select the port in which the traffic should flow.
- **l3-protocol** - Distributes the load based on the Layer 3 protocol. The bits of the Layer 3 protocol in the packet are used to select the port in which the traffic should flow.
- **dest-l4-port** - Distributes the load based on the destination Layer 4 port. The bits of the destination Layer 4 port in the packet are used to select the port in which the traffic should flow.
- **src-l4-port** - Distributes the load based on the source Layer 4 port. The bits of the source Layer 4 port in the packet are used to select the port in which the traffic should flow.
- **mpls-vc-label** - Distributes the load based on MPLS VC label. The MPLS VC label in the packet is used to select the port in which the traffic should flow.
- **mpls-tunnel-label** - Distributes the load based on MPLS tunnel label. The MPLS tunnel label in the packet is used to select the port in which the traffic should flow.
- **mpls-vc-tunnel-label** - Distributes the load based on MPLS VC and tunnel labels. The MPLS VC and tunnel labels in the packet are used to select the port in which the traffic should flow.
- **<port-channel-index(1-65535)>** - Configures the load balancing policy for the specified port-channel. This is a unique value that represents

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the specific port-channel created. This value ranges between 1 and 65535.

---

**Mode** Global Configuration Mode

---

**Default** src-dest-mac

---



- This command executes successfully, only if the LA functionality is started and enabled in the switch.
  - The following parameters are not supported in BCM target.
    - vlan-id
    - service-instance
    - mac-src-vid
    - mac-dest-vid
    - mac-src-dest-vid
    - dest-ip6
    - src-ip6
    - l3-protocol
    - dest-l4-port
    - src-l4-port
    - mpls-vc-label
    - mpls-tunnel-label
    - mpls-vc-tunnel-label
- Some parameters are not support for certain SMIS switch models.

---

**Example** `Your Product(config)# port-channel load-balance dest-mac 1`

---


**Related Command(s)**

- `shutdown port-channel` - Shuts down LA in the switch and releases the allocated resources to the switch.
  - `set port-channel` - Configures the admin status of LA in the switch.
  - `show etherchannel` - Displays Etherchannel information for all port-channel groups created in the switch.
  - `interface-configuration and deletion` - Allows to configure interface such as out of band management, port channel, tunnel and so on
-

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## 17.7 lacp port-priority

<b>Command Objective</b>	<p>This command configures the LACP port priority. This value ranges between 0 and 65535</p> <p>This port priority is used in combination with LACP port identifier during the identification of best ports in a port channel. The priority determines if the link is an active link or a standby link, when the number of ports in the aggregation exceeds the maximum number supported by the hardware. The links with lower priority becomes active links.</p> <p>The no form of the command resets the LACP port priority to its default value.</p>
<b>Syntax</b>	<pre>lacp port-priority &lt;0-65535&gt;</pre> <pre>no lacp port-priority</pre>
<b>Mode</b>	Interface Configuration Mode (Physical Interface Mode)
<b>Default</b>	128
	<ul style="list-style-type: none"><li>• This command executes successfully, only if the LA functionality is started and enabled in the switch.</li><li>• This configuration takes effect only on the interface that is configured for LACP.</li></ul>
<b>Example</b>	<pre>Your Product(config-if)# lacp port-priority 1</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>shutdown port-channel</code> - Shuts down LA in the switch and releases the allocated resources to the switch.</li><li>• <code>set port-channel</code> - Configures the admin status of LA in the switch.</li><li>• <code>channel-group</code> - Adds the port as a member of the specified port channel that is already created in the switch.</li><li>• <code>default port</code> - Configures the default port for a port channel.</li><li>• <code>show etherchannel</code> - Displays Etherchannel information for all port-channel groups created in the switch.</li><li>• <code>show interfaces - etherchannel</code> - Displays Etherchannel details for all aggregated ports and port channels.</li><li>• <code>show lacp</code> - Displays LACP counter information for all port-channels.</li></ul>

## 17.8 lacp port-identifier

**Command Objective** This command configures the LACP actor admin port ID to be filled in the LACP PDUs. This value represents the concerned aggregation port. This value ranges from 1 to 65535.

The maximum limit depends on the board. For Example, if the board has only 24 ports, then the maximum value will be 24 only. That is the value ranges from 1 to 24.

**Syntax** `lacp port-identifier <1-65535>`

**Mode** Interface Configuration Mode (Physical Interface Mode)

**Default** The port ID is set as the LACP actor admin port ID.



- This command executes successfully, only if the LA functionality is started and enabled in the switch.
- This configuration takes effect only on the interface that is configured for LACP.

**Example** `Your Product(config-if)# lacp port-identifier 2`

- Related Command(s)**
- `shutdown port-channel` - Shuts down LA in the switch and releases the allocated resources to the switch.
  - `set port-channel` - Configures the admin status of LA in the switch.
  - `channel-group` - Adds the port as a member of the specified port channel that is already created in the switch.
  - `default port` - Configures the port that should be set as default port for a port channel.
  - `show etherchannel` - Displays Etherchannel information for all port-channel groups created in the switch.
  - `show interfaces - etherchannel` - Displays Etherchannel details for all aggregated ports and port channels.

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## 17.9 channel-group

**Command Objective** This command adds the port as a member of the specified port channel that is already created in the switch.

The no form of the command deletes the aggregation of the port from all port channels.

**Syntax** `channel-group <channel-group-number(1-65535)> Mode {auto [non-silent] | desirable [non-silent] | on | active | passive }`

`no channel-group`

**Parameter Description**

- **<channel-group-number(1-65535)>** - Adds the port as a member of the specified port channel. This is a unique value that represents the specific port-channel created. This value ranges from 1 to 65535.
- **Mode** - Configures the LACP activity for the port:
  - **auto** - Places a port into a passive negotiating state in which the port responds to received PAgP packets, but does not initiate PAgP packet negotiation. This feature has been included to adhere to the Industry Standard CLI syntax. This feature is currently not supported.
  - **desirable** - Places a port into an active negotiating state in which the port initiates negotiations with other ports by sending PAgP packets. This feature has been included to adhere to the Industry Standard CLI syntax. This feature is currently not supported.
  - **[non-silent]** - Used with the **auto** or **desirable** keyword when traffic is expected from the other device. This feature has been included to adhere to the Industry Standard CLI syntax. This feature is currently not supported.
  - **active** - Starts LACP negotiation un-conditionally.
  - **passive** - Starts LACP negotiation only when LACP packet is received from peer.
  - **on** - Forces the interface to channel without LACP. This is equivalent to manual aggregation.

**Mode** Interface Configuration Mode (Physical Interface Mode)



This command can be executed successfully, only if the LA functionality is started and enabled in the switch.

**Example** `Your Product(config-if)# channel-group 1 Mode active`

**Related Command(s)**

- **shutdown port-channel** - Shuts down LA in the switch and releases the allocated resources to the switch.
  - **set port-channel** - Configures the admin status of LA in the switch.
  - **lACP port-priority** - Configures the LACP port priority.
  - **lACP port-identifier** - Configures the LACP actor admin port ID to be filled in the LACP PDUs.
  - **lACP wait-time** - Configures the LACP wait-time for an interface.
  - **lACP timeout** - Configures the LACP timeout period within which LACPDUs should be received on a port to avoid timing out of the aggregated link.
  - **default port** - Configures the port that should be set as default port for a port channel.
  - **show etherchannel** - Displays Etherchannel information for all port-channel groups created in the switch.
  - **show interfaces - etherchannel** - Displays Etherchannel details for all aggregated ports and port channels.
  - **show lACP** - Displays LACP counter / neighbor information for all port-channels.
  - **interface-configuration and deletion** - Allows to configure interface such as out of band management, port channel, tunnel and so on.
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## 17.10 lacp wait-time

---

**Command Objective** This command configures the LACP wait-time for an interface. This value ranges from 0 to 10 seconds.

The wait time represent the time (in seconds) till which the port waits before entering into aggregation after receiving partner information (that is, this represents the time taken to attach to the port channel).

The no form of the command resets the LACP wait-time to its default value.

---

**Syntax** `lacp wait-time <0-10>`

`no lacp wait-time`

---

**Mode** Interface Configuration Mode (Physical Interface Mode)

---

**Default** 2



- This command can be executed successfully, only if the LA functionality is started and enabled in the switch.
- This configuration takes effect only on the interface that is configured for LACP.


---

**Example** `Your Product(config-if)# lacp wait-time 1`

- 
- Related Command(s)**
- `shutdown port-channel` - Shuts down LA in the switch and releases the allocated resources to the switch.
  - `set port-channel` - Configures the admin status of LA in the switch.
  - `channel-group` - Adds the port as a member of the specified port channel that is already created in the switch.
  - `default port` - Configures the port that should be set as default port for a port channel.
  - `show etherchannel` - Displays Etherchannel information for all port-channel groups created in the switch.
  - `show interfaces - etherchannel` - Displays Etherchannel details for all aggregated ports and port channels.
-



## 17.11 lacp timeout

<b>Command Objective</b>	<p>This command configures the LACP timeout period within which LACPDU's should be received on a port to avoid timing out of the aggregated link.</p> <p>The no form of the command sets the LACP timeout period to its default value.</p>
<b>Syntax</b>	<pre>lacp timeout {long   short }</pre> <pre>no lacp timeout</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li><b>long</b> - Configures the LACP timeout period as 90 seconds. The LACP PDU is sent every 30 seconds.</li> <li><b>short</b> - Configures the LACP timeout period as 3 seconds. The LACP PDU is sent every second.</li> </ul>
<b>Mode</b>	Interface Configuration Mode (Physical Interface Mode)
<b>Default</b>	long
	<ul style="list-style-type: none"> <li>This command can be executed successfully, only if the LA functionality is started and enabled in the switch.</li> <li>This configuration takes effect only on the interface that is configured for LACP.</li> </ul>
<b>Example</b>	<code>Your Product(config-if)# lacp timeout short</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><b>shutdown port-channel</b> - Shuts down LA in the switch and releases the allocated resources to the switch.</li> <li><b>set port-channel</b> - Configures the admin status of LA in the switch.</li> <li><b>channel-group</b> - Adds the port as a member of the specified port channel that is already created in the switch.</li> <li><b>default port</b> - Configures the port that should be set as default port for a port channel.</li> <li><b>show etherchannel</b> - Displays Etherchannel information for all port-channel groups created in the switch.</li> <li><b>show interfaces - etherchannel</b> - Displays Etherchannel details for all aggregated ports and port channels.</li> <li><b>show lacp</b> - Displays LACP counter / neighbor information for all port-channels.</li> </ul>

## 17.12 lacp rate

**Command Objective** This command configures the LACP rate.

This command is a standardized implementation of the existing command; `lacp timeout`. It operates similar to the existing command.

The no form of the command sets the LACP rate to its default value.

**Syntax**

```
lacp rate {normal | fast }  
  
no lacp rate
```

**Parameter Description**

- `normal` - Ingresses the LACP control packets at normal rate. That is, LACP PDU is sent every 30 seconds and the timeout value (no packet is received from peer) is set as 90 seconds.
- `fast` - Ingresses the LACP control packets at fast rate. That is, LACP PDU is sent every 1 second and the timeout value is set as 3 seconds.

**Mode** Interface Configuration Mode (Physical Interface Mode)

**Default** normal



- This command can be executed successfully, only if the LA functionality is started and enabled in the switch.
- This configuration takes effect only on the interface that is configured for LACP.

**Example** `Your Product(config-if)# lacp rate fast`

**Related Command(s)**


- `shutdown port-channel` - Shuts down LA in the switch and releases the allocated resources to the switch.
- `set port-channel` - Configures the admin status of LA in the switch.
- `channel-group` - Adds the port as a member of the specified port channel that is already created in the switch.
- `lacp timeout` - Configures the LACP timeout period.
- `default port` - Configures the port that should be set as default port for a port channel.
- `show etherchannel` - Displays Etherchannel information for all port-channel groups created in the switch.

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- **show interfaces - etherchannel** - Displays Etherchannel details for all aggregated ports and port channels.
  - **show lacp** - Displays LACP counter / neighbor information for all port-channels.
-

## 17.13 lacp admin-key

<b>Command Objective</b>	This command configures the LACP actor admin key and LACP Mode for a port.
<b>Syntax</b>	<code>lacp admin-key &lt;(Admin Key)1-65535&gt; [Mode {active   passive}]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li><b>admin-key</b> - Configures the LACP actor admin key that is used while port participates in dynamic aggregation selection. The port is made as part of best aggregation selected based on system ID and admin key. This value ranges between 1 and 65535.</li> <li><b>Mode</b> - Configures the LACP Mode for the port. The different options are: <ul style="list-style-type: none"> <li><b>active</b> - Starts LACP negotiation un-conditionally.</li> <li><b>passive</b> - Starts LACP negotiation only when LACP packet is received from peer.</li> </ul> </li> </ul>
<b>Mode</b>	Interface Configuration Mode (Physical Interface Mode)
<b>Default</b>	Mode - active
	<ul style="list-style-type: none"> <li>This command can be executed successfully, only if the LA functionality is started and enabled in the switch.</li> <li>The admin key can be configured only for ports that select aggregator dynamically (the port is configured as default interface for a port channel)</li> </ul>
<b>Example</b>	<code>Your Product(config-if)# lacp admin-key 1 Mode active</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><b>shutdown port-channel</b> - Shuts down LA in the switch and releases the allocated resources to the switch.</li> <li><b>set port-channel</b> - Configures the admin status of LA in the switch.</li> <li><b>default port</b> - Configures the default port for a port channel.</li> <li><b>show etherchannel</b> - Displays Etherchannel information for all port-channel groups created in the switch.</li> <li><b>show interfaces - etherchannel</b> - Displays Etherchannel details for all aggregated ports and port channels.</li> <li><b>show lacp</b> - Displays LACP counter / neighbor information for all port-channels.</li> </ul>

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## 17.14 default port

---

**Command Objective** This command configures the port that should be set as default port for a port channel.

The configured port attaches with the port channel and participates only in dynamic aggregation selection.

The no form of the command deletes the default port assigned for the port channel.

---

**Syntax** `default port <interface-type> <interface-id>`  
`no default port`

---

**Parameter Description**

- **<interface-type>** - Configures the type of interface to be set as default port for the port channel. The interface can be:
  - fastethernet – Officially referred to as 100BASE-T standard. This is a version of LAN standard architecture that supports data transfer upto 100 Megabits per second.
  - gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
  - extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.
  - i-lan – Internal LAN created on a bridge per IEEE 802.1ap.
- **<interface-id>** - Configures the ID of the interface to be set as default port. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than i-lan. For Example: 0/1 represents that the slot number is 0 and port number is 1. Only i-lan ID is provided, for interface type i-lan. For Example: 1 represents i-lan ID.

---

**Mode** Interface Configuration Mode (Port Channel Interface Mode)



- This command can be executed successfully, only if the LA functionality is started and enabled in the switch.
- Only one port can be set as a default port.
- The port that is to be set as default port should have not been added as a member port for any of the port channel.

---

**Example** `Your Product(config-if)# default port gigabitethernet 0/1`

---

---

## Related Command(s)

- **shutdown port-channel** - Shuts down LA in the switch and releases the allocated resources to the switch.
  - **set port-channel** - Configures the admin status of LA in the switch.
  - **lacp port-priority** - Configures the LACP port priority.
  - **lacp port-identifier** - Configures the LACP actor admin port ID to be filled in the LACP PDUs.
  - **no channel-group** - Deletes the aggregation of the port from all port channels.
  - **lacp wait-time** - Configures the LACP wait-time for an interface.
  - **lacp timeout** - Configures the LACP timeout period within which LACPDUs should be received on a port to avoid timing out of the aggregated link.
  - **lacp admin-key** - Configures the LACP actor admin key and LACP Mode for a port.
  - **show etherchannel** - Displays Etherchannel information for all port-channel groups created in the switch.
  - **show interfaces - etherchannel** - Displays Etherchannel details for all aggregated ports and port channels.
  - **show lacp** - Displays LACP counter / neighbor information for all port-channels.
-

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## 17.15 port-channel max-ports

---

**Command Objective** This command configures the maximum number of ports that can be attached to a port channel. This value ranges between 2 and 8.

The best ports are maintained in active state and other ports are maintained in standby state, if the total number of ports attached to the port-channel exceeds the configured value.

---

**Syntax** `port-channel max-ports <integer (2-8)>`

---

**Mode** Interface Configuration Mode (Port Channel Interface Mode)

---

**Default** 8



This command can be executed successfully, only if the LA functionality is started and enabled in the switch.

---

**Example** `Your Product(config-if)# port-channel max-ports 5`

---

**Related Command(s)**

- `shutdown port-channel` - Shuts down LA in the switch and releases the allocated resources to the switch.
  - `set port-channel` - Configures the admin status of LA in the switch.
-

## 17.16 debug lacp

---

<b>Command Objective</b>	<p>This command enables the tracing of the LACP as per the configured debug levels. The trace statements are generated for the configured trace levels.</p> <p>This command allows combination of debug levels to be configured (that is, more than one level of trace can be enabled or disabled). The debug levels are configured one after the other and not in single execution of the command.</p> <p>The no form of the command disables the tracing of the LACP as per the configured debug levels. The trace statements are not generated for the configured trace levels</p>
<b>Syntax</b>	<pre>debug lacp [ { init-shutdown   mgmt   data   events   packet   os   failall   buffer   all } ]  no debug lacp [ { init-shutdown   mgmt   data   events   packet   os   failall   buffer   all } ]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>init-shutdown</b> - Generates debug statements for init and shutdown traces. These traces are generated during module initialization and shutdown.</li><li>• <b>mgmt</b> - Generates debug statements for management traces. This trace is generated whenever you configure any of the LA features.</li><li>• <b>data</b> - Generates debug statements for data path traces. This trace is generated during failure in packet processing.</li><li>• <b>events</b> - Generates debug statements for event traces. This trace is generated when any of packets are sent successfully or when an ACK is received.</li><li>• <b>packet</b> - Generates debug statements for packet dump traces. This trace is generated for all events generated during processing of packets.</li><li>• <b>os</b> - Generates debug statements for OS resource related traces. This trace is generated during failure in message queues.</li><li>• <b>failall</b> - Generates debug statements for all kind of failure traces.</li><li>• <b>buffer</b> - Generates debug statements for buffer related traces.</li><li>• <b>all</b> - Generates debug statements for all kinds of traces.</li></ul>
<b>Mode</b>	Privileged EXEC Mode

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<b>Default</b>	<code>init-shutdown</code>
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---

<b>Example</b>	<code>Your Product# debug lacp data</code>
----------------	--

---

## 17.17 debug etherchannel

**Command Objective** This command enables the tracing of the link aggregation module as per the configured debug levels. The trace statements are generated for the configured trace levels.

This command is a standardized implementation of the existing command; `debug lacp`. It operates similar to the existing command.

The no form of the command disables the tracing of the link aggregation as per the configured debug levels. The trace statements are not generated for the configured trace levels

**Syntax**

```
debug etherchannel {[all] [detail] [error] [event] [idb]}  
  
no debug etherchannel {[all] [detail] [error] [event] [idb]}
```

**Parameter Description**

- `all` - Generates debug statements for all kinds of traces.
- `detail` - Generates detailed debug statements for traces.
- `error` - Generates debug statements for all failure traces.
- `event` - Generates debug statements for event traces. This trace is generated when any of packets are sent successfully or when an ACK is received. Event generates error messages for the following scenarios
  - Packet reception/transmission
  - Timer expiry
  - Port creation/deletion indication
  - Port status change indication
- `idb` - Generates debug statements for interface descriptor block traces. This feature has been included to adhere to the Industry Standard CLI syntax. This feature is currently not supported.

**Mode** Privileged EXEC Mode

**Example** Your Product# `debug etherchannel detail`

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## 17.18 show etherchannel

---

<b>Command Objective</b>	This command displays Etherchannel information for all port-channel groups created in the switch. This information contains admin and oper status of port-channel module, and status of protocol operate Mode for each group.
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---

<b>Syntax</b>	<code>show etherchannel [[channel-group-number] { detail   load-balance   port   port-channel   summary   protocol   redundancy}]</code>
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---

<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>channel-group-number</b> - Displays Etherchannel information for the specified port-channel group. This is a unique value that represents the specific port-channel created. This value ranges from 1 to 65535.</li><li>• <b>detail</b> - Displays detailed Etherchannel information. The information contain admin and oper status of port channel module, LACP system priority, status of protocol operate Mode for each group, port details for each group and port channel details. The port details contain port state, group to which the port belongs, port Mode, aggregation state, port-channel ID, pseudo port-channel ID, admin key, oper key, port number, port state, and LACP port-priority, wait-time, port identifier, activity and timeout. The port channel details contain port channel ID, number of member ports, ID of hot standby port, port state, status of protocol operate Mode, aggregator MAC and default port ID.</li><li>• <b>load-balance</b> - Displays the load balancing policy applied for each port-channel groups.</li><li>• <b>port</b> - Displays the status of protocol operate Mode and port details for each group. The port details contain port state, group to which the port belongs, port Mode, aggregation state, port-channel ID, pseudo port-channel ID, admin key, oper key, port number, port state, and LACP port-priority, wait-time, port identifier, activity and timeout.</li><li>• <b>port-channel</b> - Displays the admin and oper status of port channel module, and port channel details. The port channel details contain port channel ID, number of member ports, ID of hot standby port, port state, status of protocol operate Mode, aggregator MAC and default port ID.</li><li>• <b>summary</b> - Displays the admin and oper status of port channel module, number of channel groups used, number of aggregators, group IDs, and port channel ID, status of protocol operate Mode and member ports for each group.</li><li>• <b>protocol</b> - Displays the status of protocol operate Mode for each port-channel group.</li><li>• <b>redundancy</b> - Displays the actor information and synchronized partner information for the port, port state flags decode information, and aggregation state. The actor information contain channel group ID, pseudo port channel ID and currentwhile split interval timer count value. The</li></ul>
------------------------------	---

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# Supermicro Switch Configuration CLI Guide

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partner information contains partner system ID, flags, LACP partner port priority and LACP partner oper key. The decode information contain LACP activity and LACP timeout.

---

**Mode** Privileged EXEC Mode

---



This command executes successfully, only if the LA functionality is started and enabled in the switch.

---

**Example**

**Your Product# show etherchannel**

```
Port-channel Module Admin Status is enabled
Port-channel Module Oper Status is enabled
Port-channel System Identifier is 00:01:02:03:04:01
                        Channel Group Listing
                        -----
```

```
Group : 1
-----
```

```
Protocol : LACP
```

**Your Product# show etherchannel 1 detail**

```
Port-channel Module Admin Status is enabled
Port-channel Module Oper Status is enabled
Port-channel System Identifier is 00:01:02:03:04:01
LACP System Priority: 32768
```

```
                        Channel Group Listing
                        -----
```

```
Group: 1
-----
```

```
Protocol :LACP
```

```
                        Ports in the Group
                        -----
```

```
Port : Gi0/1
-----
```

```
Port State = Up in Bundle
```

```
Channel Group : 1
```

```
Mode : Active
```

```
Pseudo port-channel = Po1
```

```
LACP port-priority = 128
```

```
LACP Wait-time = 2 secs
```

```
LACP Activity : Active
```

```
LACP Timeout : Long
```

---

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---

```
Aggregation State : Aggregation, Sync, Collecting,
Distributing, Defaulted

                LACP Port  Admin Oper   Port  Port
Port      State  Priority  Key   Key Number  State
-----
Gi0/1    Bundle  128      1     1     0x1     0xbe
Port-channel : Po1
-----

Number of Ports = 1
HotStandBy port = null
Port state = Port-channel Ag-Inuse
Protocol = LACP
Aggregator-MAC 00:01:02:03:04:19
Default Port = None

Your Product# show etherchannel 1 port
                Channel Group Listing
                -----

Group: 1
-----

Protocol :LACP

                Ports in the Group
                -----

Port : Gi0/1
-----

Port State = Up in Bundle
Channel Group : 1
Mode : Active
port-channel = Po1
Pseudo port-channel = Po1
LACP port-priority = 128
LACP Wait-time = 2 secs
LACP Port Identifier = 2
LACP Activity : Active
LACP Timeout : Long
Aggregation State : Aggregation, Sync, Collecting,
Distributing,
Port : Gi0/2
```

---

# Supermicro Switch Configuration CLI Guide

```
-----
Port State = Up in Bundle
Channel Group : 1
Mode : Active
port-channel = Po1
Pseudo port-channel = Po1
LACP port-priority = 128
LACP Wait-time = 2 secs
LACP Activity : Active
LACP Timeout : Long
Aggregation State : Aggregation, Sync, Collecting,
Distributing,

                LACP Port  Admin Oper   Port  Port
Port      State  Priority Key   Key Number  State
-----
Gi0/1    Bundle  128      1     1     0x1     0xbc
Gi0/2    Bundle  128      1     1     0x2     0xbc

Your Product# show etherchannel 1 port-channel
Port-channel Module Admin Status is enabled
Port-channel Module Oper Status is enabled
Port-channel System Identifier is 00:01:02:03:04:01
                Channel Group Listing
                -----
Group : 1
-----

                Port-channels in the group:
                -----
Port-channel : Po1
-----
Number of Ports = 1
HotStandBy port = null
Port state = Port-channel Ag-Inuse
Protocol = LACP
Aggregator-MAC 00:01:02:03:04:19
Default Port = None

Your Product# show etherchannel 1 summary
```

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---

```
Flags:
D - down          P - in port-channel
I - stand-alone  S - suspended
H - Hot-standby (LACP only)
Port-channel is enabled
Port-channel System Identifier is 00:01:02:03:04:05
Number of channel-groups in use: 1
Number of aggregators: 1
Group  Port-channel  Protocol  Ports
-----
1      Pol(P)          LACP      Gi0/1(P),Gi0/2(P)
```

**Your Product# show etherchannel 1 protocol**

Channel Group Listing

-----  
Group : 1

-----  
Protocol : LACP

**Your Product# show etherchannel load-balance**

Channel Group Listing

-----  
Group : 1

-----  
Source & Destination MAC Address

**Your Product# show etherchannel redundancy**

Actor Information for Port : Gi0/1

-----  
Channel Group : 1

Pseudo port-channel = Pol

CurrentWhile Split Interval Tmr Count = 1

Synced Partner Information for Port : Gi0/1

-----  
Partner System ID : 00:11:22:33:44:55

Flags : A

LACP Partner Port Priority : 128

LACP Partner Oper Key : 1

Port State Flags Decode

-----

```
Activity : Active
LACP Timeout : Long
Aggregation State : Aggregation, Sync, Collecting,
Distributing,
Actor Information for Port : Gi0/2
-----
Channel Group : 1
Pseudo port-channel = Po1
CurrentWhile Split Interval Tmr Count = 1
Synced Partner Information for Port : Gi0/2
-----
Partner System ID           : 00:11:22:33:44:55
Flags                        : A
LACP Partner Port Priority   : 128
LACP Partner Oper Key       : 1
Port State Flags Decode
-----
Activity : Active
LACP Timeout : Long
Aggregation State : Aggregation, Sync, Collecting,
Distributing,
```

---

## Related Command(s)

- **shutdown port-channel** - Shuts down LA in the switch and releases the allocated resources to the switch.
  - **set port-channel** - Configures the admin status of LA in the switch.
  - **lacp system-priority** - Configures the LACP priority that is associated with actor's system ID.
  - **port-channel load-balance** - Configures the load balancing policy for all port channels created in the switch.
  - **lacp port-priority** - Configures the LACP port priority.
  - **lacp port-identifier** - Configures the LACP actor admin port ID to be filled in the LACP PDUs.
  - **channel-group** - Adds the port as a member of the specified port channel that is already created in the switch.
  - **lacp wait-time** - Configures the LACP wait-time for an interface.
  - **lacp timeout** - Configures the LACP timeout period within which
-



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---

LACPDUs should be received on a port to avoid timing out of the aggregated link.

- **lACP admin-key** - Configures the LACP actor admin key and LACP Mode for a port.
  - **default port** - Configures the port that should be set as default port for a port channel.
  - **interface-configuration and deletion** - Allows to configure interface such as out of band management, port channel, tunnel and so on.
-

## 17.19 show interfaces - etherchannel

<b>Command Objective</b>	<p>This command displays Etherchannel details for all aggregated ports and port channels.</p> <p>The port details contain port state, group to which the port belongs, port Mode, aggregation state, port-channel ID, pseudo port-channel ID, admin key, oper key, port number, port state, and LACP port-priority, wait-time, port identifier, activity and timeout.</p> <p>The port channel details contain port channel ID, number of member ports, ID of hot standby port, port state, status of protocol operate Mode, aggregator MAC and default port ID.</p>
<b>Syntax</b>	<pre>show interfaces [&lt;interface-type&gt; &lt;interface-id&gt; ] etherchannel</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;interface-type&gt;</b> - Displays the Etherchannel details for the specified type of interface. The interface can be:<ul style="list-style-type: none"><li>– qx-ethernet – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.</li><li>– gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.</li><li>– extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.</li></ul></li><li>• <b>&lt;interface-id&gt;</b> - Displays the Etherchannel details for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. For Example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided, for interface type port-channel. For Example: 1 represents port-channel ID.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
	This command executes successfully, only if the LA functionality is started and enabled in the switch.
<b>Example</b>	<pre>Your Product# show interfaces gigabitethernet 0/1 etherchannel  Port : Gi0/1 ----- Port State = Up in Bundle Channel Group : 2</pre>

# Supermicro Switch Configuration CLI Guide

---

## Mode : Active

Pseudo port-channel = Po2

LACP port-priority = 128

LACP Port Identifier = 2

LACP Wait-time = 2 secs

LACP Activity : Passive

LACP Timeout : Long

Aggregation State : Aggregation, Sync, Collecting,  
Distributing,

Port	State	LACP Port Priority	Admin Key	Oper Key	Port Number	Port State
------	-------	-----------------------	--------------	-------------	----------------	---------------

---

Gi0/1	Bundle	128	2	2	0x1	0x3c
-------	--------	-----	---	---	-----	------

## Your Product# show interfaces etherchannel

Port : Gi0/1

-----

Port State = Up in Bundle

Channel Group : 2

## Mode : Active

Pseudo port-channel = Po2

LACP port-priority = 128

LACP Wait-time = 2 secs

LACP Activity : Passive

LACP Timeout : Long

Aggregation State : Aggregation, Sync, Collecting,  
Distributing,

Port : Gi0/2

-----

Port State = Up in Bundle

Channel Group : 2

## Mode : Active

Pseudo port-channel = Po2

LACP port-priority = 128

LACP Wait-time = 2 secs

LACP Activity : Passive

LACP Timeout : Long

# Supermicro Switch Configuration CLI Guide

---

```
Aggregation State : Aggregation, Sync, Collecting,
Distributing,
```

Port	State	LACP Port Priority	Admin Key	Oper Key	Port Number	Port State
Gi0/1	Bundle	128	2	2	0x1	0x3c
Gi0/2	Bundle	128	2	2	0x2	0x3c

```
Port-channel : Po2
```

```
Number of Ports = 2
```

```
HotStandBy port = null
```

```
Port state = Port-channel Ag-Inuse
```

```
Protocol = LACP
```

```
Aggregator-MAC 00:01:02:03:04:23
```

```
Default Port = None
```

---

## Related Command(s)

- **shutdown port-channel** - Shuts down LA in the switch and releases the allocated resources to the switch.
  - **set port-channel** - Configures the admin status of LA in the switch.
  - **lacp port-priority** - Configures the LACP port priority.
  - **lacp port-identifier** - Configures the LACP actor admin port ID to be filled in the LACP PDUs.
  - **channel-group** - Adds the port as a member of the specified port channel that is already created in the switch.
  - **lacp wait-time** - Configures the LACP wait-time for an interface.
  - **lacp timeout** - Configures the LACP timeout period within which LACPDUs should be received on a port to avoid timing out of the aggregated link.
  - **lacp admin-key** - Configures the LACP actor admin key and LACP Mode for a port.
  - **default port** - Configures the port that should be set as default port for a port channel.
-

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## 17.20 show lacp

**Command Objective** This command displays LACP counter / neighbor information for all port-channels.

**Syntax** `show lacp [<port-channel(1-65535)>] { counters | neighbor [detail] }`

**Parameter Description**

- `<port-channel(1-65535)>` - Displays LACP counter / neighbor information for the specified port-channel. This is a unique value that represents the specific port-channel created. This value ranges from 1 to 65535.
- `counters` - Displays the LACP counter information. The information contains port ID, LACPDU sent and received, number of markers sent and received, number of marker response sent and received, number of LACPDU packets and number of LACPDU errors.
- `neighbor [detail]` - `neighbor` - Displays LACP neighbor information. This information contains partner system ID, flags details, LACP partner port priority, operational key, and port state. `detail` - Displays detailed LACP neighbor information. This information contains partner system ID, flags, aggregation state, and LACP partner port priority, partner oper key, partner port state, activity and timeout.

**Mode** Privileged EXEC Mode



This command can be executed successfully, only if the LA functionality is started and enabled in the switch.

**Example**

```
Your Product# show lacp 1 counters
```

LACPDU	LACPDU		Marker		Marker Response		Pkts
	Sent	Recv	Sent	Recv	Sent	Recv	
Port							
Err							

-----

```
Channel group: 1
```

	Sent	Recv	Sent	Recv	Sent	Recv	Pkts
Gi0/1	394	352	0	0	0	0	0
Gi0/2	318	297	0	0	0	0	0

```
Your Product# show lacp neighbor detail
```

Flags:

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```
A - Device is in Active Mode
P - Device is in Passive Mode
Channel group 1 neighbors
Port Gi0/1
-----
Partner System ID           : 00:01:02:03:04:21
Flags                       : P
LACP Partner Port Priority   : 128
LACP Partner Oper Key       : 2
LACP Partner Port State     : 0x3c
Port State Flags Decode
-----
Activity : Passive
LACP Timeout : Long
Aggregation State : Aggregation, Sync, Collecting,
Distributing
Port Gi0/2
-----
Partner System ID           : 00:01:02:03:04:21
Flags                       : P
LACP Partner Port Priority   : 128
LACP Partner Oper Key       : 2
LACP Partner Port State     : 0x3c
Port State Flags Decode
-----
Activity : Passive
LACP Timeout : Long
Aggregation State : Aggregation, Sync, Collecting,
Distributing
```

---

## Related Command(s)

- **shutdown port-channel** - Shuts down LA in the switch and releases the allocated resources to the switch.
  - **set port-channel** - Configures the admin status of LA in the switch.
  - **lacp port-priority** - Configures the LACP port priority.
  - **channel-group** - Adds the port as a member of the specified port channel that is already created in the switch.
  - **lacp timeout** - Configures the LACP timeout period within which LACPDUs should be received on a port to avoid timing out of the
-

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aggregated link.

- **lacp admin-key** - Configures the LACP actor admin key and LACP Mode for a port.
  - **default port** - Configures the port that should be set as default port for a port channel.
  - **interface-configuration and deletion** - Allows to configure interface such as out of band management, port channel, tunnel and so on.
-

## Chapter 18

### LLDP

---

**LLDP (Link Layer Discovery Protocol)** supports a set of attributes that it uses to discover the neighbor devices. These attributes contain type, length, and value descriptions and are referred to as TLVs. LLDP supported devices can use TLVs to receive and send information to their neighbors.

The switch supports these mandatory basic management TLVs.

- Port description TLV
- System name TLV
- System description
- System capabilities TLV
- Management address TLV
- Port VLAN ID TLV ((IEEE 802.1 organizationally specific TLVs)
- MAC/PHY configuration/status TLV(IEEE 802.3 organizationally specific TLVs)

**SMIS LLDP** is a software implementation of the Link Layer Discovery Protocol (LLDP). It provides complete management capabilities using SNMP and CLI.

**SMIS LLDP** conforms to IEEE 802.1AB-2005 standard. The LLDP allows systems on an Ethernet LAN to advertise their key capabilities and also to learn about the key capabilities of other systems on the same Ethernet LAN. This, in turn, promotes a unified network management view of the LAN topology and connectivity to aid network administration and trouble-shooting.

**SMIS LLDP** provides the following features:

- Provides full conformance to the 802.1AB specification.
- Supports all mandatory TLVs (Chassis ID, Port ID and Time To Live).



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- Supports optional TLVs - Port description, System name, System description, System capabilities and Management address.
- Supports organizationally specific optional TLVs - Port VLAN ID, Port and protocol VLAN ID, VLAN name, MAC or PHY configuration or status, Link Aggregation and Maximum frame size.
- Provides a generic set of APIs for easy integration into different platforms.
- Supports the basic MIB, as well as, the extension MIBs in Appendix F and Appendix G, defined in the 802.1AB specification and a proprietary MIB for management.
- Provides support for configuration and management by providing generic APIs usable from different management schemes like SNMP, CLI.
- Provides support for notifications through Traps.
- Conforms to Flexible Software Architecture for Portability (FSAP2), thus ensuring portable code, which uses flexible buffer and timer management libraries.

The list of CLI commands for the configuration of LLDP is as follows:

- [shutdown lldp](#)
- [set lldp](#)
- [lldp transmit-interval](#)
- [lldp holdtime-multiplier](#)
- [lldp reinitialization-delay](#)
- [lldp tx-delay](#)
- [lldp notification-interval](#)
- [lldp chassis-id-subtype](#)
- [clear lldp counters](#)
- [clear lldp table](#)
- [lldp transmit / receive](#)
- [lldp notification](#)
- [lldp tlv-select basic-tlv](#)
- [lldp port-id-subtype](#)
- [lldp tlv-select dot1tlv](#)
- [lldp tlv-select dot3tlv](#)
- [debug lldp](#)
- [show lldp](#)
- [show lldp interface](#)
- [show lldp neighbors](#)
- [show lldp traffic](#)
- [show lldp local](#)
- [show lldp errors](#)
- [show lldp statistics](#)


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- [lldp dest-mac](#)
- [set lldp version](#)
- [lldp txCreditMax](#)
- [lldp MessageFastTx](#)
- [lldp txFastInit](#)
- [show lldp peer](#)

# Supermicro Switch Configuration CLI Guide

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## 18.1 shutdown lldp

<b>Command Objective</b>	<p>This command shuts down all the ports in the LLDP and releases all the allocated memory.</p> <p>The no form of the command enables all the ports by allocating the required resources in the LLDP</p>
<b>Syntax</b>	<pre>shutdown lldp</pre> <pre>no shutdown lldp</pre>
<b>Mode</b>	Global Configuration Mode
<b>Package</b>	Workgroup, Enterprise, Metro and Metro_E
	LLDP cannot be started in the switch, if the base bridge Mode is configured as transparent bridging.
<b>Example</b>	<pre>Your Product(config)# shutdown lldp</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>base bridge-mode</b> - Configures the base Mode (either 802.1d transparent bridge Mode or 802.1q vlan aware bridge Mode) in which the VLAN feature should operate on the switch.</li><li>• <b>set lldp</b> - Transmits or receives LLDP frames from the server to the LLDP module</li><li>• <b>lldp transmit / receive</b> - Transmits or receives LLDP frames from the one of the ports of the server to the LLDP module.</li><li>• <b>lldp tlv-select basic-tlv</b> - Enables the basic settings while transmitting the LLDP frames on a given port.</li><li>• <b>lldp tlv-select dot1tlv</b> - Configures dot1 TLV while transmitting the LLDP frames to the particular port</li><li>• <b>lldp tlv-select dot3tlv</b> - Configures dot3 TLV while transmitting the LLDP frames to the particular port</li><li>• <b>lldp transmit-interval</b> - Sets the transmission time interval in which the server sends the LLDP frames to the LLDP module.</li><li>• <b>lldp holdtime-multiplier</b> - Sets the holdtime-multiplier value, which is the amount of time, the server should hold the LLDP</li></ul>

---


- **lldp reinitialization-delay** - Sets the reinitialization delay time which is the minimum time an LLDP port will wait before reinitializing LLDP transmission.
  - **lldp tx-delay** - Sets the transmit delay which is the minimum amount of delay between successive.LLDP PDUs.
  - **lldp notification** - Controls the transmission of LLDP notifications.
  - **lldp notification-interval** - Sets the notification interval which is the minimum interval to generate a notification-event about a change in local system.
  - **lldp chassis-id-subtype** - Configures an ID for LLDP chassis subtype which is a unique address of any module.
  - **lldp port-id-subtype** - Configures an ID for LLDP port subtype
  - **clear lldp counters** - Clears the inbuilt counter which has the total count of LLDP frames transmitted/received..
  - **clear lldp table** - Clears all the LLDP information about the neighbors.
  - **debug lldp** - Specifies debug level for LLDP module.
  - **show lldp** - Displays the LLDP global configuration details to initialize on an interface.
  - **show lldp interface** - Displays the information about interfaces where LLDP is enabled .
  - **show lldp neighbors** - Displays information about neighbors on an interface or all interfaces.
  - **show lldp traffic** - Displays LLDP counters on all interfaces or on a specific interface
  - **show lldp local** - Displays the current switch information that will be used to populate outbound LLDP advertisements for a specific interface or all interfaces.
  - **show lldp errors** - Displays the information about the errors such as memory allocation failures, queue overflows and table overflow
  - **show lldp statistics** - Displays the LLDP remote table statistics information.
  - **lldp dest-mac** - Configures destination mac-address to be used by the LLDP agent for transmission on this port.
  - **set lldp version** - Enables the lldp version to be used on the ports.
-

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- **lldp txCreditMax** - Configures the maximum number of consecutive LLDPDUs that can be transmitted any time
  - **lldp MessageFastTx** - Configures the interval at which LLDP frames are transmitted on behalf of this LLDP agent during fast transmission period.
  - **lldp txFastInit** - Configures the initial value used to initialize the txFast variable which determines the number of transmissions that are made in fast transmission mode
-


## 18.2 set lldp

<b>Command Objective</b>	This command transmits or receives LLDP frames from the server to the LLDP module.
<b>Syntax</b>	<code>set lldp {enable   disable}</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li><b>enable</b> - Transmits/receives the LLDP packets between LLDP module and the server.</li> <li><b>disable</b> - Does not transmit/receive the LLDP packets between LLDP module and the server.</li> </ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	Disable
 <b>Example</b>	This command executes only if lldp is started  <code>Your Product(config)# set lldp enable</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><code>no shutdown lldp</code> – Starts all the ports in the LLDP and releases all the allocated memory.</li> <li><code>show lldp</code> - Displays LLDP global configuration details</li> <li><code>show lldp interface</code> - Displays the information about interfaces where LLDP is enabled .</li> <li><code>show lldp neighbors</code> - Displays information about the neighbors on an interface or all interfaces.</li> <li><code>show lldp traffic</code> - Displays LLDP counters on all interfaces or on a specific interface</li> <li><code>show lldp errors</code> - Displays the information about the errors such as memory allocation failures, queue overflows and table overflow.</li> <li><code>show lldp statistics</code> - Displays the LLDP remote table statistics information.</li> </ul>



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## 18.3 lldp transmit-interval

<b>Command Objective</b>	<p>This command sets the transmission interval in which the server sends the LLDP frames to the LLDP module. The value ranges between 5 and 32768 seconds.</p> <p>The no form of the command sets the transmission interval to the default value</p>
<b>Syntax</b>	<pre>lldp transmit-interval &lt;seconds(5-32768)&gt;</pre> <pre>no lldp transmit-interval</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	30 seconds
	This command executes only if lldp is started
<b>Example</b>	<pre>Your Product(config)# lldp transmit-interval 50</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>no shutdown lldp</code> – Starts all the ports in the LLDP and releases all the allocated memory.</li><li>• <code>show lldp</code> - Displays LLDP global configuration details</li></ul>

## 18.4 lldp holdtime-multiplier

<b>Command Objective</b>	<p>This command sets the holdtime-multiplier value, which is the amount of time, the server should hold the LLDP. The value ranges between 2 and 10 seconds.</p> <p>The no form of the command sets the multiplier to the default value</p>
	<p>TLV (Time to Live) A value that tells the receiving agent, how long the information contained in the TLV Value field is valid.</p> <p style="text-align: center;">TTL = message transmission interval * hold time multiplier.</p> <p>For Example, if the value of LLDP transmission interval is 30, and the value of the LLDP hold multiplier is 4, then the value 120 is encoded in the TTL field in the LLDP header.</p>
<b>Syntax</b>	<pre>lldp holdtime-multiplier &lt;value(2-10)&gt;</pre> <pre>no lldp holdtime-multiplier</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	4
	This command executes only if lldp is started
<b>Example</b>	<pre>Your Product(config)# lldp holdtime-multiplier 5</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>no shutdown lldp</code> – Starts all the ports in the LLDP and releases all the allocated memory.</li><li>• <code>show lldp</code> - Displays LLDP global configuration details.</li><li>• <code>lldp tx-delay</code> - Sets transmit delay which is the minimum amount of delay between successive LLDP frame transmissions.</li></ul>



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## 18.5 lldp reinitialization-delay

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**Command Objective** This command sets the reinitialization delay time which is the minimum time an LLDP port will wait before reinitializing LLDP transmission. The value ranges between 1 and 10 seconds.

The no form of the command sets the reinitialization delay time to the default value.

---

**Syntax** `lldp reinitialization-delay <seconds(1-10)>`  
`no lldp reinitialization-delay`

---

**Mode** Global Configuration Mode

---

**Default** 2 seconds



This command executes only if lldp is started

---

**Example** `Your Product(config)# lldp reinitialization-delay 4`

---

**Related Command(s)**

- `no shutdown lldp` – Starts all the ports in the LLDP and releases all the allocated memory.
- `show lldp` - Displays LLDP global configuration details

---

## 18.6 lldp tx-delay

**Command Objective** This command sets the transmit delay which is the minimum amount of delay between successive LLDP frame transmissions. The value ranges between 1 and 8192 seconds.

The no form of the command sets the transmit delay to the default value.



TxDelay should be less than or equal to  $(0.25 * \text{Message Tx Interval})$

**Syntax** `lldp tx-delay <seconds(1-8192)>`

`no lldp tx-delay`

**Mode** Global Configuration Mode

**Default** 2 seconds



This command executes only if lldp is started

**Example** `Your Product(config)# lldp tx-delay 120`


**Related Command(s)**

- `no shutdown lldp` – Starts all the ports in the LLDP and releases all the allocated memory.
- `show lldp` - Displays LLDP global configuration details
- `lldp holdtime-multiplier` - Sets the holdtime-multiplier value, which is the amount of time, the server should hold the LLDP.

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## 18.7 lldp notification-interval

<b>Command Objective</b>	<p>This command sets the time interval in which the local system generates a notification-event. In the specific interval, generating more than one notification-event is not possible. The value ranges between 5 and 3600 seconds.</p> <p>The no form of the command sets the notification interval to the default value.</p>
<b>Syntax</b>	<pre>lldp notification-interval &lt;seconds(5-3600)&gt;</pre> <pre>no lldp notification-interval</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	5 seconds
	This command executes only if lldp is started
<b>Example</b>	<pre>Your Product(config)# lldp notification-interval 150</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show lldp</code> - Displays LLDP global configuration details</li><li>• <code>no shutdown lldp</code> - Starts all the ports in the LLDP and releases all the allocated memory.</li></ul>

---

## 18.8 lldp chassis-id-subtype

<b>Command Objective</b>	This command configures an ID for LLDP chassis subtype which is a unique address of any module.
	 Chassis id value can be set only for the chassis-component and local system subtypes. For all other subtypes, it takes the value from the system automatically.
<b>Syntax</b>	<pre>lldp chassis-id-subtype { chassis-comp &lt;string(255)&gt;   if-alias   port-comp &lt;string(255)&gt;   mac-addr   nw-addr   if-name   local &lt;string(255)&gt; }</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>chassis-comp &lt;string(255)&gt;</b> - Represents a chassis identifier based on the value of entPhysicalAlias object for a chassis component</li> <li>• <b>if-alias</b> - Represents a chassis identifier based on the value of ifAlias for an interface on the containing chassis.</li> <li>• <b>port-comp &lt;string(255)&gt;</b> - Represents a chassis identifier based on the value of entPhysicalAlias object for a port or backplane within the chassis.</li> <li>• <b>mac-addr</b> - Represents a chassis identifier based on the value of a unicast source address, of a port on the chassis.</li> <li>• <b>nw-addr</b> - Represents a chassis identifier based on a network address, associated with a particular chassis. The encoded address is actually composed of two fields. The first field is a single octet, representing the IANA AddressFamilyNumbers value for the specific address type, and the second field is the network address value.</li> <li>• <b>if-name</b> - Represents a chassis identifier based on the value of ifName object for an interface on the containing chassis.</li> <li>• <b>local &lt;string(255)&gt;</b> - Represents a chassis identifier based on a locally defined value."</li> </ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	mac-addr
	This command executes only if lldp is started
<b>Example</b>	<pre>Your Product(config)# lldp chassis-id-subtype chassis-comp Aricentswitch  Your Product(config)# lldp chassis-id-subtype if-alias</pre>

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## Related Command(s)

- `show lldp` - Displays LLDP global configuration details
  - `show lldp local` - Displays the current switch information that will be used to populate outbound LLDP advertisements for a specific interface or all interfaces.
  - `no shutdown lldp` - Starts all the ports in the LLDP and releases all the allocated memory.
-

## 18.9 clear lldp counters

---

**Command Objective** This command clears the inbuilt counter which has the total count of LLDP frames that are transmitted/ received.

 This command does not clear the global statistics.

---

**Syntax** `clear lldp counters`

---

**Mode** Global Configuration Mode



This command executes only if lldp is started

---

**Example** `Your Product(config)# clear lldp counters`

---

**Related Command(s)**


- `show lldp traffic` - Displays the LLDP counters on all interfaces or on a specific interface
- `no shutdown lldp` - Starts all the ports in the LLDP and releases all the allocated memory.

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## 18.10 clear lldp table

<b>Command Objective</b>	This command clears all the LLDP information about the neighbors.
<b>Syntax</b>	<code>clear lldp table</code>
<b>Mode</b>	Global Configuration Mode
 <b>Tip</b>	This command executes only if lldp is started
<b>Example</b>	<code>Your Product(config)# clear lldp table</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show lldp neighbors</code> - Displays information about the neighbors on an interface or all interfaces.</li><li>• <code>no shutdown lldp</code> - Starts all the ports in the LLDP and releases all the allocated memory.</li></ul>

## 18.11 lldp transmit / receive


<b>Command Objective</b>	<p>This command transmits or receives LLDP frames from the one of the ports of the server to the LLDP module.</p> <p>The no form of the command resets LLDP admin status on an interface.</p>
<b>Syntax</b>	<pre>lldp {transmit   receive} [mac-address &lt;mac_addr&gt;]</pre> <pre>no lldp {transmit   receive} [mac-address &lt;mac_addr&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>transmit</b> - Enables transmission of LLDPDU from one of the ports of the server to the LLDP module.</li> <li>• <b>receive</b> - Enables reception of LLDPDU from one of the ports of the server to the LLDP module.</li> <li>• <b>mac-address &lt;mac_addr&gt;</b> - Configures the MAC address to be used as destination MAC address by the LLDP agent on the specified port</li> </ul>
<b>Mode</b>	Interface Configuration Mode
<b>Default</b>	Transmission and Reception are enabled
	This command executes only if lldp is started
<b>Example</b>	<b>Your Product(config-if)# lldp transmit</b>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li>• <b>no shutdown lldp</b> – Starts all the ports in the LLDP and releases all the allocated memory.</li> <li>• <b>show lldp interface</b> - Displays LLDP configuration details on a particular interface or all interfaces</li> <li>• <b>show lldp statistics</b> - Displays the LLDP remote table statistics information.</li> </ul>





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## 18.12 lldp notification

<b>Command Objective</b>	This command controls the transmission of LLDP notifications.  The no form of the command disables LLDP trap notification on an interface.
<b>Syntax</b>	<pre>lldp notification [remote-table-chg][mis-configuration] [mac-address &lt;mac_addr&gt;]  no lldp notification [mac-address &lt;mac_addr&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>remote-table-chg</b> - Sends trap notification to NMS whenever remote table change occurs.</li><li>• <b>mis-configuration</b> - Sends trap notification to NMS whenever misconfiguration is identified.</li><li>• <b>mac-address &lt;mac_addr&gt;</b> - Configures the MAC address to be used as destination MAC address by the LLDP agent on the specified port</li></ul>
<b>Mode</b>	Interface Configuration Mode
<b>Default</b>	mis-configuration
	This command executes only if lldp is started
<b>Example</b>	Your Product(config-if)# lldp notification remote-table-chg
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>show lldp interface</b> - Displays LLDP configuration details on a particular interface or all interfaces</li><li>• <b>no shutdown lldp</b> – Starts all the ports in the LLDP and releases all the allocated memory.</li></ul>

## 18.13 lldp tlv-select basic-tlv

<b>Command Objective</b>	<p>This command enables the basic settings while transmitting the LLDP frames on a given port.</p> <p>The no form of the command disables the basic TLV transmission on a given port.</p>
<b>Syntax</b>	<pre>lldp tlv-select basic-tlv ( [port-descr] [sys-name] [sys-descr] [sys-capab] [mgmt-addr {all   ipv4 &lt;uicast_addr&gt;   ipv6 &lt;ip6_addr&gt;}] ) [mac-address &lt;mac_addr&gt;]no lldp tlv-select basic-tlv { [port-descr] [sys-name] [sys-descr] [sys-capab] [mgmt-addr {all   ipv4 &lt;uicast_addr&gt;   ipv6 &lt;ip6_addr&gt;}] } [mac-address &lt;mac_addr&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>port-descr</b> - Configures the port, which is a combination of interface type and interface ID. The interface ID is a combination of slot number and the port number (slot number/port number).</li> <li>• <b>sys-name</b> - Configures the system name of the TLV</li> <li>• <b>sys-descr</b> - Configures the system description of the TLV</li> <li>• <b>sys-capab</b> - Configures the system capabilities of the TLV</li> <li>• <b>mgmt-addr</b> - Enables the transmission on the current interface             <ul style="list-style-type: none"> <li>– <b>all</b> - Enables the transmission of all the available management addresses on the current interface. If no management address is present/ configured in the system, switch mac-address will be taken for transmission.</li> <li>– <b>ipv4 &lt;ip addr&gt;</b> - Enables the transmission of a particular ipv4 address on the current interface.</li> <li>– <b>ipv6 &lt;ip addr&gt;</b> - Enables the transmission of a particular ipv6 address on the current interface.</li> </ul> </li> <li>• <b>mac-address &lt;mac_addr&gt;</b> - Configures the MAC address to be used as destination MAC address by the LLDP agent on the specified port.             <ul style="list-style-type: none"> <li> Mac Address can be configured only if LLDP version is set as v2.</li> </ul> </li> </ul>
<b>Mode</b>	Interface Configuration Mode (Physical Interfaces)
	<ul style="list-style-type: none"> <li>• This command executes only if; lldp is started in the system</li> </ul>
<b>Example</b>	<pre>Your Product(config-if)# lldp tlv-select basic-tlv port-descr mgmt-addr all</pre>

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## Related Command(s)

- `no shutdown lldp` – Starts all the ports in the LLDP and releases all the allocated memory.
  - `set lldp version` - Enables the lldp version to be used on the system
  - `show lldp local` – Displays the current switch information that will be used to populate outbound LLDP advertisements for a specific interface or all interfaces
-

## 18.14 lldp port-id-subtype

<b>Command Objective</b>	This command configures an ID for LLDP port subtype
<b>Syntax</b>	<code>lldp port-id-subtype { if-alias   port-comp &lt;string(255)&gt;   mac-addr   if-name   local &lt;string(255)&gt; }</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li><b>if-alias</b> - Represents a chassis identifier based on the value of ifAlias for an interface on the containing chassis.</li> <li><b>port-comp &lt;string(255)&gt;</b> - Represents a chassis identifier based on the value of entPhysicalAlias object for a port or backplane within the chassis.</li> <li><b>mac-addr</b> - Represents a chassis identifier based on the value of a unicast source address, of a port on the containing chassis.</li> <li><b>if-name</b> - Represents a chassis identifier based on the value of ifName object for an interface on the containing chassis.</li> <li><b>local &lt;string(255)&gt;</b> - Represents a chassis identifier based on a locally defined value."</li> </ul>
<b>Mode</b>	Interface Configuration Mode
<b>Default</b>	if-alias
	This command executes only if lldp is started
<b>Example</b>	<pre>Your Product(config-if)# lldp port-id-subtype mac-addr  Your Product(config-if)# lldp port-id-subtype local slot0/1</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><b>show lldp local</b> – Displays the current switch information that will be used to populate the outbound LLDP advertisements for a specific interface or all interfaces</li> <li><b>no shutdown lldp</b> – Starts all the ports in the LLDP and releases all the allocated memory.</li> </ul>

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## 18.15 Ildp tlv-select dot1tlv

---

**Command Objective** This command performs dot1 TLV configuration while transmitting the LLDP frames to the particular port apart from the basic settings.

The no form of the command disables the transmission of dot1 TLV types on a port.

---




**Syntax**

```
lldp tlv-select dot1tlv {[port-vlan-id] [protocol-vlan-id {all | <vlan-id>}] [vlan-name {all | <vlan-id>}][vid-usage-digest] [mgmt-vid] [link-aggregation]}
```

```
no lldp tlv-select dot1tlv {[port-vlan-id] [protocol-vlan-id {all | <vlan-id>}] [vlan-name {all | <vlan-id>}][vid-usage-digest] [mgmt-vid] [link-aggregation]}
```


---

**Parameter Description**

- **port-vlan-id** - Specifies the VLAN ID of the port that uniquely identifies a specific VLAN. This VLAN ID is associated with a specific group of protocols for the specific port.
- **protocol-vlan-id** - Specifies the protocol ID that represents a specific group of protocols that are associated together when assigning a VID to a frame. This group ID is associated with the specific port.
  - **all** – Sets the protocol ID as all
  - **<vlan-id>** - Sets the protocol id as the mentioned vlan id. This value ranges between 1 and 4094.
- **vlan-name** - Specifies the administratively assigned string, which is used to identify the VLAN.
  - **all** – Sets the protocol ID as all
  - **<vlan-id>** - Sets the protocol id as the mentioned vlan id. This value ranges between 1 and 4094.
- **vid-usage-digest** - Performs dot1 TLV configuration while transmitting the LLDP frames to the VID usage digest TLV  
 This parameter can be set only when LLDP version is set as v2
- **mgmt-vid** - Performs dot1 TLV configuration while transmitting the LLDP frames to the management VID TLV  
 This parameter can be set only when LLDP version is set as v2
- **link-aggregation** - Performs dot1 TLV configuration while transmitting the LLDP frames to the link-aggregation TLV  
 This parameter can be set only when LLDP version is set as v2

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<b>Mode</b>	Interface Configuration Mode
	This command executes only if lldp is started
<b>Example</b>	<pre>Your Product(config-if)# lldp tlv-select dot1tlv port- vlan-id protocol-vlan-id 42</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>no shutdown lldp</b> – Starts all the ports in the LLDP and releases all the allocated memory.</li><li>• <b>show lldp neighbors</b> - Displays information about the neighbors on an interface or all interfaces.</li><li>• <b>show lldp local</b> – Displays the current switch information that will be used to populate outbound LLDP advertisements for a specific interface or all interfaces</li><li>• <b>show lldp errors</b> - Displays the information about the errors such as memory allocation failures, queue overflows and table overflow.</li><li>• <b>set lldp version</b> - Enables the lldp version to be used on the ports.</li></ul>

---

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## 18.16 lldp tlv-select dot3tlv

<b>Command Objective</b>	<p>This command performs dot3 TLV configuration while transmitting the LLDP frames to the particular port apart from the basic settings.</p> <p>The no form of the command disables the transmission of dot3 TLV types on a port.</p>
<b>Syntax</b>	<pre>lldp tlv-select dot3tlv { [macphy-config] [link-aggregation] [max-framesize] }  no lldp tlv-select dot3TLV { [macphy-config] [link-aggregation] [max-framesize] }</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>macphy-config</b> - Configures the physical MAC address of the TLV.</li><li>• <b>link-aggregation</b> - Configures the link aggregation protocol statistics for each port on the device.</li><li>• <b>max-framesize</b> - Configures the maximum frame size of the TLV.</li></ul>
<b>Mode</b>	Interface Configuration Mode
	This command executes only if lldp is started
<b>Example</b>	<pre>Your Product(config-if)# lldp tlv-select dot3tlv macphy-config</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>no shutdown lldp</b> – Starts all the ports in the LLDP and releases all the allocated memory.</li><li>• <b>show lldp neighbors</b> - Displays information about the neighbors on an interface or all interfaces.</li><li>• <b>show lldp local</b> – Displays the current switch information that will be used to populate outbound LLDP advertisements for a specific interface or all interfaces</li><li>• <b>show lldp errors</b> - Displays the information about the errors such as memory allocation failures, queue overflows and table overflow.</li></ul>

## 18.17 debug lldp

**Command Objective** This command specifies debug level for LLDP module.

The no form of the command disables debug option for LLDP module.

**Syntax**

```
debug lldp [{all | [init-shut] [mgmt] [data-path] [ctrl]
[pkt-dump] [resource] [all-fail] [buf] [neigh-add] [neigh-
del] [neigh-updt] [neigh-drop] [neigh-ageout]
[critical][tlv {all | [chassis-id][port-id] [ttl] [port-
descr] [sys-name] [sys-descr] [sys-capab] [mgmt-addr]
[port-vlan] [ppvlan] [vlan-name] [proto-id] [mac-phy]
[pwr-mdi] [lagg] [max-frame] [vid digest] [management
vid]]] [redundancy]]}

no debug lldp [{all | [init-shut] [mgmt] [data-path]
[ctrl] [pkt-dump] [resource] [all-fail] [buf] [neigh-add]
[neigh-del] [neigh-updt] [neigh-drop] [neigh-ageout]
[critical][tlv {all | [chassis-id][port-id] [ttl] [port-
descr] [sys-name] [sys-descr] [sys-capab] [mgmt-addr]
[port-vlan] [ppvlan] [vlan-name] [proto-id] [mac-phy]
[pwr-mdi] [lagg] [max-frame] [vid digest] [management
vid]]] [redundancy]]}
```

- Parameter Description**
- **all** - Generates debug statements for all traces
  - **init-shut** - Generates debug statements for init and shutdown traces. This trace is generated on failed initialization and shutting down of LLDP related entries.
  - **mgmt** - Generates debug statements for management traces. This trace is generated during failure in configuration of any of the LLDP features.
  - **data-path** - Generates debug statements for data path traces. This trace is generated during failure in packet processing.
  - **ctrl** - Generates debug statements for control path traces. This trace is generated during failure in modification or retrieving of LLDP entries
  - **pkt-dump** - Generates debug statements for packet dump traces. This trace is currently not used in LLDP module.
  - **resource** - Generates debug statements for OS resource related traces. This trace is generated during failure in message queues.
  - **all-fail** - Generates debug statements for all failure traces of the above mentioned traces
  - **buf** - Generates debug statements for LLDP buffer related traces. This trace is currently not used in LLDP module.




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- **neigh-add** - Generates debug statements for add SEM.
  - **neigh-del** - Generates debug statements for delete SEM.
  - **neigh-updt** - Generates debug statements for update SEM.
  - **neigh-drop** - Generates debug statements for drop SEM.
  - **neigh-ageout** - Generates debug statements for ageout SEM.
  - **critical** - Generates debug statements for critical SEM.
  - **tlv** - Generates debug statements for the following traces;
    - **all** - Generates debug statements for all TLV traces
    - **chassis-id** - Generates debug statements for chassis-id TLV traces
    - **port-id** - Generates debug statements for port-id TLV trace
    - **ttl** - Generates debug statements for TTL TLV trace
    - **port-descr** - Generates debug statements for the port description TLV traces
    - **sys-name** - Generates debug statements for the system name TLV traces
    - **sys-descr** - Generates debug statements for system description TLV traces
    - **sys-capab** - Generates debug statements for system capabilities TLV traces
    - **mgmt-addr** - Generates debug statements for management address TLV traces
    - **port-vlan** - Generates debug statements for port-vlan TLV traces
    - **ppvlan** - Generates debug statements for port-protocol-vlan TLV traces
    - **vlan-name** - Generates debug statements for vlan-name TLV traces
    - **proto-id** - Generates debug statements for protocol-id TLV traces
    - **mac-phy** - Generates debug statements for MAC or PHY TLV traces
    - **pwr-mdi** - Generates debug statements for power-through-MDI TLV traces
    - **lagg** - Generates debug statements for link aggregation TLV traces
    - **max-frame** - Generates debug statements for maximum frame size TLV traces
    - **vid digest** - Generates debug statements for vid digest TLV traces
    - **management vid** - Generates debug statements for management VID TLV traces
  - **redundancy** - Generates the debug statements for the LLDP redundancy module.
-

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<b>Mode</b>	Privileged Exec Mode
	This command executes only if lldp is started
<b>Example</b>	<pre>Your Product# debug lldp init-shut mgmt Your Product# debug lldp tlv sys-descr lagg Your Product# debug lldp</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>no shutdown lldp</code> – Starts all the ports in the LLDP and releases all the allocated memory.</li></ul>

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## 18.18 show lldp

<b>Command Objective</b>	This command displays LLDP global configuration details to initialize on an interface.
<b>Syntax</b>	<code>show lldp</code>
<b>Mode</b>	Privileged EXEC Mode
	This command executes only if lldp is started
<b>Example</b>	<pre>Your Product# show lldp LLDP is enabled LLDP Version           : v2 Transmit Interval      : 20 Holdtime Multiplier    : 4 Reinitialization Delay : 2 Tx Delay               : 2 Notification Interval  : 30 TxCreditMax           : 5 MessageFastTx         : 1 TxFastInit            : 4 Chassis Id SubType     : Chassis Component Chassis Id             : Aricentswitch</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>set lldp</code> - Enables or disables LLDP on the system.</li><li>• <code>lldp transmit-interval</code> - Sets the transmission interval</li><li>• <code>lldp holdtime-multiplier</code> - Sets the multiplier value</li><li>• <code>lldp reinitialization-delay</code> - Sets the reinitialization delay</li><li>• <code>lldp tx-delay</code> - Sets the transmit delay</li><li>• <code>lldp notification-interval</code> - Sets the notification interval</li><li>• <code>lldp chassis-id-subtype</code> - Configures lldp chassis id subtype and chassis id value</li><li>• <code>no shutdown lldp</code> - Starts all the ports in the LLDP and releases all the allocated memory.</li></ul>


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- **set lldp version** – Enables the lldp version to be used on the system.
  - **lldptxCreditMax** – Configures the maximum number of consecutive LLDPDUs that can be transmitted any time
  - **lldp MessageFastTx** – Configures the interval at which LLDP frames are transmitted on behalf of this LLDP agent during fast transmission period
  - **lldp txFastInit** - Configures the value used to initialize the txFast variable which determines the number of transmissions that are made in fast transmission mode
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## 18.19 show lldp interface

<b>Command Objective</b>	This command displays the information about interfaces where LLDP is enabled .
<b>Syntax</b>	<code>show lldp interface [&lt;interface-type&gt; &lt;interface-id&gt;] [mac-address &lt;mac_addr&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;interface-type&gt;</b> - Displays the information about the specified type of interface. The interface can be:<ul style="list-style-type: none"><li>– qx-ethernet – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.</li><li>– gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.</li><li>– extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.</li><li>– port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.</li></ul></li><li>• <b>&lt;interface-id&gt;</b> - Displays the information about the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. For Example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided, for interface type port-channel. ForExample: 1 represents port-channel ID.</li><li>• <b>mac-address &lt;mac_addr&gt;</b> - Displays information about neighbors for the specidified destination MAC address of the LLDP agent</li></ul>
<b>Mode</b>	Privileged EXEC Mode
	This command executes only if lldp is started
<b>Example</b>	<pre>Your Product# show lldp interface gigabitethernet 0/1 Gi0/1: Tx State           : Enabled Rx State           : Enabled Tx SEM State       : INITIALIZE Rx SEM State       : INITIALIZE Notification Status : Disabled Notification Type  : Mis-configuration</pre>

# Supermicro Switch Configuration CLI Guide

---

`DestinationMacAddr : 01:80:c2:00:00:0e`


---

**Related Command(s)**

- `set lldp` - Enables or disables LLDP on the system
  - `lldp transmit / receive` - Sets LLDP admin status on an interface to Transmit or Receive
  - `lldp notification` - Enables LLDP trap notification on an interface
  - `no shutdown lldp` – Starts all the ports in the LLDP and releases all the allocated memory.
  - `lldp dest-mac` - Configures destination mac-address to be used by the LLDP agent for transmission on this port.
-

# Supermicro Switch Configuration CLI Guide

## 20.20 show lldp neighbors

<b>Command Objective</b>	This command displays information about neighbors on an interface or all interfaces.
<b>Syntax</b>	<code>show lldp neighbors [chassis-id &lt;string(255)&gt; port-id &lt;string(255)&gt;] [&lt;interface-type&gt; &lt;interface-id&gt;][detail]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>chassis-id &lt;string(255)&gt;</b> - Displays LLDP Neighbor information for the specified chassis identifier value. This value is a string value with a maximum size of 255.</li><li>• <b>port-id &lt;string(255)&gt;</b> - Displays LLDP Neighbor information for the specified port number that represents the concerned aggregation port. This value is a string value with a maximum size of 255.</li><li>• <b>&lt;interface-type&gt;</b> - Displays information about neighbors for the specified type of interface. The interface can be:<ul style="list-style-type: none"><li>– qx-ethernet – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.</li><li>– gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.</li><li>– extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.</li></ul></li><li>• <b>&lt;interface-id&gt;</b> - Displays information about neighbors for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. For Example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided, for interface type port-channel. For Example: 1 represents port-channel ID.</li><li>• <b>detail</b> - Displays the information obtained from all the received TLVs.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
	This command can be executed only if lldp is started
<b>Example</b>	<pre>Your Product# show lldp neighbors Capability Codes   : (R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device, (W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other Chassis ID      Local Intf  Hold-time   Capability   Port Id</pre>

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```
-----  
00:01:02:03:04:01 Gi0/1      120      B,R      Slot0/1  
00:02:02:03:04:01 Gi0/2      120      Slot0/3  
00:02:02:03:04:01 Gi0/3      120      Slot0/2  
00:01:02:03:04:01 Gi0/2      120      Slot0/2  
00:01:02:03:04:01 Gi0/3      120      Slot0/2
```

Total Entries Displayed : 5

Your Product# show lldp neighbors chassis-id  
00:01:02:03:04:01 port-id Slot0/2

Capability Codes :

(R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device,

(W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other

```
Chassis ID   Local Intf   Hold-time   Capability   Port Id  
-----  
00:01:02:03:04:01 Gi0/2      120      Slot0/2  
00:01:02:03:04:01 Gi0/3      120      Slot0/2
```

Total Entries Displayed : 2

Your Product# show lldp neighbors chassis-id  
00:01:02:03:04:01 port-id Slot0/2 gigabitethernet 0/2

Capability Codes :

(R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device,

(W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other

```
Chassis ID   Local Intf   Hold-time   Capability   Port Id  
-----  
00:01:02:03:04:01 Gi0/2      120      slot0/2
```

Total Entries Displayed : 1

Your Product# show lldp neighbors chassis-id  
00:01:02:03:04:01 port-id Slot0/2 detail

Capability Codes :

(R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device,

(W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other

```
Chassis Id SubType           : Mac Address  
Chassis Id                   : 00:01:02:03:04:01  
Port Id SubType              : Interface Alias  
Port Id                       : Slot0/2
```



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---

---

```
Port Description           : Not Advertised
System Name                : Not Advertised
System Desc                : Not Advertised
Local Intf                 : Gi0/2
Time Remaining             : 92 Seconds
System Capabilities Tlv    : Not Advertised
Management Addresses       : Not Advertised
Extended 802.3 TLV Info
-MAC PHY Configuration & Status
Auto Negotiation Tlv       : Not Advertised
-Link Aggregation
Link Aggregation Tlv       : Not Advertised
-Maximum Frame Size Tlv    : Not Advertised
Extended 802.1 TLV Info
-Port VLAN Id              : 0
-Port & Protocol VLAN Id
Protocol Vlan Tlv          : Not Advertised
-Vlan Name
Vlan Id      Vlan Name
-----      -
```

---

```
Chassis Id SubType        : Mac Address
Chassis Id                 : 00:01:02:03:04:01
Port Id SubType            : Interface Alias
Port Id                    : Slot0/2
Port Description           : Not Advertised
System Name                : Not Advertised
System Desc                : Not Advertised
Local Intf                 : Gi0/3
Time Remaining             : 92 Seconds
System Capabilities Tlv    : Not Advertised
Management Addresses       : Not Advertised
Extended 802.3 TLV Info
-MAC PHY Configuration & Status
Auto Negotiation Tlv       : Not Advertised
-Link Aggregation
Link Aggregation Tlv       : Not Advertised
```

---

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```
-Maximum Frame Size Tlv      : Not Advertised
Extended 802.1 TLV Info
-Port VLAN Id                : 0
-Port & Protocol VLAN Id
Protocol Vlan Tlv            : Not Advertised
-Vlan Name
Vlan Id      Vlan Name
-----
-----
```

Total Entries Displayed : 2

**Your Product# show lldp neighbors gigabitethernet 0/1 detail**

```
Capability Codes      :
(R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable
Device,
(W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other
Chassis Id SubType    : Mac Address
Chassis Id            : 00:01:02:03:04:01
Port Id SubType       : Interface Alias
Port Id              : Slot0/1
Port Description      : Ethernet Interface
System Name          : SMIS
System Desc          : SNMPV2
Local Intf           : Gi0/1
Time Remaining       : 95 Seconds
System Capabilities Supported : B,R
System Capabilities Enabled  : B,R
Management Addresses  :
IfId SubType Address          OID
-----
33  IPv4      12.0.0.1          1 3 6 1 2 1 2 2 1
1
Extended 802.3 TLV Info
-MAC PHY Configuration & Status
Auto-Neg Support & Status    : Supported, Disabled
Advertised Capability Bits   : 8000
Other
-Link Aggregation
```

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---

```
Capability & Status           : Not Capable, Not In
Aggregation

Aggregated Port Id           : 1
-Maximum Frame Size         : 1500
Extended 802.1 TLV Info
-Port VLAN Id                : 1
-Port & Protocol VLAN Id
Protocol Vlan Id             Support      Status
-----
1                             Supported  Enabled
2                             Supported  Enabled
30                            Supported  Enabled
-Vlan Name
Vlan Id      Vlan Name
-----
1            vlan1
2            vlan2
30           vlan30
```

---

Total Entries Displayed : 1

---

## Related Command(s)

- **no shutdown lldp** – Starts all the ports in the LLDP and releases all the allocated memory.
  - **set lldp** - Enables or disables LLDP on the system
  - **clear lldp table** - Clears all the LLDP table of information about the neighbors.
  - **lldp tlv-select basic-tlv** – Configures basic TLV types to be transmitted on a given port
  - **lldp tlv-select dot1tlv** – Configures dot1 TLV types to be transmitted on a port
  - **lldp tlv-select dot3tlv** - Configures dot3 TLV types to be transmitted on a port
-

## 18.21 show lldp traffic

---

**Command Objective** This command displays LLDP counters on all interfaces or on a specific interface. This includes the following:

- Total Frames Out
- Total Entries Aged
- Total Frames In
- Total Frames Received In Error
- Total Frames Discarded
- Total TLVS Unrecognized
- Total TLVs Discarded

---

**Syntax** `show lldp traffic [<iftype> <ifnum>[mac-address <mac_addr>]]`

---

**Parameter Description**

- **<iftype>** - Displays the LLDP counters for specified type of interface. The interface can be:
  - qx-ethernet – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.
  - gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
  - extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.
  - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
- **<ifnum>** - Displays the LLDP counters for specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. For Example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided, for interface type port-channel. For Example: 1 represents port-channel ID
- **mac-address <mac\_addr>** - Displays information about neighbors for the specified destination MAC address of the LLDP agent


---

# Supermicro Switch Configuration CLI Guide

---

<b>Mode</b>	Privileged EXEC Mode
	This command executes only if lldp is started
<b>Example</b>	<pre>Your Product# show lldp traffic Total Frames Out           : 107 Total Entries Aged         : 0 Total Frames In           : 159 Total Frames Received In Error : 0 Total Frames Discarded     : 0 Total TLVS Unrecognized    : 0 Total TLVS Discarded       : 0  Your Product# show lldp traffic gigabitethernet 0/1 Total Frames Out           : 49 Total Entries Aged         : 0 Total Frames In           : 42 Total Frames Received In Error : 0 Total Frames Discarded     : 0 Total TLVS Unrecognized    : 0 Total TLVS Discarded       : 0 Total PDU length error Drops : 0</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>no shutdown lldp</b> – Starts all the ports in the LLDP and releases all the allocated memory.</li><li>• <b>set lldp</b> - Enables or disables LLDP on the system</li><li>• <b>clear lldp counters</b> - Clears the entire interface related transmit and receive counters.</li></ul>

## 18.22 show lldp local

<b>Command Objective</b>	This command displays the current switch information that will be used to populate outbound LLDP advertisements for a specific interface or all interfaces.
<b>Syntax</b>	<code>show lldp local {[&lt;interface-type&gt; &lt;interface-id&gt; [mac-address &lt;mac_addr&gt;]]   [mgmt-addr]}</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>&lt;interface-type&gt;</b> - Displays the current switch information for the specified type of interface. The interface can be: <ul style="list-style-type: none"> <li>– qx-ethernet – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>– gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.</li> <li>– extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>– port-channel – Logical interface that represents an aggregator which contains several ports aggregated together</li> </ul> </li> <li>• <b>&lt;interface-id&gt;</b> - Displays the current switch information for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. For Example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided, for interface type port-channel. For Example: 1 represents port-channel ID.</li> <li>• <b>mac-address &lt;mac_addr&gt;</b> - Displays information about neighbors for the specified destination MAC address of the LLDP agent</li> <li>• <b>mgmt-addr</b> - All the management addresses configured in the system and Tx enabled ports</li> </ul>
<b>Mode</b>	Privileged EXEC Mode
	This command can be executed only if lldp is started
<b>Example</b>	<pre>Your Product# show lldp local Capability Codes      : (R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device, (W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other Chassis Id SubType   : Mac Address Chassis Id           : 00:02:02:03:04:01 System Name          : SMIS</pre>

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---

```
System Description           : SNMPV2
System Capabilities Supported : B,R
System Capabilities Enabled  : B,R

Gi0/1 :
Port Id SubType             : Interface Alias
Port Id                     : Gi0/1
Port Description            : Ethernet Interface Port 01
Enabled Tx Tlvs             : Port Description, System
Description,
                             Management Address

Extended 802.3 TLV Info
-MAC PHY Configuration & Status
Auto-Neg Support & Status   : ,
Advertised Capability Bits   : b24e
Other
10base-T(FD)
100base-T4
100base-T2(HD)
Asym PAUSE(FD)
1000base-X, -LX, -SX, -CX(HD)
1000base-X, -LX, -SX, -CX(FD)
1000base-T(HD)
Operational MAU Type        : 0
-Link Aggregation
Capability & Status          : Not Capable, Not In
Aggregation
Aggregated Port Id          : 0
-Maximum Frame Size         : 1500

Extended 802.1 TLV Info
-Port VLAN Id               : 1
-Port & Protocol VLAN Id
Protocol VLAN Id    Support  Protocol VLAN Status  TxStatus
-----
0                   Supported  Enabled              Disabled
```

---

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```
-----
1                Supported  Enabled          Disabled
-Vlan Name
Vlan Id          Vlan Name          TxStatus
-----
1                Disabled
-VID TLV:
VID              TxStatus
-----
0                Disabled
-Management Vid TLV:
Vlan Id          TxStatus
-----
1                Disabled
-----
```

**Your Product# show lldp local gigabitethernet 0/1**

```
Port Id SubType      : Interface Alias
Port Id              : Slot0/1
Port Description     : Ethernet Interface
Enabled Tx Tlvs     : Port Description, System Name,
                    System Description, System Capability,
                    Management Address, Port Vlan, Mac
Phy,
                    Link Aggregation, Max Frame Size
Extended 802.3 TLV Info
-MAC PHY Configuration & Status
Auto-Neg Support & Status : Supported, Disabled
Advertised Capability Bits : 8000
Other
Operational MAU Type      : 0
-Link Aggregation
Capability & Status       : Not Capable, Not In
Aggregation
Aggregated Port Id       : 1
-Maximum Frame Size      : 1500
Extended 802.1 TLV Info
-Port VLAN Id           : 1
-Port & Protocol VLAN Id
```



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```

Protocol VLAN Id   Support   Protocol VLAN Status
TxStatus
-----
-
1                 Supported Enabled      Enabled
2                 Supported Enabled      Enabled
30                Supported Enabled      Enabled
-Vlan Name
Vlan Id           Vlan Name           TxStatus
-----
1                 vlan1                Enabled
2                 vlan2                Enabled
30                vlan3                Enabled
-----

```

Your Product# `show lldp local mgmt-addr`

```

Management Address           TxEnabledPorts
-----
13.0.0.1                     Gi0/1
15.0.0.1                     Gi0/1

```

## Related Command(s)

- `no shutdown lldp` – Starts all the ports in the LLDP and releases all the allocated memory.
- `set lldp` - Enables or disables LLDP on the system
- `lldp chassis-id-subtype` - Configures lldp chassis id subtype and chassis id value
- `lldp port-id-subtype` - Configures lldp port id subtype and port id value for a given port
- `lldp tlv-select basic-tlv` – Configures basic TLV types to be transmitted on a given port
- `lldp tlv-select dot1tlv` – Configures dot1 TLV types to be transmitted on a port
- `lldp tlv-select dot3tlv` - Configures dot3 TLV types to be transmitted on a port

## 18.23 show lldp errors

---

<b>Command Objective</b>	This command displays the information about the errors such as memory allocation failures, queue overflows and table overflow.
--------------------------	--

---

<b>Syntax</b>	<code>show lldp errors</code>
---------------	-------------------------------

---

<b>Mode</b>	Privileged EXEC Mode
-------------	----------------------

---

<b>Example</b>	<pre>Your Product# show lldp errors Total Memory Allocation Failures : 0 Total Input Queue Overflows      : 0 Total Table Overflows            : 0</pre>
----------------	--

---



This command can be executed only if lldp is started

---


### Related Command(s)

- `no shutdown lldp` – Starts all the ports in the LLDP and releases all the allocated memory.
  - `set lldp` - Enables or disables LLDP on the system
  - `lldp tlv-select basic-tlv` – Configures basic TLV types to be transmitted on a given port
  - `lldp tlv-select dot1tlv` – Configures dot1 TLV types to be transmitted on a port
  - `lldp tlv-select dot3tlv` - Configures dot3 TLV types to be transmitted on a port
-


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---

## 18.24 show lldp statistics

<b>Command Objective</b>	This command displays the LLDP remote table statistics information.
<b>Syntax</b>	<code>show lldp statistics</code>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show lldp statistics Remote Table Last Change Time : 100300 Remote Table Inserts           : 5 Remote Table Deletes           : 0 Remote Table Drops             : 0 Remote Table Ageouts           : 0 Remote Table Updates           : 4</pre>
	This command can be executed only if lldp is started
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>set lldp</code> - Enables or disables LLDP on the system</li><li>• <code>lldp transmit / receive</code> - Sets LLDP admin status on an interface to transmit / receive</li><li>• <code>no shutdown lldp</code> – Starts all the ports in the LLDP and releases all the allocated memory.</li></ul>


## 18.25 lldp dest-mac

<b>Command Objective</b>	<p>This command configures destination mac-address to be used by the LLDP agent for transmission on this port.</p> <p>The no form of the command resets the destination mac-address to LLDP multicast address .</p>
<b>Syntax</b>	<pre>lldp dest-mac &lt;mac_addr&gt;</pre> <pre>no lldp dest-mac &lt;mac_addr&gt;</pre>
<b>Mode</b>	Interface Configuration Mode (Physical Interfaces)
<b>Default</b>	The default value would be the LLDP multicast MAC address
	This command can be executed only if lldp is started.
<b>Example</b>	<pre>Your Product(config-if)# lldp dest-mac 00:11:22:33:44:55</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>no shutdown lldp</code> - Enables all the ports by allocating the required resources in the LLDP.</li><li>• <code>show lldp interface</code> - Displays the information about interfaces where LLDP is enabled</li></ul>


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---

## 18.26 set lldp version

<b>Command Objective</b>	This command enables the lldp version to be used on the system.
<b>Syntax</b>	<code>set lldp version {v1   v2}</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>v1</code> - Enables LLDP 2005 version 1 on the port</li><li>• <code>v2</code> - Enables LLDP 2009 version 2 on the port</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	v1
	This command executes only if lldp is started
<b>Example</b>	<code>Your Product(config)# set lldp version v1</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>no shutdown lldp</code> – Starts all the ports in the LLDP and releases all the allocated memory.</li><li>• <code>show lldp</code> - Displays LLDP global configuration details to initialize on an interface</li></ul>

## 18.27 Ildp txCreditMax

<b>Command Objective</b>	This command configures the maximum number of consecutive LLDPDUs that can be transmitted any time. This value ranges between 1 and 10.
<b>Syntax</b>	<code>lldp txCreditMax &lt;value (1-10)&gt;</code>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	5
 <b>Tip</b>	This command executes only if lldp is started
<b>Example</b>	<code>Your Product(config)# lldp txCreditMax 3</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>no shutdown lldp</code> – Starts all the ports in the LLDP and releases all the allocated memory.</li><li>• <code>show lldp</code> - Displays LLDP global configuration details to initialize on an interface</li></ul>

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---

## 18.28 Ildp MessageFastTx

---

<b>Command Objective</b>	This command configures the interval at which LLDP frames are transmitted on behalf of this LLDP agent during fast transmission period. This value ranges between 1 and 3600 seconds.
--------------------------	---

---

<b>Syntax</b>	<code>lldp MessageFastTx &lt;seconds(1-3600)&gt;</code>
---------------	---

---

<b>Mode</b>	Global Configuration Mode
-------------	---------------------------

---

<b>Default</b>	1
----------------	---

---



This command executes only if lldp is started

---


<b>Example</b>	<code>Your Product(config)# lldp MessageFastTx 3500</code>
----------------	--

---

<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>no shutdown lldp</code> – Starts all the ports in the LLDP and releases all the allocated memory.</li><li>• <code>show lldp</code> - Displays LLDP global configuration details to initialize on an interface</li></ul>
---------------------------	---

---

## 18.29 lldp txFastInit


<b>Command Objective</b>	This command configures the value used to initialize the txFast variable which determines the number of transmissions that are made in fast transmission mode. This value ranges between 1 and 8.
<b>Syntax</b>	<code>lldp txFastInit &lt;value (1-8)&gt;</code>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	4
	This command executes only if lldp is started
<b>Example</b>	<code>Your Product(config)# lldp txFastInit 3</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>no shutdown lldp</code> – Starts all the ports in the LLDP and releases all the allocated memory.</li><li>• <code>show lldp</code> - Displays LLDP global configuration details to initialize on an interface</li></ul>



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---

## 18.30 show lldp peer

<b>Command Objective</b>	This command displays information about the peers on an interface or all interfaces.
<b>Syntax</b>	<pre>show lldp peers [chassis-id &lt;string(255)&gt; port-id &lt;string(255)&gt;] &lt;interface-type&gt; &lt;interface-id&gt;[[mac-address &lt;mac_addr&gt;] [detail]]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>chassis-id &lt;string(255)&gt;</b> - Displays the LLDP peer information for the specified chassis identifier. This value is a string of maximum size 255.</li><li>• <b>port-id &lt;string(255)&gt;</b> - Displays the port number that represents the concerned aggregation port. This value is a string of maximum size 255.</li><li>• <b>&lt;interface-type&gt;</b> - Displays information about LLDP peers for the specified type of interface. The interface can be:<ul style="list-style-type: none"><li>– qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.</li><li>– gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.</li><li>– extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.</li></ul></li><li>• <b>&lt;interface-id&gt;</b> - Displays information about peers for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. For Example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided, for interface type port-channel. For Example: 1 represents port-channel ID.</li><li>• <b>mac-address &lt;mac_addr&gt;</b> - Displays information about peers for the specified destination MAC address of the LLDP agent.</li><li>• <b>detail</b> - Displays the information obtained from all the received TLVs.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
	This command can be executed only if lldp is started
<b>Example</b>	<pre>Your Product # show lldp peers gigabitethernet 0/1 Capability Codes      : (R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable</pre>

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Device,

(W) WLAN Access Point, (P) Repeater, (S) Station, (O)  
Other

Chassis ID	Local Intf	Hold-time	Capability	Port Id
00:01:02:03:04:01	Gi0/1	120	B,R	Slot0/1

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## Related Command(s)

- **no shutdown lldp** – Starts all the ports in the LLDP and releases all the allocated memory.
  - **set lldp** - Enables or disables LLDP on the system
  - **clear lldp table** - Clears all the LLDP table of information about the neighbors.
  - **lldp tlv-select basic-tlv** – Configures basic TLV types to be transmitted on a given port
  - **lldp tlv-select dot1tlv** – Configures dot1 TLV types to be transmitted on a port
  - **lldp tlv-select dot3tlv** - Configures dot3 TLV types to be transmitted on a port
-

## Chapter 19

### VLAN

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**VLANs (Virtual LANs)** can be viewed as a group of devices on different physical LAN segments which can communicate with each other as if they were all on the same physical LAN segment, that is, a network of computers that behave as if they are connected to the same wire even though they may actually be physically located on different segments of a LAN. VLANs are configured through software rather than hardware, which make them extremely flexible.

VLAN provides the following benefits for switched LANs:

- Improved administration efficiency
- Optimized Broadcast/Multicast Activity
- Enhanced network security

The prompt for the switch configuration mode is,

```
Your Product(config)#
```

The prompt for the Config VLAN mode is,

```
Your Product(config-vlan)#
```

The list of commands for the configuration of VLAN is as follows:

- [shutdown vlan](#)
- [vlan](#)
- [set mac-learning](#)
- [base bridge-mode](#)
- [mac-vlan](#)
- [subnet-vlan](#)

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- [protocol-vlan](#)
- [map protocol](#)
- [set vlan traffic-classes](#)
- [mac-address-table static unicast – Transparent Bridging Mode](#)
- [mac-address-table static multicast](#)
- [mac address-table static mcast](#)
- [mac-address-table static multicast – Transparent Bridging mode](#)
- [mac-address-table aging-time](#)
- [clear vlan statistics](#)
- [wildcard](#)
- [unicast-mac learning limit](#)
- [map subnet](#)
- [ports](#)
- [vlan active](#)
- [set unicast-mac learning](#)
- [interface range](#)
- [vlan unicast-mac learning limit](#)
- [switchport pvid](#)
- [switchport access vlan](#)
- [switchport acceptable-frame-type](#)
- [switchport ingress-filter](#)
- [protocol-vlan](#)
- [switchport map protocols-group](#)
- [switchport priority default](#)
- [switchport mode](#)
- [vlan max-traffic-class](#)
- [vlan map-priority](#)
- [mac-map](#)
- [switchport filtering-utility-criteria](#)
- [switchport protected](#)
- [debug vlan](#)
- [show vlan](#)
- [show vlan device info](#)
- [show vlan device capabilities](#)
- [show vlan traffic-classes](#)
- [show vlan port config](#)
- [show vlan protocols-group](#)
- [show protocol-vlan](#)
- [show mac-vlan](#)
- [show subnet vlan mapping](#)

- [show vlan statistics](#)
- [show vlan learning params](#)
- [show mac-address-table](#)
- [show dot1d mac-address-table](#)
- [show mac-address-table count](#)
- [show mac-address-table static unicast](#)
- [show dot1d mac-address-table static unicast](#)
- [show mac-address-table static multicast](#)
- [show dot1d mac-address-table static multicast](#)
- [show mac-address-table dynamic unicast](#)
- [show mac-address-table dynamic multicast](#)
- [show mac-address-table aging-time](#)
- [show wildcard](#)
- [shutdown garp](#)
- [set gvrp](#)
- [set port gvrp](#)
- [set port gvrp - enable | disable](#)
- [set gmrp](#)
- [set port gmrp](#)
- [set garp timer](#)
- [vlan restricted](#)
- [group restricted](#)
- [debug garp](#)
- [show garp timer](#)
- [switchport unicast-mac learning](#)
- [private-vlan](#)
- [private-vlan association](#)
- [switchport private-vlan host-association](#)
- [switchport private-vlan mapping](#)
- [show vlan private-vlan](#)
- [set filtering-utility-criteria](#)
- [set sw-stats](#)
- [set vlan counter](#)
- [clear mac-address-table dynamic](#)
- [debug vlan global](#)
- [show gmrp statistics](#)
- [show gvrp statistics](#)

## 19.1 shutdown vlan

**Command Objective** This command shuts down the VLAN switching feature in the switch and releases all resources allocated to the VLAN feature.

The no form of the command starts and enables VLAN switching feature in the switch. The resources required for the VLAN feature are also allocated to it.

The VLAN feature allows you to logically segment a shared media LAN for forming virtual workgroups.

**Syntax** `shutdown vlan`  
`no shutdown vlan`

**Mode** Global Configuration Mode

**Default** VLAN switching feature is started and enabled in the switch.



- VLAN module can be shutdown, only if the GARP module is shutdown.
- VLAN switching configuration is not allowed in the switch, if the base bridge mode is set as transparent bridging.

**Example** `Your Product(config)# shutdown vlan`

- Related Command(s)**
- `set vlan` - Globally enables / disables VLAN feature in the switch (that is the status of the VLAN feature is configured for all ports of the switch).
  - `vlan` - Creates a VLAN in the ISS and enters into the config-VLAN mode in which VLAN specific configurations are done.
  - `base bridge-mode` - Configures the base mode (either 802.1d transparent bridge mode or 802.1q vlan aware bridge mode) in which the VLAN feature should operate on the switch.
  - `mac-vlan` - Enables MAC-based VLAN membership classification on all ports of the switch.
  - `subnet-vlan` - Enables subnet-VLAN based membership classification on all ports of the switch.
  - `protocol-vlan` - Enables protocol-VLAN based membership classification on all ports of the switch.
  - `map protocol` - Creates a protocol group with a specific protocol and encapsulation frame type combination.

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- **set gvrp** – Globally enables / disables GVRP feature on all ports of a switch.
- **set gmrp** – Globally enables / disables GMRP feature on all ports of a switch.
- **set vlan traffic-classes** - Enables or disables traffic class feature in a switch on all ports.
- **mac-map** - Configures the VLAN-MAC address mapping that is used only for MAC-based VLAN membership classification.
- **map subnet** - Configures VLAN-IP subnet address mapping that is used only for subnet-VLAN based membership classification.
- **switchport filtering-utility-criteria** - Creates filtering utility criteria for the port.
- **switchport protected** - Enables switchport protection feature for a port.
- **mac-address-table aging-time** - Configures the timeout period (in seconds) for aging out dynamically learned forwarding information entry and static entry in the MAC address table.
- **clear vlan statistics** - Clears VLAN counters that maintain statistics information on a per VLAN basis. The counter is cleared for all available VLANs or for the specified VLAN.
- **vlan default hybrid type** - Configures the default hybrid learning mode for all VLANs when the operational learning mode of the switch is globally set as hybrid.
- **wildcard** - Configures the wildcard VLAN entry for a specified MAC address or any MAC address.
- **unicast-mac learning limit** - Configures the unicast-MAC learning limit for a switch.
- **switchport pvid** - Configures the PVID on the specified port.
- **switchport acceptable-frame-type** - Configures the type of VLAN dependant BPDU frames such as GMRP BPDU, that the port should accept during the VLAN membership configuration.
- **switchport ingress-filter** - Enables ingress filtering feature on the port.
- **port protocol-vlan** - Enables protocol-VLAN based membership classification in a port.
- **switchport map protocols-group** - Maps the configured protocol group to a particular VLAN ID for an interface.

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- **switchport priority default** - Configures the default ingress user priority for a port.
- **switchport mode** - Configures the mode of operation for a switch port.
- **vlan max-traffic-class** - Configures the maximum number of traffic classes supported on a port.
- **vlan map-priority** - Maps an evaluated user priority to a traffic class on a port.
- **shutdown garp** - Shuts down the GARP module in the switch on all ports and releases all memories used for the GARP module.
- **debug vlan** - Enables the tracing of the VLAN submodule as per the configured debug levels.
- **show vlan** - Displays VLAN entry related information of all active VLANs and VLANs (that are not active) for which the port details are configured.
- **show vlan device info** - Displays the VLAN global information that is applicable to all VLANs created in the switch / all contexts.
- **show vlan device capabilities** - Displays only the list of VLAN features such as traffic class feature, supported in the switch / all contexts.
- **show vlan traffic-classes** - Displays the evaluated user priority and traffic class mapping information of all interfaces available in the switch / all contexts.
- **show garp timer** - Displays the GARP timer information of all interfaces available in the switch / all contexts.
- **show vlan port config** - Displays the VLAN related port specific information for all interfaces available in the switch / all contexts.
- **show vlan protocols-group** - Displays all entries in the protocol group table.
- **show protocol-vlan** - Displays all entries in the port protocol table.
- **show mac-vlan** - Displays all entries in the MAC map table.
- **show subnet-vlan mapping** - Displays all entries in the subnet map table.
- **show vlan statistics** - Displays the unicast / broadcast statistics details of all active VLANs and VLANs (that are not active) for which the port details are configured.
- **show mac-address-table** - Displays all static / dynamic unicast and multicast MAC entries created in the MAC address table.



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- **show dot1d mac-address-table** - Displays all static / dynamic unicast and multicast MAC address entries created in the FDB table, when the VLAN base bridge mode is transparent bridging.
  - **show dot1d mac-address-table static unicast**- Displays all static unicast MAC address entries created in the FDB table, when the VLAN base bridge mode is transparent bridging.
  - **show dot1d mac-address-table static multicast** - Displays all static multicast MAC address entries created in the FDB table, when the VLAN base bridge mode is transparent bridging.
  - **show mac-address-table count** - Displays the total number of static / dynamic unicast and multicast MAC address entries created in the FDB table.
  - **show mac-address-table static unicast** - Displays all static unicast MAC address entries created in the FDB table.
  - **show mac-address-table static multicast** - Displays the static multicast MAC address entries created in the FDB table.
  - **show mac-address-table dynamic unicast** - Displays all dynamically learnt unicast entries from the MAC address table.
  - **show mac-address-table dynamic multicast** - Displays all dynamically learnt multicast entries from the MAC address table.
  - **show mac-address-table aging-time** - Displays the ageing time configured for the MAC address table.
  - **show wildcard** - Displays all wildcard MAC entries created in the switch / in all contexts.
  - **show vlan learning params** - Displays the VLAN learning parameter details for all active VLANs and VLANs (that are not active) for which the port details are configured, available in all contexts / in the switch.
-

## 19.2 vlan

**Command Objective** This command creates a VLAN / VFI ID and enters into the config-VLAN mode in which VLAN specific configurations are done. This command directly enters into the config-VLAN mode for the specified VLAN / VFI ID, if the VLAN is already created.

- **<vlan -id>** - This is a unique value that represents the specific VLAN. This value ranges between 1 and 4094
- **<vfi-id>** - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This feature is not available in SMIS switch models.

 The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.

 The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.

The no form of the command deletes the existing VLAN/ VFI and its corresponding configurations.

**Syntax**

```
vlan <vlan-id/vfi_id>
no vlan <vlan-id/vfi_id>
```

**Mode** Global Configuration Mode

**Default** By default VLAN 1 is created



- The Native VLAN (VLAN 1) created by default cannot be deleted using the no form of the command.
- For default VLAN 1, interface VLAN configuration alone is permitted and no other configuration on this VLAN is allowed, if the base bridge mode is set as transparent bridging. No new VLAN can be created, if the base bridge mode is set as transparent bridging
- The creation of new VLAN and configuration of existing VLAN can be done, only if the VLAN switching feature is started and enabled in the switch.

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**Example**

```
Your Product(config)# vlan 4Your
```

```
Product(config-vlan)#
```

---

**Related Command(s)**

- **base bridge-mode** - Configures the base mode (either 802.1d transparent bridge mode or 802.1q vlan aware bridge mode) in which the VLAN feature should operate on the switch.
  - **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
  - **interface vlan <vlan-id>** - Creates an L3 VLAN interface. An L3 VLAN interface is a VLAN that is mapped to an IP interface and assigned an IP address.
  - **show vlan** - Displays VLAN entry related information of all active VLANs and VLANs (that are not active) for which the port details are configured.
-

## 19.3 set mac-learning


<b>Command Objective</b>	This command configures the global mac learning status.
<b>Syntax</b>	<code>set mac-learning { enable   disable }</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>enable</code> - Enables the global mac learning status</li><li>• <code>disable</code> - Disables the global mac learning status</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	enable
<b>Example</b>	<code>Your Product(config)# set mac-learning enable</code>

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# Supermicro Switch Configuration CLI Guide

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## 19.4 base bridge-mode

<b>Command Objective</b>	This command configures the base mode (either 802.1d transparent bridge mode or 802.1q vlan aware bridge mode) in which the VLAN feature should operate on the switch. This configuration is globally applied on all ports of the switch.
<b>Syntax</b>	<code>base bridge-mode { dot1d-bridge   dot1q-vlan }</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li><b>dot1d-bridge</b> - Configures the VLAN operation mode as transparent bridging. The switch operates according to IEEE 802.1q implementation. This mode allows you to connect two similar network segments to each other at the datalink layer in a manner transparent to end stations, so the end stations do not participate in the bridging algorithm. The mode can be set as transparent bridging, only if the following conditions are satisfied:<ul style="list-style-type: none"><li>GARP, IGS, MLDS, LA, and LLDP are shutdown.</li><li>Spanning tree mode is set as RSTP or spanning tree is shutdown.</li><li>All logical interfaces such as loopback, are deleted. The default L3 VLAN interface is also deleted.</li></ul></li><li><b>dot1q-vlan</b> - Configures the VLAN operation mode as VLAN aware bridging. The switch operates according to IEEE 802.1d implementation. This mode allows you to interconnect end stations at different LAN segments and communicate with each other using VLANs.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	dot1q-vlan (VLAN aware bridging)
	The VLAN mode can be configured, only if the VLAN switching feature is started and enabled in the switch.
<b>Example</b>	<code>Your Product(config)# base bridge-mode dot1d-bridge</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><code>shutdown garp</code> - Shuts down the GARP module in the switch on all ports and releases all memories used for the GARP module..</li><li><code>shutdown snooping</code> - Shuts down snooping in the switch.</li><li><code>shutdown spanning-tree</code> - Shuts down spanning tree functionality in the switch.</li><li><code>spanning-tree mode</code> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li></ul>

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- **shutdown port-channel** - Shuts down LA in the switch and releases the allocated resources to the switch.
  - **shutdown lldp** - Shuts down all the ports in the LLDP and releases all the allocated memory.
  - **interface-configuration and deletion** - Allows to configure interface such as out of band management, port channel, tunnel, and so on.
  - **set vlan** - Globally enables / disables VLAN feature in the switch (that is the status of the VLAN feature is configured for all ports of the switch).
  - **vlan** - Creates a VLAN in the ISS and enters into the config-VLAN mode in which VLAN specific configurations are done.
  - **mac-vlan** - Enables MAC-based VLAN membership classification on all ports of the switch.
  - **subnet-vlan** - Enables subnet-VLAN based membership classification on all ports of the switch.
  - **protocol-vlan** - Enables protocol-VLAN based membership classification on all ports of the switch.
  - **map protocol** - Creates a protocol group with a specific protocol and encapsulation frame type combination.
  - **set gvrp** - Globally enables / disables GVRP feature on all ports of a switch.
  - **set gmrp** - Globally enables / disables GMRP feature on all ports of a switch.
  - **set vlan traffic-classes** - Enables or disables traffic class feature in a switch on all ports.
  - **switchport filtering-utility-criteria** - Creates filtering utility criteria for the port.
  - **mac-address-table static unicast - Transparent Bridging Mode** - Configures a static unicast MAC address in the forwarding database when base bridge mode is transparent bridging in order to control unicast packets to be processed.
  - **mac-address-table static multicast - Transparent Bridging mode** - Configures a static multicast MAC address in the forwarding database in transparent bridging mode in order to control multicast packets to be processed.
  - **wildcard** - Configures the wildcard VLAN entry for a specified MAC address or any MAC address.
  - **set unicast-mac learning** - Enables or disables unicast-MAC learning feature for a VLAN.
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- **vlan unicast-mac learning limit** - Configures the unicast-MAC learning limit for a VLAN.
  - **unicast-mac learning limit** - Configures the unicast-MAC learning limit for a switch.
  - **vlan active** - Activates a VLAN in the switch.
  - **switchport pvid** - Configures the PVID on the specified port.
  - **switchport acceptable-frame-type** - Configures the type of VLAN dependant BPDU frames such as GMRP BPDU, that the port should accept during the VLAN membership configuration.
  - **switchport ingress-filter** - Enables ingress filtering feature on the port.
  - **switchport map protocols-group** - Maps the protocol group configured to a particular VLAN identifier for the specified interface
  - **switchport priority default** - Sets the default user priority for the port
  - **switchport mode** - Configures the mode of operation for a switch port.
  - **switchport map protocols-group** - Maps the configured protocol group to a particular VLAN ID for an interface.
  - **switchport priority default** - Configures the default ingress user priority for a port.
  - **switchport protected** - Enables switchport protection feature for a port.
  - **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
  - **show vlan device info**: Displays the VLAN global information that is applicable to all VLANs created in the switch / all contexts.
-

## 19.5 mac-vlan

**Command Objective** This command enables MAC-based VLAN membership classification on all ports of the switch. VLAN membership classification is done based on the MAC address of the source of received packets. The VLAN membership should be assigned initially, if the MAC-based VLAN membership classification is to be enabled in the switch.

The no form of the command disables MAC-based VLAN membership classification on all ports of the switch.

**Syntax** `mac-vlan`  
`no mac-vlan`

**Mode** Global Configuration Mode

**Default** MAC-based VLAN membership classification is disabled on all ports of the switch.



MAC-based VLAN membership classification cannot be configured in the switch, if the base bridge mode is set as transparent bridging or the VLAN switching feature is shutdown in the switch.

**Example** `Your Product(config)# mac-vlan`


- Related Command(s)**
- `base bridge-mode dot1q-vlan` - Configures the VLAN operation mode as VLAN aware bridging.
  - `mac-map` - Configures the VLAN-MAC address mapping that is used only for MAC-based VLAN membership classification.
  - `no shutdown vlan` - Starts and enables VLAN switching feature in the switch.
  - `show vlan device info` - Displays the VLAN global information that is applicable to all VLANs created in the switch / all contexts.
  - `show mac-vlan` - Displays all entries in the MAC map table.



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## 19.6 subnet-vlan

<b>Command Objective</b>	<p>This command enables subnet-VLAN based membership classification on all ports of the switch. The source IP address in received packet is matched to a VLAN ID using an administrator configured table to perform VLAN membership classification.</p> <p>The no form of the command disables subnet-VLAN based membership classification on all ports of the switch.</p>
<b>Syntax</b>	<p><b>subnet-vlan</b></p> <p><b>no subnet-vlan</b></p>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	Subnet-based VLAN membership classification is disabled on all ports of the switch.
	Subnet-VLAN based membership classification cannot be configured in the switch, if the base bridge mode is set as transparent bridging or the VLAN switching feature is shutdown in the switch.
<b>Example</b>	<pre>Your Product(config)# subnet-vlan</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>base bridge-mode dot1q-vlan</b> - Configures the VLAN operation mode as VLAN aware bridging.</li><li>• <b>map subnet</b> - Configures VLAN-IP subnet address mapping that is used only for subnet-VLAN based membership classification.</li><li>• <b>no shutdown vlan</b> - Starts and enables VLAN switching feature in the switch.</li><li>• <b>show vlan device info</b> - Displays the VLAN global information that is applicable to all VLANs created in the switch / all contexts.</li><li>• <b>show subnet-vlan mapping</b> - Displays all entries in the subnet map table.</li></ul>

---

## 19.7 protocol-vlan

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<b>Command Objective</b>	<p>This command enables protocol-VLAN based membership classification on all ports of the switch. VLAN membership classification is done for all untagged and priority-tagged frames based on the port-protocol group / higher layer protocol for the port.</p> <p>The no form of the command disables protocol-VLAN based membership classification on all ports of the switch.</p>
<b>Syntax</b>	<p><code>protocol-vlan</code></p> <p><code>no protocol-vlan</code></p>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	Protocol-based VLAN membership classification is enabled on all ports of the switch.
	Protocol-VLAN based membership classification cannot be configured in the switch, if the base bridge mode is set as transparent bridging or the VLAN switching feature is shutdown in the switch.
<b>Example</b>	<pre>Your Product(config)# no protocol-vlan</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>base bridge-mode dot1q-vlan</code> - Configures the VLAN operation mode as VLAN aware bridging.</li><li>• <code>port protocol-vlan</code> - Enables protocol-VLAN based membership classification in a port.</li><li>• <code>no shutdown vlan</code> - Starts and enables VLAN switching feature in the switch.</li><li>• <code>show vlan device info</code> - Displays the VLAN global information that is applicable to all VLANs created in the switch / all contexts</li></ul>

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## 19.8 map protocol

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### Command Objective

This command creates a protocol group with a specific protocol and encapsulation frame type combination.

The created protocol group is used for protocol-VLAN based membership classification. The specified protocol is applied above the data-link layer in a protocol template, and the frame type is applied in the template.

The no form of the command deletes all group that have the specified protocol and encapsulation frame type combination.

---

### Syntax

```
map protocol {ip | novell | netbios | appletalk | other  
<aa:aa or aa:aa:aa:aa:aa>} {enet-v2 | snap | llcOther |  
snap8021H | snapOther} protocols-group <Group id integer(0-  
2147483647)>
```

```
no map protocol {ip | novell | netbios | appletalk | other  
<aa:aa or aa:aa:aa:aa:aa>} {enet-v2 | snap | llcOther |  
snap8021H | snapOther}
```

---

### Parameter Description

- **ip** - Sets the protocol as IP, which is used for communicating data across network using TCP / IP. The corresponding octet string is 08:00.
- **novell** - Sets the protocol as Novell Netware protocol suite, which is developed by Novell Inc. The corresponding octet string is ff:ff.
- **netbios** - Sets the protocol as NetBIOS over TCP/IP, which allows legacy application relying on NetBIOS API to be used on modern TCP/IP networks. The corresponding octet string is f0:f0. This protocol can be set only for the encapsulation frame type llcOther.
- **appletalk** - Sets the protocol as AppleTalk, which is a proprietary suite of protocols developed by Apple Inc. The corresponding octet string is 80:9b.
- **other** - Sets the protocol type using its corresponding octet string. This value is used to configure some other protocol type other than ip, novell, netbios and appletalk and also the listed protocol types. This value is set as:
  - 16-bit (2 octet) IEEE 802.3 type field, if the frame type is set as enet-v2, snap and snap8021H.
  - 40-bit (5 octet) PID, if the frame type is set as snapOther.
  - 2 octet IEEE 802.2 LSAP pair, if the frame type is set as llcOther. The first octet is used for DSAP and the second octet is used for SSAP.
- **enet-v2** - Applies the standard IEEE 802.3 frame format. This format contains:
  - Preamble – 7 byte value that allows the Ethernet card to synchronize with the beginning of a frame.

- SFD – 1 byte value that indicates the start of a frame.
  - Destination – 6 byte MAC address of the destination.
  - Source – 6 byte MAC address of the source or a broadcast.
  - Length – 2 byte value representing the number of bytes in the data fields.
  - Data – 46 to 1500 bytes higher layer information containing protocol information or user data.
  - FCS – 4 byte value representing the cyclic redundancy check used by source and destination to verify a successful transmission.
- **snap** - Applies the sub-network access protocol format. This format contains the same structure as LLC format except the following additional fields added before the data field:
    - OUI – 3 byte value representing organizational unique ID assigned to vendors for differentiating protocols from different manufacturers.
    - Type – 2-byte value representing protocol type that defines a specific protocol in the SNAP. This maintains compatibility with Ethernet v2.
  - **llcOther** - Applies the LLC format. This format contains the same structure as IEEE 802.3 frame except the following additional fields added before the data field:
    - DSAP – 1 byte value representing destination service access point to determine the protocol used for the upper layer.
    - SSAP – 1 byte value representing source service access point to determine the protocol used for the upper layer.
    - Control – 1 byte value that is used by certain protocols for administration.
  - **snap8021H** - Applies the sub-network access protocol format. This format contains the same structure as LLC format except for two additional fields before the data field as mentioned below:
    - 3 octet field having value 00:00:F8 signifying that next 2 octet field is the encoding of 802.3 Type field in an IEEE 802.2/SNAP Header.
    - 2 octet Type field - encoding of 802.3 Type field in an IEEE 802.2/SNAP Header
  - **snapOther** - Applies the sub-network access protocol format. This format contains the same structure as LLC format except for an additional 5 octet SNAP Protocol Identifier (PID) added before the data field. The value of the PID is not in either of the ranges used for RFC\_1042(SNAP) or SNAP 802.1H. This frame type can be set only for some other protocol type other than ip, novell, netbios and appletalk.
  - **<Group id integer(0-2147483647)>** - Configures a unique group ID that is to be created with the specified protocol type and encapsulation frame type. This value represents a specific group of protocols that are associated together when assigning a VID to a frame. This value ranges between 0 and 2147483647.

---

**Mode**

Global Configuration Mode

---

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---



Protocol group cannot be created and configured in the switch, if the base bridge mode is set as transparent bridging or the VLAN switching feature is shutdown in the switch.

---

## Example

```
Your Product(config)# map protocol ip enet-v2 protocols-group 1
```

---

## Related Command(s)

- `base bridge-mode dot1q-vlan` - Configures the VLAN operation mode as VLAN aware bridging.
  - `switchport map protocols-group` - Maps the configured protocol group to a particular VLAN ID for an interface.
  - `no shutdown vlan` - Starts and enables VLAN switching feature in the switch.
  - `show vlan protocols-group` - Displays all entries in the protocol group table.
-

## 19.9 set vlan traffic-classes

**Command Objective** This command enables or disables traffic class feature in a switch on all ports.

Traffic class feature is used to meet the latency and throughput requirement of time-critical traffic in a LAN environment, where both time-critical and non-time-critical traffic compete for the network bandwidth.

**Syntax** `set vlan traffic-classes {enable | disable}`

**Parameter Description**

- **enable** - Enables traffic class feature in the switch on all ports. You can assign user priority to the particular traffic class.
- **disable** - Disables traffic class feature in the switch on all ports. The switch operates with a single priority level for all traffics

**Mode** Global Configuration Mode

**Default** enable



The traffic class feature cannot be configured in the switch, if the base bridge mode is set as transparent bridging or the VLAN switching feature is shutdown in the switch.

**Example** `Your Product(config)# set vlan traffic-classes disable`

**Related Command(s)**

- **base bridge-mode dot1q-vlan** - Configures the VLAN operation mode as VLAN aware bridging.
- **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
- **show vlan device info** - Displays the VLAN global information that is applicable to all VLANs created in the switch / all contexts.

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## 19.10 mac-address-table static unicast

---

**Command Objective** This command configures a static unicast MAC address in the forwarding database.

The no form of the command deletes a configured static Unicast MAC address from the forwarding database.

---

**Syntax**


```
mac-address-table static unicast <aa:aa:aa:aa:aa:aa> vlan
<vlan-id/vfi_id> [{recv-port <ifXtype> <ifnum> }]
[interface ([<interface-type> <0/a-b, 0/c, ...>]
[<interface-type> <0/a-b, 0/c, ...>] [port-channel <a,b,c-
d>][pw <a,b,c-d>][ac <a,b, c-d>])] [connection-identifier
<ucast_mac>] [status { permanent | deleteOnReset |
deleteOnTimeout }]
```


```
no mac-address-table static unicast <aa:aa:aa:aa:aa:aa>
vlan <vlan-id/vfi_id> [{recv-port <ifXtype> <ifnum>}]
```


---

**Parameter Description**

- **<aa:aa:aa:aa:aa:aa>** - Configures the static unicast destination MAC address. The received packets having the specified MAC address are processed.
- **vlan <vlan-id/vfi-id>** - Configures the static unicast destination MAC address for the specified VLAN / VFI ID. This value ranges between 1 and 65535.
  - **<vlan -id>** - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094
  - **<vfi-id>** - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This feature is not supported.

 The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.

 VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW .

 The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.

---

- **recv-port** - Configures the receive ports details. The static unicast packets received only on this specified port are processed. The details to be provided are:
    - **<interface-type>** - Configures the receive ports details for the specified type of interface. The interface can be:
      - qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
      - gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
      - extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
      - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
    - **<interface-id>** - Configures the receive ports details for the specified type of interface. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel.
  - **interface** - Configures the member ports interface type and ID. The details to be provided are:
    - **<interface-type>** - Configures the member ports for the specified type of interface. The interface can be:
      - qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
      - gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
      - extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
      - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
    - **<0/a-b, 0/c, ...>** - Configures the member ports for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel.
  - **port-channel<a,b,c-d>** - Sets the list of port channel interfaces or a specific port channel identifier. Use comma as a separator without space while configuring list of interfaces. Example: 1,3.
-



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- **pw <a,b,c-d>** - Configures a static unicast MAC address for the specified pseudowire interface. When the pseudo wire interface is mapped to a specific VLAN, interface structures are created. This value ranges between 1 and 65535. Use comma as a separator without space while configuring list of interfaces. Example: 1,3.. This interface type is not supported.
- **ac <a,b, c-d>** - Configures a static unicast MAC address for the specified attachment circuit interface. This value ranges between 1 and 65535. Use comma as a separator without space while configuring list of interfaces. Example: 1,3. This interface type is not supported.
- **connection-identifier<ucast\_mac>** - Associates backbone MAC address of peer backbone edge bridge with customer MAC address that can be reached through the bridge.
- **status** - Specifies the status of the Static unicast entry. The options are:
  - **permanent** - Entry remains even after the next reset of the bridge
  - **deleteOnReset** - Entry remains until the next reset of the bridge
  - **deleteOnTimeout** - Entry remains until it is aged out

---

<b>Mode</b>	Global Configuration Mode
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---

<b>Default</b>	status - permanent
----------------	--------------------



- VLAN/Service-instance must have been configured and member ports must have been configured for the specified VLAN/Service-instance.
- The VLAN value in a configured static MAC entry must be active
- The new configured ports are appended to the existing member port list of the vlan
- The Egress port value and receive port value in a configured static MAC entry must be a member of the configured VLAN. Receive Port cannot be an Egress port in a configured static MAC entry

---

## Example

```
Your Product(config)# mac-address-table static unicast  
00:11:22:33:22:11 vlan 3 recv-port gigabitethernet 0/2  
interface gigabitethernet 0/1 status deleteOnTimeout
```

```
Your Product(config)# mac-address-table static unicast  
00:11:22:33:22:11 vlan 1 recv-port gigabitethernet 0/2  
interface gigabitethernet 0/1 pw 1
```

```
Your Product(config)# mac-address-table static unicast  
00:11:22:33:22:11 vlan 4099 recv-port gigabitethernet 0/2  
interface ac 1
```

---

## Related Command(s)

- **mac-address-table static multicast** - Configures a static multicast MAC address in the forwarding database.
- **vlan** - Configures a VLAN in the switch and enters the config-VLAN mode.

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- **ports** - Statically configures a VLAN entry with the required member ports, untagged ports and/or forbidden ports, and activates the VLAN.
  - **vlan active** - Activates a VLAN in the switch.
  - **show mac-address-table static unicast** - Displays the statically configured unicast address from the MAC address table.
-

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## 19.11 mac-address-table static unicast – Transparent Bridging Mode

---

### Command Objective

This command configures a static unicast MAC address in the forwarding database in transparent bridging mode in order to control unicast packets to be processed. Only the unicast packets having the configured value are processed.

The no form of the command deletes the configured static unicast address from the forwarding database.

---

### Syntax

```
mac-address-table static unicast <aa:aa:aa:aa:aa:aa> [recv-port <interface-type> <interface-id>] interface ([<interface-type> <0/a-b,0/c,...>] [<interface-type> <0/a-b,0/c,...>] [port-channel <a,b,c-d>]) [status { permanent | deleteOnReset | deleteOnTimeout }]
```

```
no mac-address-table static unicast <aa:aa:aa:aa:aa:aa> [recv-port <interface-type> <interface-id>]
```

---

### Parameter Description

- **<aa:aa:aa:aa:aa:aa>** - Configures the unicast destination MAC address. The received packets having the specified MAC address are processed.
- **recv-port** - Configures the receive port's details. The unicast packets received only on this specified port are processed. The details to be provided are:
  - **<interface-type>** - Sets the type of interface. The interface can be:
    - qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
    - gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
    - extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
    - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
  - **<interface-id>** - Sets the interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel.
- **interface** - Configures the member ports details. The unicast packets received on the specified receive ports and having the specified unicast destination MAC address are forwarded through these member ports. The

details to be provided are:

- **<interface-type>** - Sets the type of interface. The interface can be:
  - qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
  - gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
  - extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
  - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
- **<0/a-b, 0/c, ...>** - Sets the list of interfaces or a specific interface identifier. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel. Use comma as a separator without space while configuring list of interfaces. Example: 0/1,0/3 or 1,3.
- **port-channel<a,b,c-d>** - Sets the list of port channel interfaces or a specific port channel identifier. Use comma as a separator without space while configuring list of interfaces. Example: 1,3.
- **status** - Configures the status of the static unicast entry. The options are:
  - **permanent** - The static unicast entry resides in the switch, even after restarting the switch.
  - **deleteOnReset** - The static unicast entry is deleted, once the switch is restart.
  - **deleteOnTimeout** - The static unicast entry is deleted once the MAC address table aging timer expires.

<b>Mode</b>	Global Configuration Mode
<b>Default</b>	status - permanent



- This command is applicable only if the base bridge mode is set as transparent bridging.
- The interface gigabitethernet 0/1 cannot be set as member port or receive port in the static entry, as it is configured as a router port in transparent bridging mode.
- The same interface cannot be configured as both ingress port (receive port) and egress port (member port). The port can act only as ingress or as egress.
- If the receive port is configured in the created static unicast MAC address entry, then that entry can be deleted only if the receive port details are

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exactly mentioned in the no form of the command.

- Only one static unicast MAC address entry is allowed in the switch in transparent bridging mode. If any updates need to be done in the existing one, then it should be deleted and new entry should be created with new configurations.

---

## Example




```
Your Product(config)# mac-address-table static unicast  
00:11:22:33:44:55 recv-port gigabitethernet 0/3 interface  
gigabitethernet 0/2 status deleteOnTimeout
```

---

## Related Command(s)


- **base bridge-mode dot1d-bridge** - Configures the VLAN operation mode as transparent bridging.
  - **mac-address-table aging-time** - Configures the timeout period (in seconds) for aging out dynamically learned forwarding information entry and static entry in the MAC address table.
  - **show dot1d mac-address-table** - Displays all static / dynamic unicast and multicast MAC address entries created in the FDB table, when the VLAN base bridge mode is transparent bridging.
  - **show dot1d mac-address-table static unicast**- Displays all static unicast MAC address entries created in the FDB table, when the VLAN base bridge mode is transparent bridging.
-

## 19.12 mac-address-table static multicast


<b>Command Objective</b>	This command configures a static multicast MAC address in the forwarding database.
<b>Syntax</b>	<pre>mac-address-table static multicast &lt;aa:aa:aa:aa:aa:aa&gt; vlan &lt;vlan-id/vfi_id&gt; [recv-port &lt;ifXtype&gt; &lt;ifnum&gt;] interface ([&lt;interface-type&gt; &lt;0/a-b,0/c,...&gt;] [&lt;interface-type&gt; &lt;0/a- b,0/c,...&gt;] [port-channel &lt;a,b,c-d&gt;][pw &lt;a,b,c-d&gt;] [ac &lt;a,b,c-d&gt;]) [forbidden-ports ([&lt;interface-type&gt; &lt;0/a- b,0/c,...&gt;] [&lt;interface-type&gt; &lt;0/a-b,0/c,...&gt;] [port- channel &lt;a,b,c-d&gt;][pw &lt;a,b,c-d&gt;][ac &lt;a,b,c-d&gt;])] [status { permanent   deleteOnReset   deleteOnTimeout }]</pre> <pre>no mac-address-table static multicast &lt;aa:aa:aa:aa:aa:aa&gt; vlan &lt;vlan-id/vfi_id&gt; [recv-port &lt;ifXtype&gt; &lt;ifnum&gt;]}</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>&lt;aa:aa:aa:aa:aa:aa&gt;</b> - Configures the multicast destination MAC address. The received packets having the specified MAC address are processed.</li> <li>• <b>vlan &lt;vlan-id/vfi-id&gt;</b> - Configures the static multicast destination MAC address for the specified VLAN / VFI ID. This value ranges between 1 and 65535. <ul style="list-style-type: none"> <li>– <b>&lt;vlan -id&gt;</b> - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094</li> <li>– <b>&lt;vfi-id&gt;</b> - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This feature is not supported. <ul style="list-style-type: none"> <li> The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.</li> <li> VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW .</li> <li> The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.</li> </ul> </li> </ul> </li> <li>• <b>recv-port</b> - Configures the receive port's details. The multicast packets received only on this specified port are processed. The details to be provided are:</li> </ul>

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- **<ifXtype>** - Sets the type of interface. The interface can be:
    - qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
    - gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
    - extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
    - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
  - **<ifnum>** - Sets the interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface types port-channel.
  - **interface** - Configures the member ports details. The multicast packets received on the specified receive ports and having the specified multicast destination MAC address are forwarded through these member ports. The details to be provided are:
    - **<interface-type>** - Sets the type of interface. The interface can be:
      - qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
      - gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
      - extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
      - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
    - **<0/a-b, 0/c, ...>** - Sets the list of interfaces or a specific interface identifier. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel. Use comma as a separator without space while configuring list of interfaces. Example: 0/1,0/3 or 1,3.
    - **port-channel <a,b,c-d>** - Sets the list of port channel interfaces or a specific port channel identifier. Use comma as a separator without space while configuring list of interfaces. Example: 1,3.
    - **pw <a,b,c-d>** - Configures a static multicast MAC address the Pseudo wire interface. When the pseudo wire interface is mapped to a specific VLAN, the interface structures are created. This value ranges between 1 and 65535. This interface type is not supported.
-  Maximum number of PseudoWire interfaces supported in the system is 100.
- **ac <a,b, c-d>** - Configures a static multicast MAC address for the specified attachment circuit interface. This value ranges between 1 and
-

65535. Use comma as a separator without space while configuring list of interfaces. Example: 1,3. This interface type is not supported.

- **forbidden-ports** - Configures the ports for which GMRP should not dynamically register the service requirement attribute forward all multicast groups. This configuration is restored once the switch is reset. The details to be provided are:
  - **<interface-type>** - Sets the type of interface. The interface can be:
    - qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
    - gigabitethernet - A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
    - extreme-ethernet - A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
    - port-channel - Logical interface that represents an aggregator which contains several ports aggregated together.
  - **<0/a-b, 0/c, ...>** - Sets the list of interfaces or a specific interface identifier. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel. Use comma as a separator without space while configuring list of interfaces. Example: 0/1,0/3 or 1,3.
  - **port-channel <a,b,c-d>** - Sets the list of port channel interfaces or a specific port channel identifier. Use comma as a separator without space while configuring list of interfaces. Example: 1,3
  - **pw <a,b,c-d>** - Configures the Pseudo wire interface. When the pseudo wire interface is mapped to a specific VLAN, the interface structures are created. This value ranges between 1 and 65535. This interface type is not supported.
-  Maximum number of PseudoWire interfaces supported in the system is 100
- **ac <a,b, c-d>** - Configures a static multicast MAC address for the specified attachment circuit interface. This value ranges between 1 and 65535. Use comma as a separator without space while configuring list of interfaces. Example: 1,3. This interface is not supported.
- **status** - Status of the static multicast entry. The options are:
  - **permanent** - Entry remains even after the next reset of the bridge
  - **deleteOnReset** - Entry remains until the next reset of the bridge
  - **deleteOnTimeout** - Entry remains until it is aged out

**Mode** Global Configuration Mode

**Default** status - permanent



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- VLAN/Service-instance must have been configured and member ports must have been configured for the specified VLAN/Service-instance.
- The VLAN value in a configured static MAC entry must be active
- The new configured ports are appended to the existing member port list of the VLAN
- The Egress Port value and Receive Port value in a configured static MAC entry must be a member of the configured VLAN
- Receive Port cannot be an Egress port in a configured static MAC entry

---

## Example

```
Your Product(config)# mac-address-table static multicast  
01:02:03:04:05:06 vlan 2 interface gigabitethernet 0/1
```

---

## Related Command(s)

- **mac-address-table static unicast** - Configures a static unicast MAC address in the forwarding database.
  - **vlan** - Configures a VLAN in the switch and is also used to enter in to the config-VLAN mode.
  - **ports** - Statically configures a VLAN entry with the required member ports, untagged ports and/or forbidden ports, and activates the VLAN. The VLAN can also be activated using the **vlan active** command.
  - **vlan active** - Activates a VLAN in the switch.
  - **show mac-address-table static multicast** - Displays the statically configured multicast entries.
-

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## 19.13 mac address-table static mcast

**Command Objective** This command configures a static multicast MAC (Media Access Control) address in the forwarding database.

The no form of the command deletes a configured static multicast MAC address from the forwarding database.



This command is a complete standardized implementation of the existing command and operates similar to that of the command mac-address-table static multicast.

This feature has been included in adherence to the Industry Standard CLI syntax.

### Syntax

```
mac address-table static <mcast_mac> vlan <integer(1-4094)>
([interface <interface-type> <0/a-b,0/c,...>] [<interface-
type> <0/a-b,0/c,...>][port-channel <a,b,c-d>])
```

```
no mac address-table static <mcast_mac> vlan <vlan-id(1-
4094)> [interface <ifXtype> <ifnum>]
```

### Parameter Description

- **<mcast\_mac>** - Configures the static MAC address that should be mapped to the specified VLAN and used for MAC based VLAN membership classification.
- **vlan<integer(1-4094)>** - Configures the VLAN ID to which the configured MAC address should be mapped. This is a unique value that represents the specific VLAN created. This value ranges between 1 and 4094.
- **interface** - Configures the member ports details. The static packets received on the specified receive ports and having the specified static destination MAC address are forwarded through these member ports. The details to be provided are:
  - **<interface-type>** - Sets the type of interface. The interface can be:
    - qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
    - gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
    - extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
    - internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
    - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.

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- **<0/a-b, 0/c, ...>** - Sets the list of interfaces or a specific interface identifier. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel. Use comma as a separator without space while configuring list of interfaces. Example: 0/1,0/3 or 1,3.
  - **port-channel<a,b,c-d>** - Sets the list of port channel interfaces or a specific port channel identifier. Use comma as a separator without space while configuring list of interfaces. Example: 1,3.

**Mode** Global Configuration Mode



- VLAN must have been configured and member ports must have been configured for the specified VLAN.
- The VLAN value in a configured static MAC entry must be active

**Example**  
`Your Product(config)# mac address-table static  
01:02:03:04:05:06 vlan 2 interface gigabitethernet 0/1`

- Related Command(s)**
- **show mac-address-table static multicast** - Displays the statically configured multicast entries.
  - **vlan** - Configures a VLAN in the switch and is also used to enter in to the config-VLAN mode.
  - **vlan active** - Activates a VLAN in the switch.
  - **ports** - Configures a VLAN entry.

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## 19.14 mac-address-table static multicast – Transparent Bridging mode

**Command Objective** This command configures a static multicast MAC address in the forwarding database in transparent bridging mode in order to control multicast packets to be processed. Only the multicast packets having the configured value are processed.

This configuration is used to filter incoming reports that can be commonly used by all multicast protocols.

The no form of command deletes the configured static multicast MAC address from the forwarding database.

**Syntax**

```
mac-address-table static multicast <aa:aa:aa:aa:aa:aa>
[recv-port <interface-type> <interface-id>] interface
([<interface-type> <0/a-b,0/c,...>] [<interface-type> <0/a-
b,0/c,...>] [port-channel <a,b,c-d>])) [status { permanent
| deleteOnReset | deleteOnTimeout }]

no mac-address-table static multicast <aa:aa:aa:aa:aa:aa>
[recv-port <interface-type> <interface-id>]
```

**Parameter Description**

- **<aa:aa:aa:aa:aa:aa>** - Configures the multicast destination MAC address. The received packets having the specified MAC address are processed.
- **recv-port** - Configures the receive port's details. The multicast packets received only on this specified port are processed. The details to be provided are:
  - **<ifXtype>** - Sets the type of interface. The interface can be:
    - qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
    - gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
    - extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
    - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
  - **<ifnum>** - Sets the interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel.

- **interface** - Configures the member ports details. The multicast packets received on the specified receive ports and having the specified multicast destination MAC address are forwarded through these member ports. The details to be provided are:
  - **<interface-type>** - Sets the type of interface. The interface can be:
    - qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
    - gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
    - extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
    - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
  - **<0/a-b, 0/c, ...>** - Sets the list of interfaces or a specific interface identifier. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel. Use comma as a separator without space while configuring list of interfaces. Example: 0/1,0/3 or 1,3.
  - **port-channel <a,b,c-d>** - Sets the list of port channel interfaces or a specific port channel identifier. Use comma as a separator without space while configuring list of interfaces. Example: 1,3.
- **status** - Configures the status of the static multicast entry. The options are:
  - **permanent** - The static multicast entry resides in the switch, even after restarting the switch.
  - **deleteOnReset** - The static multicast entry is deleted, once the switch is restart.
  - **deleteOnTimeout** - The static multicast entry is deleted once the MAC address table aging timer expires.

<b>Mode</b>	Global Configuration Mode
<b>Default</b>	status - permanent



- This command is applicable only if the base bridge mode is set as transparent bridging.
- The interface gigabitethernet 0/1 cannot be set as member port or receive port in the static entry, as it is configured as a router port in transparent bridging mode.
- The same interface cannot be configured as both ingress port (receive port)

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and egress port (member port). The port can act only as ingress or as egress.

- If the receive port is configured in the created static multicast MAC address entry, then that entry can be deleted only if the receive port details are exactly mentioned in the no form of the command.
- Only one static multicast MAC address entry is allowed in the switch in transparent bridging mode. If any updates need to be done in the existing one, then it should be deleted and new entry should be created with new configurations.

---

## Example

```
Your Product(config)# mac-address-table static multicast  
01:00:5E:01:02:03interface gigabitethernet 0/2
```


---

## Related Command(s)

- **base bridge-mode dot1d-bridge** - Configures the VLAN operation mode as transparent bridging.
  - **mac-address-table aging-time** - Configures the timeout period (in seconds) for aging out dynamically learned forwarding information entry and static entry in the MAC address table.
  - **show dot1d mac-address-table** - Displays all static / dynamic unicast and multicast MAC address entries created in the FDB table, when the VLAN base bridge mode is transparent bridging.
  - **show dot1d mac-address-table static multicast** - Displays all static multicast MAC address entries created in the FDB table, when the VLAN base bridge mode is transparent bridging.
-





## 19.15 mac-address-table aging-time

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<b>Command Objective</b>	<p>This command configures the timeout period (in seconds) for aging out dynamically learned forwarding information entry and static entry in the MAC address table. That is, the entry is deleted once the aging timer expires. High value for the aging time helps to record dynamic entries for a longer time, if traffic is not frequent. This reduces the possibility of flooding.</p> <p>The no form of the command resets the maximum age of an entry in the MAC address table to its default value.</p>
<b>Syntax</b>	<pre>mac-address-table aging-time &lt;10-1000000 seconds&gt;</pre> <pre>no mac-address-table aging-time</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	300
	<ul style="list-style-type: none"><li>• The aging timer is applied to the static entry in the MAC address table, only if static entry status is set as deleteOnTimeout.</li><li>• The MAC address table maximum age can be configured in the switch, only if the VLAN switching feature is started and enabled in the switch.</li></ul>
<b>Example</b>	<pre>Your Product(config)# mac-address-table aging-time 200</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>mac-address-table static unicast - Transparent Bridging Mode</b> - Configures a static unicast MAC address in the forwarding database in transparent bridging mode in order to control unicast packets to be processed.</li><li>• <b>mac-address-table static multicast - Transparent Bridging mode</b> - Configures a static multicast MAC address in the forwarding database in transparent bridging mode in order to control multicast packets to be processed.</li><li>• <b>no shutdown vlan</b> - Starts and enables VLAN switching feature in the switch.</li><li>• <b>show mac-address-table aging-time</b> - Displays the ageing time configured for the MAC address table.</li></ul>

---

## 19.16 clear vlan statistics

<b>Command Objective</b>	<p>This command clears VLAN counters that maintain statistics information on a per VLAN basis.</p> <p>The counter is cleared for all available VLANs or for the specified VLAN. The statistics information contains number of unicast, broadcast and unknown unicast packets flooded.</p>
<b>Syntax</b>	<pre>clear vlan statistics [vlan &lt;vlan-id/vfi_id&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>vlan &lt;vlan-id/vfi-id&gt;</b> - Clears VLAN counters for the specified VLAN / VFI ID. This value ranges between 1 and 65535.<ul style="list-style-type: none"><li>– <b>&lt;vlan -id&gt;</b> - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094</li><li>– <b>&lt;vfi-id&gt;</b> - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This is not supported.</li></ul></li></ul> <p> The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.</p> <p> VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW.</p> <p> The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.</p>
<b>Mode</b>	Global Configuration Mode
	The information is the VLAN counters can be deleted, only if the VLAN switching feature is started and enabled in the switch.
<b>Example</b>	<pre>Your Product(config)# clear vlan statistics vlan 1</pre>
<b>Related Command (s)</b>	<ul style="list-style-type: none"><li>• <b>no shutdown vlan</b> - Starts and enables VLAN switching feature in the switch.</li><li>• <b>show vlan statistics</b> - Displays the unicast / broadcast statistics details of all active VLANs and VLANs (that are not active) for which the port details are configured.</li></ul>



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## 19.17 wildcard

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**Command Objective** This command configures the wildcard VLAN entry for a specified MAC address or any MAC address.

The wild card VLAN static filtering information is used for all VLANs for which no static unicast and multicast MAC address entries are created.

The no form of the command deletes the wildcard entry for the specified MAC address or broadcast address.

---

**Syntax**

```
wildcard {mac-address <mac_addr> | broadcast} interface ([<interface-type> <0/a-b, 0/c, ...>] [<interface-type> <0/a-b, 0/c, ...>] [port-channel <a,b,c-d>][pw <a,b,c-d>] [ac <a,b,c-d>])
```

```
no wildcard {mac-address <mac_addr> | broadcast}
```


---

**Parameter Description**

- **mac-address<mac\_addr>** - Configures the destination unicast or multicast MAC address to which filtering information of wild card entry should be applied. The received frames that contain the configured MAC address are forwarded through the specified interface, if no specific static filtering is configured for that MAC address.
- **broadcast** - Configures automatically the destination MAC address as ff:ff:ff:ff:ff:ff. The received frames that contain any MAC address are forwarded through the specified interface, if no specific filtering is configured for that MAC address.
- **interface** - Configures the member ports details. The received frames having the specified destination MAC address are forwarded through these member ports. The details to be provided are:
  - **<interface-type>** - Sets the type of interface. The interface can be:
    - qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
    - gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
    - extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
    - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
  - **<0/a-b, 0/c, ...>** - Sets the list of interfaces or a specific interface identifier. This value is a combination of slot number and port number separated by a slash, for interface type other than

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port-channel. Only port-channel ID is provided, for interface type port-channel. Use comma as a separator without space while configuring list of interfaces. Example: 0/1,0/3 or 1,3.

- **port-channel <a,b,c-d>** - Sets the list of port channel interfaces or a specific port channel identifier. Use comma as a separator without space while configuring list of interfaces. Example: 1,3.
- **pw <a,b,c-d>** - Sets Pseudo wire interface. When the pseudo wire interface is mapped to a specific VLAN, the interface structures are created. This value ranges between 1 and 65535. This interface type is not supported.  
 Maximum number of PseudoWire interfaces supported in the system is 100.
- **ac <a,b, c-d>** - Configures the wildcard entry for the specified ac identifier or a list of identifiers. This value ranges between 1 and 65535. Use comma as a separator without space while configuring list of interfaces. Example: 1,3. This interface type is not supported.

## Mode

Global Configuration Mode



- The wildcard VLAN entry cannot be configured in the switch, if the base bridge mode is set as transparent bridging or the VLAN switching feature is shutdown in the switch.
- This command executes only if statically a VLAN entry is configured with the required member ports

## Example

```
Your Product(config)# wildcard mac-address  
01:02:03:04:05:06 interface gigabitethernet 0/1
```

## Related Command(s)

- **base bridge-mode dot1q-vlan** - Configures the VLAN operation mode as VLAN aware bridging.
- **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
- **show wildcard** - Displays all wildcard MAC entries created in the switch / in all contexts.
- **ports** - Statically configures a VLAN entry with the required member ports, untagged ports and/or forbidden ports, and activates the VLAN. The VLAN can also be activated using the vlan active command.

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## 19.18 unicast-mac learning limit

**Command Objective** This command configures the unicast-MAC learning limit for a switch. The limit represents the maximum number of distinct unicast MAC addresses that can be learnt in the switch. This value ranges between 0 and 4294967295.

The maximum number of unicast MAC addresses learnt differs for SMIS models. Some models may not support because of hardware limitation.

The no form of the command resets the unicast-MAC learning limit for the switch to its default value.

**Syntax** `unicast-mac learning limit <limit value(0-4294967295)>`  
`no unicast-mac learning limit`

**Mode** Global Configuration mode

**Default** The maximum limit supported by the switch.



- The limiting value should not be less than the unicast MAC learning limit set for any of the VLAN.
- Unicast-MAC learning limit cannot be configured in the switch, if the base bridge mode is set as transparent bridging or the VLAN switching feature is shutdown in the switch.

**Example** `Your Product(config)# unicast-mac learning limit 5`

**Related Command(s)**

- `base bridge-mode dot1q-vlan` - Configures the VLAN operation mode as VLAN aware bridging.
- `vlan unicast-mac learning limit` - Configures the unicast-MAC learning limit for a VLAN.
- `no shutdown vlan` - Starts and enables VLAN switching feature in the switch.
- `show vlan device info` - Displays the VLAN global information applicable to all VLANs created in the switch / all contexts.

## 19.19 map subnet

**Command Objective** This command configures VLAN-IP subnet address mapping that is used only for subnet-VLAN based membership classification.




In subnet-VLAN based membership classification, the source IP address in received packet is matched to a VLAN ID using this mapping entry to perform VLAN membership classification.

The no form of the command deletes the VLAN-IP subnet address mapping entry.

**Syntax** `map subnet <ip-subnet-address> vlan <vlan-id/vfi_id> [arp {suppress | allow}][mask <subnet-mask>]`

`no map subnet <ip-subnet-address> [mask <subnet-mask>]`

**Parameter Description**

- **<ip-subnet-address>** - Configures the IP subnet address to be used for deciding on discarding / allowing of ARP frames.
- **vlan <vlan-id/vfi-id>** - Configures VLAN-IP subnet address mapping for the specified VLAN / VFI ID. This value ranges between 1 and 65535.
  - **<vlan -id>** - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094
  - **<vfi-id>** - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported.
    -  The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.
    -  VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW .
    -  The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.
- **arp** - Configures the way of handling of ARP untagged frames on the specified VLAN. The options are:
  - **suppress** - Does not perform VLAN classification for ARP frames having the specified source IP subnet address.
  - **allow** - Performs VLAN classification for ARP frames having the

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specified source IP subnet address.



This parameter is not supported in some SMIS models. The ARP option cannot be configured as allow, when the hardware does not classify ARP broadcast packets based on subnet VLAN mapping. In such case, subnet VLAN mapping works only on IP packets.

- **mask <subnet-mask>** - Configures the subnet mask address to be used for deciding on discarding / allowing of ARP frames.

---

**Mode**

Global Configuration Mode

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**Default**

arp - Suppress for all boards



- Only the VLANs that are activated in the switch can be mapped to the specified IP subnet address.
- VLAN-IP subnet address mapping can be configured in the port, only if the VLAN switching feature is started and enabled in the switch.

---

**Example**

```
Your Product(config-if)# map subnet 14.0.0.0 vlan 1 arp allow
```

---

**Related Command(s)**

- **subnet-vlan** - Enables subnet-VLAN based membership classification on all ports of the switch.
  - **vlan active** - Activates a VLAN in the switch.
  - **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
  - **show subnet-vlan mapping** - Displays all entries in the subnet map table.
-

## 19.20 ports

**Command Objective** This command statically configures a VLAN entry with the required member ports, untagged ports and/or forbidden ports, and activates the VLAN. The VLAN can also be activated using the `vlan active` command.

The configuration defines the tagged and untagged member ports that are used for egress tagging of a VLAN at a port.

The no form of the command deletes the specified port details for the VLAN. The member ports cannot be set empty for the VLAN, once the member ports details are configured for that VLAN.

**Syntax**


```
ports [add] ([<interface-type> <0/a-b,0/c,...>]
[<interface-type> <0/a-b,0/c,...>] [port-channel <a,b,c-d>]
[pw <a,b,c-d>][pw <a,b,c-d>]) [untagged <interface-type>
<0/a-b,0/c,...> [<interface-type> <0/a-b,0/c,...>] [port-
channel <a,b,c-d>] [pw <a,b,c-d>] [ac <a,b,c-d>] [all]])
[forbidden <interface-type> <0/a-b,0/c,...> [<interface-
type> <0/a-b,0/c,...>] [port-channel <a,b,c-d>] [pw <a,b,c-
d>] [ac <a,b,c-d>]] [name <vlan-name>]
```

```
no ports [<interface-type> <0/a-b,0/c,...>] [<interface-
type> <0/a-b,0/c,...>] [port-channel <a,b,c-d>] [pw <a,b,c-
d>] [ac <a,b,c-d>] [all] [untagged ([<interface-type> <0/a-
b,0/c,...>] [<interface-type> <0/a-b,0/c,...>] [port-
channel <a,b,c-d>] [pw <a,b,c-d>] [ac <a,b,c-d>] [all]])]
[forbidden ([<interface-type> <0/a-b,0/c,...>] [<interface-
type> <0/a-b,0/c,...>] [port-channel <a,b,c-d>] [pw <a,b,c-
d>] [ac <a,b,c-d>] [all]])] [name <vlan-name>]
```


- Parameter Description**
- **add** - Appends the new configured ports to the existing member port list of the vlan
  - **<interface-type> <0/a-b,0/c,...>** - Configures the ports that should be set as a member of the VLAN. The details to be provided are:
    - **<interface-type>** - Sets the type of interface. The interface can be:
      - **qx-ethernet** – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
      - **gigabitethernet** – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
      - **extreme-ethernet** – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
      - **port-channel** – Logical interface that represents an aggregator which contains several ports aggregated together.

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- **<0/a-b, 0/c, ...>** - Sets the list of interfaces or a specific interface identifier. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel. Use comma as a separator without space while configuring list of interfaces. Example: 0/1,0/3 or 1,3.
- **port-channel<a,b,c-d>** - Sets the list of port channel interfaces or a specific port channel identifier. Use comma as a separator without space while configuring list of interfaces. Example: 1,3.
- **pw <a,b,c-d>** - Configures the Pseudo wire interface as member port. When the pseudo wire interface is mapped to a specific VLAN, the interface structures are created. This value ranges between 1 and 65535. This interface type is not supported.
  -  Maximum number of PseudoWire interfaces supported in the system is 100.
- **ac <a,b, c-d>** - Configures the specified attachment circuit interface as a member port. This value ranges between 1 and 65535. Use comma as a separator without space while configuring list of interfaces. Example: 1,3. This interface type is not supported.
- **all** - Deletes all configured member ports for the VLAN and sets the member ports as none. This option is available only in the no form of the command.
- **untagged<interface-type> <0/a-b,0/c,...>** - Configures the ports that should be used for the VLAN to transmit egress packets as untagged packets. The details to be provided are:
  - **<interface-type>** - Sets the type of interface. The interface can be:
    - qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
    - gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
    - extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
    - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
  - **<0/a-b, 0/c, ...>** - Sets the list of interfaces or a specific interface identifier. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel. Use comma as a separator without space while configuring list of interfaces. Example: 0/1,0/3 or 1,3.
  - **port-channel** - Sets the list of port channel interfaces or a specific port channel identifier. Use comma as a separator without space while configuring list of interfaces. Example: 1,3.

- **pw <a,b,c-d>** - Sets Pseudo wire interface. When the pseudo wire interface is mapped to a specific VLAN, the interface structures are created. This value ranges between 1 and 65535. This interface type is not supported.

 Maximum number of PseudoWire interfaces supported in the system is 100.


- **ac <a,b, c-d>** - Configures the ac identifier or a list of identifiers to be used for the VLAN to transmit egress packets as untagged packets. This value ranges between 1 and 65535. Use comma as a separator without space while configuring list of interfaces. Example: 1,3. This interface type is not supported.
- **all** - Sets all configured member ports as the untagged ports for the VLAN.

The ports configured should be a subset of the member ports.

The ports that are attached to VLAN-aware devices should always be set as untagged ports only.

The ports can be set as untagged ports, only if they are not configured as trunk ports.

- **forbidden<interface-type> <0/a-b,0/c,...>** - Configures the ports that should never receive packets from the VLAN. These ports drops the packets received from this VLAN. The details to be provided are:
  - **<interface-type>** - Sets the type of interface. The interface can be:
    - **qx-ethernet** – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
    - **gigabitethernet** – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
    - **extreme-ethernet** – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
    - **port-channel** – Logical interface that represents an aggregator which contains several ports aggregated together.
  - **<0/a-b, 0/c, ...>** - Sets the list of interfaces or a specific interface identifier. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel. Use comma as a separator without space while configuring list of interfaces. Example: 0/1,0/3 or 1,3.
  - **port-channel** - Sets the list of port channel interfaces or a specific port channel identifier. Use comma as a separator without space while configuring list of interfaces. Example: 1,3.
  - **pw <a,b,c-d>** - Sets the Pseudo wire interface as a port that should never receive packets from the VLAN. When the pseudo wire interface is mapped to a specific VLAN, the interface structures are created. This value ranges between 1 and 65535. This interface type is not supported

 Maximum number of PseudoWire interfaces supported in the system is 100.



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- **ac <a,b, c-d>** - Sets the AC interface as a port that should never receive packets from the VLAN. This value ranges between 1 and 65535. Use comma as a separator without space while configuring list of interfaces. Example: 1,3. This interface type is not supported.
- **all** - Deletes all configured forbidden ports for the VLAN and sets the forbidden port as none. This option is available only in the no form of the command.

The ports configured should not be a subset of the member ports. That is, the forbidden ports and member ports are mutually exclusive.

- **name<vlan-name>** - Configures the unique name of the VLAN. This name is used to identify the VLAN and is an administratively assigned string with the maximum size as 32.

---


<b>Mode</b>	Config-VLAN Mode
<b>Default</b>	All ports available in the switch are configured as member ports and untagged ports of the default VLAN (VLAN 1). For other active VLANs, the member, untagged and forbidden ports are not set (that is, set as none).
<b>Example</b>	<pre>Your Product(config-vlan)# ports gigabitethernet 0/1 pw 1 untagged gigabitethernet 0/1 forbidden gigabitethernet 0/2 pw 2 name v11  Your Product(config-vlan)# ports add gigabitethernet 0/1 ac 1 untagged gigabitethernet 0/1 forbidden gigabitethernet 0/2 ac 2 name v11</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>vlan active</b> - Activates a VLAN in the switch.</li><li>• <b>ports</b> - Statically configures a VLAN entry with the required member ports, untagged ports and/or forbidden ports, and activates the VLAN. The VLAN can also be activated using the <code>vlan active</code> command.</li><li>• <b>switchport mode</b> - Configures the mode of operation for a switch port.</li><li>• <b>show vlan</b> - Displays VLAN entry related information of all active VLANs and VLANs (that are not active) for which the port details are configured.</li><li>• <b>show vlan statistics</b> - Displays the unicast / broadcast statistics details of all active VLANs and VLANs (that are not active) for which the port details are configured.</li><li>• <b>show mac-address-table count</b> - Displays the total number of static / dynamic unicast and multicast MAC address entries created in the FDB table.</li><li>• <b>show vlan learning params</b> - Displays the VLAN learning parameter details for all active VLANs and VLANs (that are not active) for which the port details are configured, available in all contexts / in the switch.</li><li>• <b>set vlan counter</b> - Enables or disables the statistics collection for the specified VLAN.</li></ul>

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## 19.21 vlan active


<b>Command Objective</b>	This command activates a VLAN in the switch. The created VLANs should be active for further VLAN related configurations. The VLAN can also be activated using ports command.
<b>Syntax</b>	<code>vlan active</code>
<b>Mode</b>	Config-VLAN Mode
<b>Default</b>	Only default VLAN (VLAN 1) is activated once the switch is started.
	VLAN cannot be made active, if base bridge mode is set as transparent bridging.
<b>Example</b>	<code>Your Product(config-vlan)# vlan active</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ports</code> - Statically configures a VLAN entry with the required member ports, untagged ports and/or forbidden ports, and activates the VLAN.</li><li>• <code>base bridge-mode dot1q-vlan</code> - Configures the VLAN operation mode as VLAN aware bridging.</li><li>• <code>mac-map</code> - Configures the VLAN-MAC address mapping that is used only for MAC-based VLAN membership classification.</li><li>• <code>map subnet</code> - Configures VLAN-IP subnet address mapping that is used only for subnet-VLAN based membership classification.</li><li>• <code>set unicast-mac learning</code> - Enables/ disables unicast-MAC learning feature for a VLAN.</li><li>• <code>vlan unicast-mac learning limit</code> - Configures the unicast-MAC learning limit for a VLAN.</li><li>• <code>switchport pvid</code> - Configures the PVID on the specified port.</li><li>• <code>show vlan</code> - Displays VLAN entry related information of all VLANs for which the port details are configured.</li><li>• <code>show vlan statistics</code> - Displays the unicast / broadcast statistics details of all VLANs for which the port details are configured.</li><li>• <code>show mac-address-table count</code> - Displays the total number of static / dynamic unicast and multicast MAC address entries created in the FDB table.</li></ul>

---

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- **show vlan learning params** - Displays the VLAN learning parameter details for all VLANs for which the port details are configured, available in all contexts / in the switch.
  - **set vlan counter** - Enables or disables the statistics collection for the specified VLAN.
-

## 19.22 set unicast-mac learning

<b>Command Objective</b>	<p>This command enables or disables unicast-MAC learning feature for a VLAN.</p> <p>The source MAC learning is not done in the switch when this feature is disabled for the VLAN.</p>
<b>Syntax</b>	<code>set unicast-mac learning { enable   disable   default }</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>enable</b> - Enables unicast-MAC learning feature for a VLAN.</li> <li>• <b>disable</b> - Disables unicast-MAC learning feature for a VLAN.</li> <li>• <b>default</b> - Sets the unicast-MAC learning feature of the VLAN to its default state.</li> </ul>
<b>Mode</b>	Config-VLAN Mode
<b>Default</b>	disable
	<ul style="list-style-type: none"> <li>• VLAN unicast-MAC learning feature cannot be configured in the VLAN, if the base bridge mode is set as transparent bridging.</li> <li>• VLAN unicast-MAC learning feature can be configured only in the VLANs that are activated.</li> </ul>
<b>Example</b>	<code>Your Product(config-vlan)# set unicast-mac learning disable</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li>• <code>base bridge-mode dot1q-vlan</code> - Configures the VLAN operation mode as VLAN aware bridging.</li> <li>• <code>vlan active</code> - Activates a VLAN in the switch.</li> <li>• <code>show vlan learning params</code> - Displays the VLAN learning parameter details for all active VLANs and VLANs (that are not active) for which the port details are configured, available in all contexts / in the switch.</li> </ul>

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## 19.23 interface range

---

**Command Objective** This command selects the range of physical interfaces and VLAN interfaces to be configured.

The no form of the command selects the range of VLAN interfaces to be removed.



This command is a complete standardized implementation of the existing command.

This feature has been included in adherence to the Industry Standard CLI syntax.

---

**Syntax**

```
interface range ( { <interface-type> <slot/port-port> }  
{vlan <vlan-id(1-4094)> - <vlan-id(2-4094)>})
```

```
no interface range vlan <vlan-id(1-4094)> - <vlan-id(2-4094)>
```

---

**Parameter Description**

- **<interface-type>** - Selects the range of the specified interface. The interface can be:
  - qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links
  - gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
  - extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
  - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
- **<slot/port-port>** - Selects the range of the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel.
- **vlan <vlan-id(1-4094)> - <vlan-id(2-4094)>** - Selects the range of the specified VLAN ID. This is a unique value that represents the specific VLAN created and activated. This value ranges between 1 and 4094.  
For specifying the interface VLAN range, space should be provided before and after the dash. That is, the command interface range vlan 1 – 4 is valid, whereas the command interface range vlan 1– 4 is not valid.

---

**Mode**

Global Configuration Mode

---

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For port channel range, the specified range must be configured using the interface command.

---

## Example

```
Your Product(config)# interface range gigabitethernet 0/1  
vlan 1 - 2
```

```
Your Product(config-if-range)#
```

```
Your Product(config)# interface range vlan 1 - 4  
gigabitethernet 0/1
```

```
Your Product(config-if-range)#
```

---

## Related Command(s)

- `interface` – Enters into the interface mode.
  - `show interfaces description` - Displays the interface status and configuration.
-

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---

## 19.24 vlan unicast-mac learning limit

**Command Objective** This command configures the unicast-MAC learning limit for a VLAN.

The limit represents the maximum number of distinct unicast MAC addresses that can be learnt in the VLAN. This value ranges between 0 and 4294967295. The maximum number of unicast MAC addresses that can be learnt differs for SMIS models. This feature may not be supported because of hardware limits.

The maximum limit that can be configured for a VLAN is dependent on the total size available for dynamic unicast entries in the forwarding table and on the maximum number of VLANs that can be supported. The lower and upper limit values depend on the underlying hardware.

The no form of the command resets the unicast-MAC learning limit for the VLAN to its default value.

**Syntax** `vlan unicast-mac learning limit <size(0-4294967295)>`  
`no vlan unicast-mac learning limit`

**Mode** Config-VLAN Mode

**Default** This value depends on the unicast entries size and maximum number of VLANs supported.



- VLAN unicast MAC learning limit configuration is allowed only in case of independent VLAN learning mode.
- VLAN unicast-MAC learning limit cannot be configured for the VLAN, if the base bridge mode is set as transparent bridging.
- The unicast-MAC learning limit set for the VLAN should not exceed the unicast MAC learning limit configured for the switch.
- VLAN unicast-MAC learning limit can be configured only in the VLANs that are activated.

**Example** `Your Product(config-switch-vlan)# vlan unicast-mac learning limit 100`

**Related Command (s)**

- `base bridge-mode dot1q-vlan` - Configures the VLAN operation mode as VLAN aware bridging.
- `unicast-mac learning limit` - Configures the unicast-MAC learning limit for a switch.
- `vlan active` - Activates a VLAN in the switch.

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- **show vlan learning params** - Displays the VLAN learning parameter details for all active VLANs and VLANs (that are not active) for which the port details are configured, available in all contexts / in the switch.
-






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---

## 19.25 switchport pvid

**Command Objective** This command configures the PVID on the specified port. The PVID represents the VLAN ID that is to be assigned to untagged frames or priority-tagged frames received on the port. The PVID is used for port based VLAN type membership classification. This value ranges between 1 and 65535.

- **<vlan -id>** - This is a unique value that represents the specific VLAN. This value ranges between 1 and 4094
- **<vfi-id>** - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This is not supported.
  -  The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.
  -  VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW.
  -  The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.

The PVID configuration done is used based on the acceptable frame type of the port. The packets are processed against PVID, if the packets accepted at ingress is not having a tag.

The no form of the command resets the PVID to the default value on the port.

---

**Syntax** `switchport pvid <vlan-id/vfi_id>`

`no switchport pvid`

---

**Mode** Interface Configuration mode (Physical / Port Channel)

---

**Default** 1 (ID of default VLAN)



- Only the IDs of the active VLAN can be used as PVIDs in the command.
- This command is applicable only for the port configured as switch port.
- The PVID cannot be configured for the port, if the base bridge mode is set

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as transparent bridging or the VLAN switching feature is shutdown in the switch.

---

**Example**

Your Product(config-if)# **switchport pvid 3**

---

**Related Command (s)**

- **switchport** - Configures the port as switch port.
  - **base bridge-mode dot1q-vlan** - Configures the VLAN operation mode as VLAN aware bridging.
  - **vlan active** - Activates a VLAN in the switch.
  - **switchport acceptable-frame-type** - Configures the type of VLAN dependant BPDU frames such as GMRP BPDU, that the port should accept during the VLAN membership configuration.
  - **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
  - **show vlan port config** - Displays the VLAN related port specific information for all interfaces available in the switch / all contexts.
-

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## 19.26 switchport access vlan

---

**Command Objective** This command configures the PVID (Port VLAN Identifier) on a port. This value ranges between 1 and 4094.

The no form of this command sets the PVID to the default value on the port.



This command is a complete standardized implementation of the existing command and operates similar to that of the command `switchport pvid`.

This feature has been included in adherence to the Industry Standard CLI syntax.

---

**Syntax** `switchport access vlan <vlanid (1-4094)>`

`no switchport access vlan`

---

**Mode** Interface Configuration Mode(Physical / Port Channel)




- If the frame (untagged/priority tagged/customer VLAN tagged) is received on a "tunnel" port, then the default PVID associated with the port is used.
- If the received frame cannot be classified as MAC-based or port-and-protocol-based, then the PVID associated with the port is used.
- Usage is based on acceptable frame type of the port. Packets will be either dropped or accepted at ingress. Once a packet is accepted, if the packet is having a tag, it will be processed against that tag. Otherwise, the packet will be processed against PVID.

---

**Example** `Your Product(config-if)# switchport access vlan 3`

- 
- Related Command(s)**
- `show vlan port config` - Displays the VLAN related parameters specific for ports
  - `switchport pvid` - Configures the PVID on the specified port
-

## 19.27 switchport acceptable-frame-type

<b>Command Objective</b>	<p>This command configures the type of VLAN dependent BPDU frames such as GMRP BPDU that the port should accept during the VLAN membership configuration.</p> <p>The no form of the command resets the acceptable frame type for the port to its default value.</p> <p>This configuration does not affect VLAN independent BPDU frames such as GVRP BPDU and STP BPDU. It affects only the VLAN dependent BPDU frames.</p>
<b>Syntax</b>	<pre>switchport acceptable-frame-type {all   tagged   untaggedAndPrioritytagged }  no switchport acceptable-frame-type</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>all</b> - Configures the acceptable frame type as all. All tagged, untagged and priority tagged frames received on the port are accepted and subjected to ingress filtering.</li><li>• <b>tagged</b> - Configures the acceptable frame type as tagged. Only the tagged frames received on the port are accepted and subjected to ingress filtering. The untagged and priority tagged frames received on the port are rejected.</li><li>• <b>untaggedAndPrioritytagged</b> - Configures the acceptable frame type as untagged and priority tagged. Only the untagged or priority tagged frames received on the port are accepted and subjected to ingress filtering. The tagged frames received on the port are rejected.</li></ul>
<b>Mode</b>	Interface Configuration Mode(Physical / Port Channel)
<b>Default</b>	all
	<ul style="list-style-type: none"><li>• This command is applicable only for the port configured as switch port.</li><li>• The acceptable frame type cannot be configured for the port, if the base bridge mode is set as transparent bridging or the VLAN switching feature is shutdown in the switch.</li><li>• The acceptable frame type cannot be configured and is always set as untaggedAndPrioritytagged, if the bridge port type is set as customer network port. The bridge port type can be set as CNP only in Metro package.</li></ul>

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<b>Example</b>	<code>Your Product(config-if)# switchport acceptable-frame-type tagged</code>
----------------	---

---

- |                           |   |
|---------------------------|---|
| <b>Related Command(s)</b> | <ul style="list-style-type: none"><li>• <code>switchport</code> - Configures the port as switch port.</li><li>• <code>bridge port-type</code> - Configures the bridge port type for an interface.</li><li>• <code>base bridge-mode dot1q-vlan</code> - Configures the VLAN operation mode as VLAN aware bridging.</li><li>• <code>switchport pvid</code> - Configures the PVID on the specified port.</li><li>• <code>switchport ingress-filter</code> - Enables ingress filtering feature on the port.</li><li>• <code>switchport mode</code> - Configures the mode of operation for a switch port.</li><li>• <code>no shutdown vlan</code> - Starts and enables VLAN switching feature in the switch.</li><li>• <code>show vlan port config</code> - Displays the VLAN related port specific information for all interfaces available in the switch / all contexts.</li></ul> |
|---------------------------|---|
-


## 19.28 switchport ingress-filter

<b>Command Objective</b>	<p>This command enables ingress filtering feature on the port.</p> <p>The ingress filtering is applied for the incoming frames received on the port. Only the incoming frames of the VLANs that have this port in its member list are accepted. This configuration does not affect VLAN independent BPDU frames such as GVRP BPDU and STP BPDU. It affects only the VLAN dependent BPDU frames GMRP BPDU.</p> <p>The no form of the command disables ingress filtering feature on the port. All incoming frames received on the port are accepted.</p>
<b>Syntax</b>	<pre>switchport ingress-filter</pre> <pre>no switchport ingress-filter</pre>
<b>Mode</b>	Interface Configuration Mode(Physical / Port Channel)
<b>Default</b>	The ingress filtering feature is disabled on the port.
	<ul style="list-style-type: none"> <li>This command is applicable only for the port configured as switch port.</li> <li>The ingress filtering cannot be configured on the port, if the base bridge mode is set as transparent bridging or the VLAN switching feature is shutdown in the switch.</li> <li>The ingress-filtering feature cannot be configured and is always enabled on the port, if the bridge port type is set as customer network port – S tagged. The bridge port type can be set as CNP-S tagged only in Metro package.</li> </ul>
<b>Example</b>	<code>Your Product(config-if)# switchport ingress-filter</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><code>switchport</code> - Configures the port as switch port.</li> <li><code>bridge port-type</code> - Configures the bridge port type for an interface.</li> <li><code>base bridge-mode dot1q-vlan</code> - Configures the VLAN operation mode as VLAN aware bridging.</li> <li><code>switchport acceptable-frame-type</code> - Configures the type of VLAN dependant BPDU frames such as GMRP BPDU, that the port should accept during the VLAN membership configuration.</li> <li><code>no shutdown vlan</code> - Starts and enables VLAN switching feature in the switch.</li> <li><code>show vlan port config</code> - Displays the VLAN related port specific information for all interfaces available in the switch / all contexts.</li> </ul>

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## 19.29 port protocol-vlan

<b>Command Objective</b>	<p>This command enables protocol-VLAN based membership classification in a port. VLAN membership classification is done for all untagged and priority-tagged frames based on the port-protocol group / higher layer protocol for the port.</p> <p>The no form of the command disables protocol-VLAN based membership classification in the port.</p>
<b>Syntax</b>	<pre>port protocol-vlan</pre> <pre>no port protocol-vlan</pre>
<b>Mode</b>	Interface Configuration Mode(Physical / Port Channel)
<b>Default</b>	Protocol-VLAN based membership classification is enabled on all ports.
	<ul style="list-style-type: none"><li>• Protocol-VLAN based membership classification can be enabled or disabled in the ports without depending on the global status of the protocol-VLAN based membership classification.</li><li>• The change in global protocol-VLAN based membership classification overrides the port membership classification. For example, If the classification in the port is set as enabled while global classification is disabled, and if global classification is changed as enabled and once again to disabled, the classification in the port will be automatically set as disabled.</li><li>• Protocol-VLAN based membership classification can be enabled / disabled in the switch, only if the VLAN switching feature is started and enabled in the switch.</li></ul>
<b>Example</b>	<pre>Your Product(config-if)# no port protocol-vlan</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>protocol-vlan</code> - Enables protocol-VLAN based membership classification on all ports of the switch.</li><li>• <code>no shutdown vlan</code> - Starts and enables VLAN switching feature in the switch.</li><li>• <code>show vlan port config</code> - Displays the VLAN related port specific information for all interfaces available in the switch / all contexts.</li></ul>

## 19.30 switchport map protocols-group

**Command Objective** This command maps the configured protocol group to a particular VLAN ID for an interface. This configuration is used during protocol-VLAN based membership classification.




The no form of the command deletes the entry created for the specified group ID in the Port Protocol Table.

**Syntax**


```
switchport map protocols-group <Group id integer(0-2147483647)> vlan <vlan-id/vfi_id>
```

```
no switchport map protocols-group <Group id integer(0-2147483647)>
```

**Parameter Description**

- **<Group id integer(0-2147483647)>** - Configures a unique group ID that is already created with the specified protocol type and encapsulation frame type. This value represents a specific group that should be associated with a VID. This value ranges between 0 and 2147483647.
- **vlan <vlan-id/vfi-id>** - Maps the configured protocol group to the specified VLAN / VFI ID. This value ranges between 1 and 65535.
  - **<vlan -id>** - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094
  - **<vfi-id>** - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported.
    -  The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.
    -  VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW .
    -  The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.

**Mode** Interface Configuration Mode(Physical / Port Channel)

- 
- The protocol group should have been already created with a specific protocol and encapsulation frame type combination before mapping it to a VID.



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---

- This command is applicable only for the port configured as switch port.
- The protocol group mapping cannot be configured for the port, if the base bridge mode is set as transparent bridging or the VLAN switching feature is shutdown in the switch.

---

**Example**

```
Your Product(config-if)# switchport map protocols-group 1  
vlan 2
```

---

**Related Command(s)**

- `switchport` - Configures the port as switch port.
  - `base bridge-mode dot1q-vlan` - Configures the VLAN operation mode as VLAN aware bridging.
  - `map protocol` - Creates a protocol group with a specific protocol and encapsulation frame type combination.
  - `no shutdown vlan` - Starts and enables VLAN switching feature in the switch.
  - `show protocol-vlan` - Displays all entries in the port protocol table.
-

## 19.31 switchport priority default

**Command Objective** This command configures the default ingress user priority for a port.

This priority is assigned to frames received on the port that does not have a priority assigned to it. This priority value is useful only on media such as Ethernet that does not support native user priority. This value ranges from 0 to 7. The value 0 represents the lowest priority and the value 7 represents the highest priority.

The no form of the command resets the default ingress user priority for the port to its default value.

**Syntax** `switchport priority default <priority value(0-7)>`

`no switchport priority default`

**Mode** Interface Configuration Mode (Physical / Port Channel)

**Default** 0



- This command is applicable only for the port configured as switch port.
- The default user priority cannot be configured for the port, if the base bridge mode is set as transparent bridging or the VLAN switching feature is shutdown in the switch.

**Example** `Your Product(config-if)# switchport priority default 5`

**Related Command(s)**

- `switchport` - Configures the port as switch port.
- `base bridge-mode dot1q-vlan` - Configures the VLAN operation mode as VLAN aware bridging.
- `no shutdown vlan` - Starts and enables VLAN switching feature in the switch.
- `show vlan port config` - Displays the VLAN related port specific information for all interfaces available in the switch / all contexts.

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## 19.32 switchport mode

---

**Command Objective** This command configures the mode of operation for a switch port. This mode defines the way of handling of traffic for VLANs.

The no form of the command resets the mode of operation for the switch port to its default value.

---

**Syntax**

```
switchport mode { access | trunk | hybrid | {private-vlan  
{promiscuous | host }} | {dynamic {auto | desirable}} }  
  
no switchport mode
```

---

**Parameter Description**

- **access** - Configures the port as access port that accepts and sends only untagged. This kind of port is added as a member to specific VLAN only and carries traffic only for the VLAN to which the port is assigned. The port can be set as access port, only if the following 3 conditions are met:
  - The GVRP is disabled for that port.
  - Acceptable frame type is set as “untagged AND priority” tagged.
  - Port is a not a tagged member of any VLAN.
- **trunk** - Configures the port as trunk port that accepts and sends only tagged frames. This kind of port is added as member of all existing VLANs and for any new VLAN created, and carries traffic for all VLANs. The trunk port accepts untagged frames too, if the acceptable frame type is set as all. The port can be set as trunk port, only if the port is not a member of untagged ports for any VLAN in the switch.
- **hybrid** - Configures the port as hybrid port that accepts and sends both tagged and untagged frames.
- **private-vlan** - Configures Pvlan for the specified VLAN switch port.
- **promiscuous** - Communicates with all interfaces, including the isolated and community ports within a PVLAN. The function of the promiscuous port is to move traffic between ports in community or isolated VLANs.
- **host** - Specifies the type of a port in private vlan domain. Untagged member port in a primary or secondary vlan
  - If a host port is a member port of an isolated VLAN, traffic from the host port is sent only to the promiscuous port of the Private VLAN and the trunk port.
  - If a host port is a member port of the community VLAN, traffic from the port can be sent only to other ports of the community VLAN , trunk port and promiscuous port of the private VLAN.
- **dynamic** - Configures the mode as Dynamic Mode. This can be:

---

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- **auto** – Interface converts the link to a trunk link.
  - **desirable** – Interface actively attempts to convert the link to a trunk link
- This feature has been included to adhere to the Industry Standard CLI syntax. This feature is currently not supported.

**Mode** Interface Configuration Mode (Physical / Port Channel)

**Default** hybrid



- This command is applicable only for the port configured as switch port.
- The VLAN port mode cannot be configured for the port, if the base bridge mode is set as transparent bridging or the VLAN switching feature is shutdown in the switch.

**Example** `Your Product(config-if)# switchport mode access`

- Related Command(s)**
- **spanning-tree guard** - Configures the various PVRST guard features such as root guard, in a port.
  - **spanning-tree encap** - Configures the encapsulation type to be used in an interface.
  - **switchport** - Configures the port as switch port.
  - **base bridge-mode dot1q-vlan** - Configures the VLAN operation mode as VLAN aware bridging.
  - **set port gvrp** - Enables or disables GVRP feature on the specified interface.
  - **ports** - Statically configures a VLAN entry with the required member ports, untagged ports and/or forbidden ports, and activates the VLAN.
  - **switchport acceptable-frame-type** - Configures the type of VLAN dependant BPDU frames such as GMRP BPDU, that the port should accept during the VLAN membership configuration.
  - **switchport mode dot1q-tunnel** - Enables dot1q-tunneling on the specified interface
  - **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
  - **show vlan port config** - Displays the VLAN related port specific information for all interfaces available in the switch / all contexts.

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## 19.33 vlan max-traffic-class

**Command Objective** This command configures the maximum number of traffic classes supported on a port.

The number of traffic classes supported depends on the hardware used, which can limit the number of traffic classes to a lower number. SMIS supports eight traffic classes to handle priority traffic. Each traffic is assigned a traffic type based on the time sensitiveness of the traffic. This value ranges between 1 and 8.

The no form of the command resets the maximum traffic class value on the port to its default value.

---

**Syntax** `vlan max-traffic-class <MAX Traffic class(1-8)>`  
`no vlan max-traffic-class`

---

**Mode** Interface Configuration Mode (Physical / Port Channel)

---

**Default** 8



The maximum number of traffic classes supported on the port can be configured, only if the VLAN switching feature is started and enabled in the switch.

---

**Example** `Your Product(config-if)# vlan max-traffic-class 7`

---

**Related Command(s)**

- `vlan map-priority` - Maps an evaluated user priority to a traffic class on a port.
- `no shutdown vlan` - Starts and enables VLAN switching feature in the switch.

---

## 19.34 vlan map-priority

**Command Objective** This command maps an evaluated user priority to a traffic class on a port.

The frame received on the interface with the configured priority is processed in the configured traffic class. Traffic class is used to meet the latency and throughput requirement of time-critical traffic in a LAN environment, where both time-critical and non-time-critical traffic compete for the network bandwidth.

The no form of the command maps the default traffic class to the specified priority value on the port.

**Syntax**

```
vlan map-priority <priority value(0-7)> traffic-class  
<Traffic class value(0-7)>
```

```
no vlan map-priority <priority value (0-7)>
```

**Parameter Description**

- **<priority value(0-7)>** - Configures the priority value to be set for the specified traffic class. This value ranges between 0 and 7. The frames with the configured priority are mapped to the specified traffic class. The priority determined for the received frame is equivalent to the priority indicated in the received tagged frame or one of the evaluated priorities determined based on the media-type. The priority determined is equal to the Default User Priority value for the ingress port, if the untagged frames are received from Ethernet media. The priority determined is equal to the Regen user priority for the ingress port and media-specific user priority, if the untagged frames are received from non-Ethernet media.
- **<Traffic class value(0-7)>** - Configures the traffic class value to which the received frame of specified priority is to be mapped. This value ranges between 0 and 7. Each value represents the concerned traffic. They are:
  - **0 - Best effort.** This represents all kinds of non-detrimental traffic that is not sensitive to QoS metrics such as jitter.
  - **1 - Background.** This represents bulk transfers and other activities that are permitted on the network without impacting the network usage for users and applications.
  - **2 - Standard (spare traffic).** This represents traffic of more importance than background but less importance than excellent load.
  - **3 - Excellent load.** This represents the best effort type service that an information services organization should deliver to its most important customers.
  - **4 - Controlled load.** This represents traffic subject to admission control to assure that the traffic is received even when the network is overloaded.
  - **5 - Interactive voice and video.** This represents traffic having delay less than 100 milli-seconds.

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- **6 - Internetwork control-Layer 3 network control.** This represents traffic having delay less than 10 milli-seconds.
  - **7 - Network control-Layer 2 network control reserved traffic.** This represents traffic that demands special treatment based on its requirements and relative importance.
- The configured traffic class value should be less than the maximum number of traffic classes in the port.

---

**Mode** Interface Configuration Mode (Physical / Port Channel)

---

**Default** The default traffic classes that are mapped to the priority is listed below:

Priority	Traffic Class
1	0
2	1
3	3
4	4
5	5
6	6
7	7



- The default traffic classes mapped to the priority value depends upon the maximum traffic classes supported on the port.
- The evaluated user priority can be mapped to the traffic class, only if the VLAN switching feature is started and enabled in the switch.

---

**Example** `Your Product(config-if)# vlan map-priority 2 traffic-class 2`

---

**Related Command(s)**

- `vlan max-traffic-class` - Configures the maximum number of traffic classes supported on a port.
  - `no shutdown vlan` - Starts and enables VLAN switching feature in the switch.
  - `show vlan traffic-classes` - Displays the evaluated user priority and traffic class mapping information of all interfaces available in the switch / all contexts.
-

## 19.35 mac-map

**Command Objective** This command configures VLAN-MAC address mapping that is used only for MAC-based VLAN membership classification.




In MAC-based VLAN membership classification, VLAN membership classification is done based on the MAC address of the source of received packets.

The no form of the command deletes the specified VLAN-MAC address mapping entry.

**Syntax**

```
mac-map <aa:aa:aa:aa:aa:aa> vlan <vlan-id/vfi-id>
no mac-map <aa:aa:aa:aa:aa:aa>
```

**Parameter Description**

- **<aa:aa:aa:aa:aa:aa>** - Configures the unicast MAC address that should be mapped to the specified VLAN and used for MAC based VLAN membership classification.
- **vlan <vlan-id/vfi-id>** - Maps the MAC Address to the specified VLAN / VFI ID. This value ranges between 1 and 65535.
  - **<vlan -id>** - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094
  - **<vfi-id>** - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This is not supported.
    -  The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.
    -  VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW.
    -  The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.

**Mode** Global Configuration Mode



- Only the VLANs that are activated in the switch can be mapped to the specified MAC address.



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- VLAN-MAC address mapping can be configured in the port, only if the VLAN switching feature is started and enabled in the switch.

---

**Example**


```
Your Product(config)# mac-map 00:11:22:33:44:55 vlan 2
```

---

**Related Command(s)**

- **mac-vlan** - Enables MAC-based VLAN membership classification on all ports of the switch.
  - **vlan active** - Activates a VLAN in the switch.
  - **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
  - **show mac-vlan** - Displays all entries in the MAC map table.
-

## 19.36 switchport filtering-utility-criteria

<b>Command Objective</b>	This command creates filtering utility criteria for the port. This utility criteria is used to reduce the capacity requirement of the filtering database and to reduce the time for which service is affected, by retaining the filtering information learnt prior to a change in the physical topology of the network.
<b>Syntax</b>	<code>switchport filtering-utility-criteria {default   enhanced}</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li><b>default</b> - Allows learning of source MAC from a packet received on the port, only if there is at least one member port for a VLAN mentioned in the packet.</li> <li><b>enhanced</b> - Allows learning of source MAC from a packet received on the port, only if the following conditions are satisfied: <ul style="list-style-type: none"> <li>At least one VLAN that uses the FID includes the reception port and at least one other Port with a port state of Learning or Forwarding in its member set.</li> <li>The operPointToPointMAC parameter is false for the reception port. Or Ingress to the VLAN is permitted through a port other than source and reception. This port can be or not be in the member set for the VLAN.</li> </ul> </li> </ul>
<b>Mode</b>	Interface Configuration Mode (Physical / Port Channel)
<b>Default</b>	default
	<ul style="list-style-type: none"> <li>The filtering utility criteria cannot be configured in the switch, if the base bridge mode is set as transparent bridging or the VLAN switching feature is shutdown in the switch.</li> <li>This command is applicable only for the port configured as switch port.</li> </ul>
<b>Example</b>	<code>Your Product(config-if)# switchport filtering-utility-criteria enhanced</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><code>switchport</code> - Configures the port as switch port.</li> <li><code>base bridge-mode dot1q-vlan</code> - Configures the VLAN operation mode as VLAN aware bridging.</li> <li><code>no shutdown vlan</code> - Starts and enables VLAN switching feature in the switch.</li> <li><code>show vlan port config</code> - Displays the VLAN related port specific information for all interfaces available in the switch / all contexts</li> </ul>

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## 19.37 switchport protected

---

**Command Objective** This command enables switchport protection feature for a port.

This feature set the particular port as protected so that the port does not forward frames received from another protected port present on the same switch.

The no form of the command disables switchport protection feature for the port.

---

**Syntax** `switchport protected`

`no switchport protected`

---

**Mode** Interface Configuration Mode (Physical / Port Channel)

---

**Default** The switchport protection feature is disabled in the port.



- The switchport protection feature cannot be configured in the switch, if the base bridge mode is set as transparent bridging or the VLAN switching feature is shutdown in the switch.
- This command is applicable only for the port configured as switch port.

---

**Example** `Your Product(config-if)# switchport protected`

---

**Related Command(s)**

- `switchport` - Configures the port as switch port.
- `base bridge-mode dot1q-vlan` - Configures the VLAN operation mode as VLAN aware bridging.
- `no shutdown vlan` - Starts and enables VLAN switching feature in the switch.
- `show vlan port config` - Displays the VLAN related port specific information for all interfaces available in the switch / all contexts.

---

## 19.38 debug vlan

**Command Objective** This command enables the tracing of the VLAN sub module as per the configured debug levels. The trace statements are generated for the configured trace levels.

The no form of the command disables the tracing of the VLAN sub module as per the configured debug levels. The trace statements are not generated for the configured trace levels.

This command allows combination of debug levels to be configured (that is, more than one level of trace can be enabled or disabled).

**Syntax**

```
debug vlan { [{fwd | priority | redundancy}]([initshut]
[mgmt] [data] [ctpl] [dump] [os] [failall] [buffer] [all]])
[switch <context_name>] }

no debug vlan [{fwd | priority | redundancy}]([initshut]
[mgmt] [data] [ctpl] [dump] [os] [failall] [buffer] [all]])
[switch <context_name>]}
```

**Parameter Description**


- **fwd** - Sets the submodule as VLAN forward module, for which the tracing is to be done as per the configured debug levels.
- **priority** - Sets the submodule as VLAN priority module, for which the tracing is to be done as per the configured debug levels.
- **redundancy** - Sets the submodule as VLAN redundancy module, for which the tracing is to be done as per the configured debug levels.
- **initshut** - Generates debug statements for init and shutdown traces. This trace is generated on failed initialization and shutting down of VLAN related entries.
- **mgmt** - Generates debug statements for management traces. This trace is generated during failure in configuration of any of the VLAN features.
- **data** - Generates debug statements for data path traces. This trace is generated during failure in packet processing.
- **ctpl** - Generates debug statements for control path traces. This trace is generated during failure in modification or retrieving of VLAN entries.
- **dump** - Generates debug statements for packet dump traces. This trace is currently not used in VLAN module.
- **os** - Generates debug statements for OS resource related traces. This trace is generated during failure in message queues.

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- **failall** - Generates debug statements for all kind of failure traces.
- **buffer** - Generates debug statements for VLAN buffer related traces. This trace is currently not used in VLAN module.
- **all** - Generates debug statements for all kinds of traces.
- **switch <context\_name>** - Configures the tracing of the VLAN submodule for the specified context. This value represents unique name of the switch context. This value is a string of maximum size 32. This parameter is specific to multiple instance feature.

---

<b>Mode</b>	Privileged Exec Mode
<b>Default</b>	Tracing of the VLAN sub module is disabled.
	The VLAN sub module tracing related configuration takes effect in the switch, only if the VLAN switching feature is started and enabled in the switch.
<b>Example</b>	<code>Your Product# debug vlan fwd all</code>
<b>Related Command (s)</b>	<ul style="list-style-type: none"><li>• <b>no shutdown vlan</b> - Starts and enables VLAN switching feature in the switch.</li><li>• <b>show debugging</b> - Displays state of each debugging option.</li></ul>

---

## 19.39 show vlan

**Command Objective** This command displays VLAN entry related information of all active VLANs and VLANs (that are not active) for which the port details are configured.

The information contains the member ports, untagged ports, forbidden ports, VLAN name and the status of that VLAN entry.

**Syntax** `show vlan [{brief | id <vlan-range> | summary | redundancy | ascending}] [ switch <context_name>]`

**Parameter Description**

- **brief** - Displays the VLAN entry related information of all active VLANs and VLANs (that are not active) for which the port details are configured.
- **id <vlan-range>** - Displays the VLAN entry related information for specified VLANs alone. This value denotes the VLAN ID range for which the information needs to be displayed. This value is a string whose maximum size is 9. For example, the value is provided as 4000-4010 to display the information for VLANs IDs from 4000 to 4010. The information is displayed only for the active VLANs and VLANs (that are not active) for which the port details are configured.
- **summary** - Displays only the total number of VLANs existing in the switch. This includes only the active VLANs and VLANs (that are not active) for which the port details are configured. The VLAN entry related information is not displayed.
- **redundancy** - Displays the VLAN entry related information for standby node.
- **ascending** - Displays the VLAN entry related information in ascending order.
- **switch <context\_name>** - Displays the VLAN entry related information or total number of existing VLANs, for the specified context. This value represents unique name of the switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.

**Mode** Privileged EXEC Mode

**Example**

```
Your Product# show vlan brief
Vlan database
-----
Vlan ID      : 1
```

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---

```
Member Ports :Gi0/1, Gi0/2, Gi0/3, Gi0/4, Gi0/5, Gi0/6
              Gi0/7, Gi0/8, Gi0/9, Gi0/10, Gi0/11, Gi0/12
              Gi0/13, Gi0/14, Gi0/15, Gi0/16, Gi0/17,
Gi0/18
              Gi0/19, Gi0/20, Gi0/21, Gi0/22, Gi0/23,
Gi0/24
Untagged Ports:Gi0/1, Gi0/2, Gi0/3, Gi0/4, Gi0/5, Gi0/6
              Gi0/7, Gi0/8, Gi0/9, Gi0/10, Gi0/11, Gi0/12
              Gi0/13, Gi0/14, Gi0/15, Gi0/16, Gi0/17,
Gi0/18
              Gi0/19, Gi0/20, Gi0/21, Gi0/22, Gi0/23,
Gi0/24
Forbidden Ports      : None
Name                :
Status              : Permanent
```

---

Your Product# show vlan summary

Number of vlans : 1

---

## Related Command(s)

- **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
  - **vlan** - Creates a VLAN in the ISS and enters into the config-VLAN mode in which VLAN specific configurations are done.
  - **ports** - Statically configures a VLAN entry with the required member ports, untagged ports and/or forbidden ports, and activates the VLAN.
  - **vlan active** - Activates a VLAN in the switch.
-

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---

## 19.40 show vlan device info

---

**Command Objective** This command displays the VLAN global information that is applicable to all VLANs created in the switch / all contexts.

The information contains VLAN status, VLAN oper status, GVRP status, GMRP status, GVRP oper status, GMRP oper status, MAC-VLAN status, subnet-VLAN status, protocol-VLAN status, bridge mode of the switch, VLAN base bridge mode, VLAN traffic class status, VLAN learning mode, VLAN version number, maximum VLAN ID supported, maximum number of VLANs supported and VLAN unicast MAC learning limit.

---

**Syntax** `show vlan device info [ switch <context_name>]`

---

**Parameter Description**

- `switch <context_name>` - Displays the VLAN global information that is applicable to all VLANs, for the specified context. This value represents unique name of the switch context. This value is a string whose maximum size is 32. For the models without multiple instance feature, it is not required to provide this parameter.

---

**Mode** Privileged EXEC Mode

---

**Example**

```
Your Product# show vlan device info
Vlan device configurations
-----
Vlan Status                : Enabled
Vlan Oper status           : Enabled
Gvrp status                 : Enabled
Gmrp status                 : Disabled
Gvrp Oper status           : Enabled
Gmrp Oper status           : Disabled
Mac-Vlan Status            : Disabled
Subnet-Vlan Status         : Enabled
Protocol-Vlan Status       : Enabled
Bridge Mode                 : Customer Bridge
Base-Bridge Mode           : Vlan Aware Bridge
Traffic Classes             : Enabled
Vlan Operational Learning Mode : IVL
Version number              : 1
Max Vlan id                 : 4094
```

---



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Max supported vlans	: 1024
Unicast mac learning limit	: 150
Filtering Utility Criteria	: Enabled
Unicast mac learning limit	: 768

---

## Related Command(s)

- **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
  - **set vlan** - Globally enables / disables VLAN feature in the switch (that is the status of the VLAN feature is configured for all ports of the switch).
  - **set gvrp** - Globally enables / disables GVRP feature on all ports of a switch.
  - **set gmrp** - Globally enables / disables GMRP feature on all ports of a switch.
  - **mac-vlan** - Enables MAC-based VLAN membership classification on all ports of the switch.
  - **subnet-vlan** - Enables subnet-VLAN based membership classification on all ports of the switch.
  - **protocol-vlan** - Enables protocol-VLAN based membership classification on all ports of the switch.
  - **base bridge-mode** - Configures the base mode (either 802.1d transparent bridge mode or 802.1q vlan aware bridge mode) in which the VLAN feature should operate on the switch.
  - **set vlan traffic-classes** - Enables or disables traffic class feature in a switch on all ports.
  - **vlan learning mode** - Configures the VLAN learning mode to be applied for all ports of the switch.
  - **unicast-mac learning limit** - Configures the unicast-MAC learning limit for a switch.
  - **set filtering-utility-criteria** - Sets the filtering utility criteria to be applied on all ports
-

## 19.41 show vlan device capabilities

<b>Command Objective</b>	This command displays only the list of VLAN features such as traffic class feature, supported in the switch / all contexts.
<b>Syntax</b>	<code>show vlan device capabilities [ switch &lt;context_name&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li><code>switch &lt;context_name&gt;</code> - Displays only the list of supported VLAN features such as traffic class feature, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature. It is not necessary to provide this parameter for the models without multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show vlan device capabilities Vlan device capabilities ----- Extended filtering services Traffic classes Static Entry Individual port IVL capable SVL capable Hybrid capable Configurable Pvid Tagging</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><code>no shutdown vlan</code> - Starts and enables VLAN switching feature in the switch.</li></ul>

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---

## 19.42 show vlan traffic-classes

<b>Command Objective</b>	This command displays the evaluated user priority and traffic class mapping information of all interfaces available in the switch / all contexts.
<b>Syntax</b>	<code>show vlan traffic-classes [{port &lt;interface-type&gt; &lt;interface-id&gt;   switch &lt;context_name&gt;}]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>port</b> - Displays the evaluated user priority and traffic class mapping information of the specified interface. The details to be provided are:<ul style="list-style-type: none"><li>– <b>&lt;interface-type&gt;</b> - Sets the type of interface. The interface can be:<ul style="list-style-type: none"><li>▪ fastethernet – Officially referred to as 100BASE-T standard. This is a version of LAN standard architecture that supports data transfer up to 100 Megabits per second.</li><li>▪ gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.</li><li>▪ extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.</li><li>▪ i-lan – Internal LAN created on a bridge per IEEE 802.1ap.</li></ul></li><li>– <b>&lt;interface-id&gt;</b> - Sets the interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than i-lan. Only i-lan ID is provided, for interface type i-lan.</li></ul></li><li>• <b>switch &lt;context_name&gt;</b> - Displays the evaluated user priority and traffic class mapping information of all interfaces, for the specified context. This value represents unique name of the switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<p><b>Single Instance:</b></p> <pre>Your Product# show vlan traffic-classes Traffic Class table ----- Port      Priority  Traffic Class ----- Gi0/1    0         2 Gi0/1    1         0 Gi0/1    2         1 Gi0/1    3         3</pre>

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---

Gi0/1	4	4
Gi0/1	5	5
Gi0/1	6	6
Gi0/1	7	7
Gi0/2	0	2
Gi0/2	1	0
Gi0/2	2	1
Gi0/2	3	3
Gi0/2	4	4
Gi0/2	5	5
Gi0/2	6	6
Gi0/2	7	7

---

**Related Command(s)**

- **vlan map-priority** - Maps an evaluated user priority to a traffic class on a port.
  - **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
-

## 19.43 show vlan port config

---

<b>Command Objective</b>	This command displays the VLAN related port specific information for all interfaces available in the switch / all contexts. The information contains PVID, acceptable frame type, port mode, filtering utility criteria, default priority value and status of ingress filtering feature, GVRP module, GMRP module, restricted VLAN registration feature, restricted group registration feature, MAC-based VLAN membership, subnet based VLAN membership, protocol-VLAN based membership and port protected feature.
<b>Syntax</b>	<code>show vlan port config [{port &lt;interface-type&gt; &lt;interface-id&gt;   switch &lt;context_name&gt;}]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>port</b> - Displays the VLAN related port specific information for the specified interface. The details to be provided are:<ul style="list-style-type: none"><li>– <b>&lt;interface-type&gt;</b> - Sets the type of interface. The interface can be:<ul style="list-style-type: none"><li>▪ fastethernet – Officially referred to as 100BASE-T standard. This is a version of LAN standard architecture that supports data transfer up to 100 Megabits per second.</li><li>▪ gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.</li><li>▪ extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.</li><li>▪ internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.</li><li>▪ port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.</li><li>▪ virtual – Virtual Interface. This value ranges from 1 to 65535.</li></ul></li><li>– <b>&lt;interface-id&gt;</b> - Sets the interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel.</li></ul></li><li>• <b>switch &lt;context_name&gt;</b> - Displays the VLAN related port specific information, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show vlan port config Vlan Port configuration table -----</pre>

---

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```
Port Gi0/1
Port Vlan ID                : 1
Port Acceptable Frame Type  : Admit All
Port Ingress Filtering      : Disabled
Port Mode                   : Hybrid
Port Gvrp Status           : Enabled
Port Gmrp Status           : Enabled
Port Gvrp Failed Registrations : 0
Gvrp last pdu origin       : 00:00:00:00:00:00
Port Restricted Vlan Registration : Disabled
Port Restricted Group Registration : Disabled
Mac Based Support          : Disabled
Subnet Based Support       : Disabled
Port-and-Protocol Based Support : Enabled
Default Priority           : 0
Filtering Utility Criteria : Default
Port Protected Status      : Disabled
```

```
-----
Port Gi0/2
Port Vlan ID                : 1
Port Acceptable Frame Type  : Admit All
Port Ingress Filtering      : Disabled
Port Mode                   : Hybrid
Port Gvrp Status           : Enabled
Port Gmrp Status           : Enabled
Port Gvrp Failed Registrations : 0
Gvrp last pdu origin       : 00:00:00:00:00:00
Port Restricted Vlan Registration : Disabled
Port Restricted Group Registration : Disabled
Mac Based Support          : Disabled
Subnet Based Support       : Disabled
Port-and-Protocol Based Support : Enabled
Default Priority           : 0
Filtering Utility Criteria : Default
Port Protected Status      : Disabled
```

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---

## Related Command(s)

- **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
  - **switchport pvid** - Configures the PVID on the specified port.
  - **switchport acceptable-frame-type** - Configures the type of VLAN dependant BPDU frames such as GMRP BPDU, that the port should accept during the VLAN membership configuration.
  - **switchport ingress-filter** - Enables ingress filtering feature on the port.
  - **switchport mode** - Configures the mode of operation for a switch port.
  - **set port gvrp** - Enables or disables GVRP feature on the specified interface.
  - **set port gmrp** - Enables or disables GMRP feature on the specified interface.
  - **vlan restricted** - Configures the restricted VLAN registration feature in a port.
  - **group restricted** - Configures the restricted group registration feature in a port.
  - **port protocol-vlan** - Enables protocol-VLAN based membership classification in a port.
  - **switchport priority default** - Configures the default ingress user priority for a port.
  - **switchport filtering-utility-criteria** - Creates filtering utility criteria for the port.
  - **switchport protected** - Enables switchport protection feature for a port.
-

## 19.44 show vlan protocols-group

---

<b>Command Objective</b>	This command displays all entries in the protocol group table. These entries contain protocol group information of the switch / all contexts. The information contain ID of a group, protocol assigned to the group, and frame type assigned to the group.
<b>Syntax</b>	<code>show vlan protocols-group [ switch &lt;context_name&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li><code>switch &lt;context_name&gt;</code> - Displays all entries in the protocol group table, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show vlan protocols-group Protocol Group Table ----- ----- Frame Type      Protocol        Group ----- Enet-v2         IP              1 Snap            Novell         2 -----</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><code>map protocol</code> - Creates a protocol group with a specific protocol and encapsulation frame type combination.</li><li><code>no shutdown vlan</code> - Starts and enables VLAN switching feature in the switch.</li></ul>

---



## 19.45 show protocol-vlan

---

<b>Command Objective</b>	This command displays all entries in the port protocol table. These entries contain VLAN-protocol group mapping information of the switch / all contexts. The information contains ID of a group, ID of a VLAN mapped to the group and ID of interface to which the VLAN-protocol group mapping is assigned.
<b>Syntax</b>	<code>show protocol-vlan [ switch &lt;context_name&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li><code>switch &lt;context_name&gt;</code> - Displays all entries in the port protocol table, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show protocol-vlan Port Protocol Table ----- Port          Group      Vlan ID ----- Gi0/2         1          2 Gi0/1         2          3 -----</pre>
<b>Related Command</b>	<ul style="list-style-type: none"><li><code>switchport map protocols-group</code> - Maps the configured protocol group to a particular VLAN ID for an interface.</li><li><code>no shutdown vlan</code> - Starts and enables VLAN switching feature in the switch.</li></ul>

---

## 19.46 show mac-vlan

<b>Command Objective</b>	This command displays all entries in the MAC map table. These entries contain MAC-VLAN mapping details configured for the interfaces available in the switch / all contexts. The details contain MAC address, ID of VLAN that is mapped to the MAC address, multicast and broadcast status, and MAC-based VLAN membership status.
<b>Syntax</b>	<code>show mac-vlan [{interface &lt;interface-type&gt; &lt;interface-id&gt;   switch &lt;string(32)&gt;}]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>interface</b> - Displays all entries in the MAC map table for the specified interface. The details to be provided are:             <ul style="list-style-type: none"> <li>- <b>&lt;interface-type&gt;</b> - Sets the type of interface. The interface can be:                 <ul style="list-style-type: none"> <li>▪ qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>▪ gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.</li> <li>▪ extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>▪ port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.</li> </ul> </li> <li>- <b>&lt;interface-id&gt;</b> - Sets the interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel.</li> </ul> </li> <li>• <b>switch &lt;string(32)&gt;</b> - Displays all entries in the MAC map table, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.</li> </ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show mac-vlan interface gigabitethernet 0/1  Mac Map Table For Port 1--Mac Vlan Disabled ----- Mac Address          Vlan ID          MCast/Bcast ----- 00:11:11:11:11:11   1                discard</pre>

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```
00:22:22:22:22:22 1 allow
```

---

## Related Command(s)

- **mac-vlan** - Enables MAC-based VLAN membership classification on all ports of the switch.
  - **mac-map** - Configures the VLAN-MAC address mapping that is used only for MAC-based VLAN membership classification.
  - **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
-

## 19.47 show subnet vlan mapping

---

<b>Command Objective</b>	This command displays all entries in the subnet map table. These entries contain VLAN-IP subnet address mapping details configured for the interfaces available in the switch / all contexts. The details contain subnet address, ID of VLAN that is mapped to the subnet address, ARP status, and subnet-based VLAN membership status.
<b>Syntax</b>	<code>show subnet-vlan mapping</code>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show subnet-vlan mapping Subnet Map Table For Port 1--Subnet Vlan Enabled ----- Source IP      Subnet Mask    Vlan ID        ARP Traffic ----- 1.1.1.1        255.0.0.0     4150           allow</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>subnet-vlan</code> - Enables subnet-VLAN based membership classification on all ports of the switch.</li><li>• <code>map subnet</code> - Configures VLAN-IP subnet address mapping that is used only for subnet-VLAN based membership classification.</li><li>• <code>no shutdown vlan</code> - Starts and enables VLAN switching feature in the switch.</li></ul>

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## 19.48 show vlan statistics

**Command Objective** This command displays the unicast / broadcast statistics details of all active VLANs and VLANs (that are not active) for which the port details are configured.

The statistics details include VLAN ID, number of unicast packets received in the VLAN, number of multicast / broadcast packets received in the VLAN, number of unknown unicast packets flooded in the VLAN, number of known unicast packets forwarded in the VLAN, and number of known broadcast packets forwarded in the VLAN.

**Syntax** `show vlan statistics [vlan <vlan-range>] [ switch <context_name>]`

- Parameter Description**
- `vlan <vlan-range>` - Displays the unicast / broadcast statistics details for specified VLANs alone. This value denotes the VLAN ID range for which the details need to be displayed. This value is a string whose maximum size is 9. For example, the value is provided as 4000-4010 to display the details for VLAN IDs from 4000 to 4010. The details are displayed only for the VLANs that are activated and VLANs (that are not active) for which the port details are configured.
  - `switch <context_name>` - Displays the unicast / broadcast statistics details of specified VLANs alone or of all active VLANs and VLANs (that are not active) for which the port details are configured, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.

**Mode** Privileged EXEC Mode

**Example**

```
Your Product# show vlan statistics vlan 1
Software Statistics Enabled
Unicast/broadcast Vlan statistics
-----
Vlan Id                : 1
Unicast frames received : 0
Mcast/Bcast frames received : 0
Unknown Unicast frames flooded : 0
Unicast frames transmitted : 0
Broadcast frames transmitted : 0
Vlan Statistics Collection is Disabled
-----
```

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## Related Command(s)

- **vlan active** - Activates a VLAN in the switch.
  - **ports** - Statically configures a VLAN entry with the required member ports, untagged ports and/or forbidden ports, and activates the VLAN.
  - **clear vlan statistics** - Clears VLAN counters that maintain statistics information on a per VLAN basis. The counter is cleared for all available VLANs or for the specified VLAN.
  - **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
  - **set sw-stats** - Sets the software statistics collection globally in the switch
  - **set vlan counter** - Enables or disables the statistics collection for the specified VLAN.
-

## 19.49 show vlan learning params

---

<b>Command Objective</b>	This command displays the VLAN learning parameter details for all active VLANs and VLANs (that are not active) for which the port details are configured, available in all contexts / in the switch. The details include admin status of unicast MAC learning feature and value representing MAC learning limit and operational status of learning feature.
<b>Syntax</b>	<code>show vlan learning params [vlan &lt;vlan-range&gt;] [ switch &lt;string(32)&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>vlan &lt;vlan-range&gt;</code> - Displays the VLAN learning parameter details for specified VLANs alone. This value denotes the VLAN ID range for which the details need to be displayed. This value is a string whose maximum size is 9. For example, the value is provided as 4000-4010 to display the details for VLAN IDs from 4000 to 4010. The details are displayed only for the VLANs that are activated and VLANs (that are not active) for which the port details are configured.</li><li>• <code>switch &lt;string(32)&gt;</code> - Displays the VLAN learning parameter details of specified VLANs alone or of all active VLANs and VLANs (that are not active) for which the port details are configured, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<p><b>Single Instance</b></p> <pre>Your Product# show vlan learning params Unicast MAC Learning Paramters ----- Vlan Id                : 1 Mac Learning Admin-Status : Enable Mac Learning Oper-Status  : Enable Mac Learning Limit      : 150 -----</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>vlan active</code> - Activates a VLAN in the switch.</li><li>• <code>ports</code> - Statically configures a VLAN entry with the required member ports, untagged ports and/or forbidden ports, and activates the VLAN.</li><li>• <code>set unicast-mac learning</code> - Enables or disables unicast-MAC learning feature for a VLAN.</li></ul>

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- **vlan unicast-mac learning limit** - Configures the unicast-MAC learning limit for a VLAN.
  - **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
-



## 19.50 show mac-address-table

<b>Command Objective</b>	This command displays all static / dynamic unicast and multicast MAC entries created in the MAC address table. These entries contain VLAN ID, unicast / multicast MAC address, unicast backbone MAC address of peer backbone edge bridge, member ports, the type of entry (that is static, learnt and so on), and total number of entries displayed.
<b>Syntax</b>	<pre>show mac-address-table {[[vlan &lt;vlan-range&gt;] [address &lt;aa:aa:aa:aa:aa:aa&gt;] [{interface &lt;interface-type&gt; &lt;interface-id&gt;   switch &lt;context_name&gt; }]]   [redundancy] }</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>vlan &lt;vlan-range&gt;</b> - Displays all static / dynamic unicast and multicast MAC entries created in the MAC address table for the specified VLANs alone. This value denotes the VLAN ID range for which the entries need to be displayed. This value is a string with the maximum size as 9. For example, the value is provided as 4000-4010 to display the entries for VLAN IDs from 4000 to 4010.</li> <li>• <b>address &lt;aa:aa:aa:aa:aa:aa&gt;</b> - Displays all static / dynamic unicast and multicast MAC entries created in the MAC address table for the specified unicast / multicast MAC address.</li> <li>• <b>interface</b> - Displays all static / dynamic unicast and multicast MAC entries for the specified interface. The details to be provided are:             <ul style="list-style-type: none"> <li>• <b>&lt;interface-type&gt;</b> - Sets the type of interface. The interface can be:                 <ul style="list-style-type: none"> <li>▪ qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>▪ gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.</li> <li>▪ extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>▪ port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.</li> </ul> </li> <li>– <b>&lt;interface-id&gt;</b> - Sets the interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel.</li> </ul> </li> <li>• <b>switch &lt;context_name&gt;</b> - Displays all static / dynamic unicast and multicast MAC entries, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.</li> </ul>

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- **redundancy** - Displays all static / dynamic unicast and multicast MAC entries for standby node.

---

**Mode** Privileged EXEC Mode

---

**Example** Your Product# `show mac-address-table`

```
Vlan      Mac Address      Type      ConnectionId
Ports
-----
--
1         00:10:00:00:00:07  Learnt
Gi0/1
2         00:10:00:01:02:03  Learnt
Gi0/1
Total Mac Addresses displayed: 2
```

---

**Related Command(s)**

- `no shutdown vlan` - Starts and enables VLAN switching feature in the switch.
-

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## 19.51 show dot1d mac-address-table

---

**Command Objective** This command displays all static / dynamic unicast and multicast MAC address entries created in the FDB table, when the VLAN base bridge mode is transparent bridging.

These entries contain unicast / multicast MAC address, member ports, and the type of entry (that is static, learnt and so on).

---

**Syntax** `show dot1d mac-address-table [address <aa:aa:aa:aa:aa:aa>] [{interface <interface-type> <interface-id> | switch <context_name>}]`

---

**Parameter Description**

- **address <aa:aa:aa:aa:aa:aa>** - Displays all static / dynamic unicast and multicast MAC entries created in the FDB table for the specified unicast / multicast MAC address.
- **interface** - Displays all static / dynamic unicast and multicast MAC entries for the specified interface. The details to be provided are:
  - **<interface-type>** - Sets the type of interface. The interface can be:
    - **qx-ethernet** – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
    - **gigabitethernet** – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
    - **extreme-ethernet** – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
    - **port-channel** – Logical interface that represents an aggregator which contains several ports aggregated together.
  - **<interface-id>** - Sets the interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel.
- **switch <context\_name>** - Displays static / dynamic unicast and multicast MAC entries for the specified MAC address alone or all entries in the FDB table, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.

---

**Mode** Privileged EXEC Mode

---

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**Example**

```
Your Product# show dot1d mac-address-table
Mac Address          Type      Ports
-----
00:00:d1:20:18:d4   Learnt    Gi0/1
Total Mac Addresses displayed: 1
```

---




**Related Command(s)**

- **mac-address-table static unicast - Transparent Bridging Mode** - Configures a static unicast MAC address in the forwarding database in transparent bridging mode in order to control unicast packets to be processed.
  - **mac-address-table static multicast - Transparent Bridging mode** - Configures a static multicast MAC address in the forwarding database in transparent bridging mode in order to control multicast packets to be processed.
  - **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
-

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## 19.52 show mac-address-table count

<b>Command Objective</b>	This command displays the total number of static / dynamic unicast and multicast MAC address entries created in the FDB table. The count is displayed for all active VLANs, VLANs (that are not active) for which the port details are configured, and VLANs for which the MAC address table entries are created.
<b>Syntax</b>	<code>show mac-address-table count [vlan &lt;vlan-id/vfi-id&gt;] [switch &lt;context_name&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>vlan &lt;vlan-id/vfi-id&gt;</code> - Displays the total number of static / dynamic unicast and multicast MAC address entries created for the specified VLAN / VFI ID. This value ranges between 1 and 65535.<ul style="list-style-type: none"><li>– <code>&lt;vlan -id&gt;</code> - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094</li><li>– <code>&lt;vfi-id&gt;</code> - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported.<ul style="list-style-type: none"><li> The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.</li><li> VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW .</li><li> The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.</li></ul></li></ul></li><li>• <code>switch &lt;context_name&gt;</code> - Displays the total number of static / dynamic unicast and multicast MAC address entries, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode

<b>Example</b>	<pre>Your Product# show mac-address-table count Mac Entries for Vlan 1: ----- Dynamic Unicast Address Count      : 0 Dynamic Multicast Address Count    : 0</pre>
----------------	---

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```
Static Unicast Address Count      : 0
```

```
Static Multicast Address Count    : 0
```

```
-----
```

```
Mac Entries for Vlan 4099:
```

```
-----
```

```
Dynamic Unicast Address Count    : 0
```

```
Dynamic Multicast Address Count   : 0
```

```
Static Unicast Address Count     : 1
```

```
Static Multicast Address Count    : 0
```

```
-----
```

```
Mac Entries for Vlan 4158:
```

```
-----
```

```
Dynamic Unicast Address Count    : 0
```

```
Dynamic Multicast Address Count   : 0
```

```
Static Unicast Address Count     : 0
```

```
Static Multicast Address Count    : 0
```

```
-----
```

---

## Related Command(s)

- **vlan active** - Activates a VLAN in the switch.
  - **ports** - Statically configures a VLAN entry with the required member ports, untagged ports and/or forbidden ports, and activates the VLAN.
  - **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
-

## 19.53 show mac-address-table static unicast

**Command Objective** This command displays all static unicast MAC address entries created in the FDB table.

These entries contain VLAN ID to which unicast MAC address entry is assigned, unicast MAC address, member ports, receiver ports, the status of entry (that is permanent, static and so on), the unicast backbone MAC address of peer backbone edge bridge, and total number of entries displayed.

**Syntax** `show mac-address-table static unicast [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>] [{interface <interface-type> <interface-id> | switch <context_name>}]`

- Parameter Description**
- **vlan <vlan-range>** - Displays all static unicast MAC address entries created in the FDB table for the specified VLANs alone. This value denotes the VLAN ID range for which the entries need to be displayed. This value is a string whose maximum size is 9. For example, the value is provided as 4000-4010 to display the entries for VLAN IDs from 4000 to 4010.
  - **address <aa:aa:aa:aa:aa:aa>** - Displays all static unicast MAC address entries created in the FDB table for the specified unicast MAC address.
  - **interface** - Displays all static unicast MAC address entries for the specified interface. The details to be provided are:
    - **<interface-type>** - Sets the type of interface. The interface can be:
      - qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
      - gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
      - extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
      - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
    - <interface-id>** - Sets the interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel.
  - **switch <context\_name>** - Displays all static unicast MAC entries, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.

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**Mode** Privileged EXEC Mode

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**Example** `Your Product# show mac-address-table static unicast`

```
Vlan Mac Address RecvPort Status ConnectionId
Ports
-----
--
2 00:11:22:33:44:55 Gi0/2 Del-OnTimeout
Gi0/3
Total Mac Addresses displayed: 1
```

---

**Related Command (s)**

- `no shutdown vlan` - Starts and enables VLAN switching feature in the switch.

---



## 19.54 show dot1d mac-address-table static unicast

<b>Command Objective</b>	<p>This command displays all static unicast MAC address entries created in the FDB table, when the VLAN base bridge mode is transparent bridging.</p> <p>These entries contain unicast MAC address, member ports, receiver ports, the status of entry (that is permanent, static and so on), and total number of entries displayed.</p>								
<b>Syntax</b>	<pre>show dot1d mac-address-table static unicast [address &lt;aa:aa:aa:aa:aa:aa&gt;] [interface &lt;interface-type&gt; &lt;interface-id&gt;]</pre>								
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>address &lt;aa:aa:aa:aa:aa:aa&gt;</b> - Displays all static unicast MAC entries created in the FDB table for the specified unicast MAC address.</li> <li>• <b>interface-type</b> - Displays all static unicast MAC entries for the specified interface. The details to be provided are: <ul style="list-style-type: none"> <li>– <b>&lt;interface-type&gt;</b> - Sets the type of interface. The interface can be: <ul style="list-style-type: none"> <li>▪ qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>▪ gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.</li> <li>▪ extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>▪ port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.</li> </ul> </li> </ul> </li> <li>• <b>&lt;interface-id&gt;</b> - Sets the interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel.</li> </ul>								
<b>Mode</b>	Privileged EXEC Mode								
<b>Example</b>	<pre>Your Product# show dot1d mac-address-table static unicast address 00:11:22:33:44:55</pre> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px dashed black;">Mac Address</th> <th style="text-align: left; border-bottom: 1px dashed black;">RecvPort</th> <th style="text-align: left; border-bottom: 1px dashed black;">Status</th> <th style="text-align: left; border-bottom: 1px dashed black;">Ports</th> </tr> </thead> <tbody> <tr> <td>00:11:22:33:44:55</td> <td></td> <td>Permanent</td> <td>Gi0/2</td> </tr> </tbody> </table> <pre>Total Mac Addresses displayed: 1</pre>	Mac Address	RecvPort	Status	Ports	00:11:22:33:44:55		Permanent	Gi0/2
Mac Address	RecvPort	Status	Ports						
00:11:22:33:44:55		Permanent	Gi0/2						

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## Related Command(s)

- **mac-address-table static unicast - Transparent Bridging Mode** - Configures a static unicast MAC address in the forwarding database in transparent bridging mode in order to control unicast packets to be processed.
  - **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
-

## 19.55 show mac-address-table static multicast

**Command Objective** This command displays the static multicast MAC address entries created in the FDB table.

These entries contain VLAN ID to which multicast MAC address entry is assigned, multicast MAC address, member ports, receiver ports, forbidden ports, the status of entry (that is permanent, static and so on), and total number of entries displayed.

**Syntax** `show mac-address-table static multicast [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>] [{interface <interface-type> <interface-id> | switch <context_name>}]`

- Parameter Description**
- **vlan <vlan-range>** - Displays all static multicast MAC address entries created in the FDB table for the specified VLANs alone. This value denotes the VLAN ID range for which the entries need to be displayed. This value is a string whose maximum size is 9. For example, the value is provided as 4000-4010 to display the entries for VLAN IDs from 4000 to 4010.
  - **address <aa:aa:aa:aa:aa:aa>** - Displays all static multicast MAC address entries created in the FDB table for the specified unicast MAC address.
  - **interface** - Displays all static multicast MAC address entries for the specified interface. The details to be provided are:
    - **<interface-type>** - Sets the type of interface. The interface can be:
      - qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
      - gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
      - extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
      - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
    - **<interface-id>** - Sets the interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel.
  - **switch <context\_name>** - Displays all static multicast MAC entries, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.

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<b>Mode</b>	Privileged EXEC Mode
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<b>Example</b>	<pre>Your Product# show mac-address-table static multicast Static Multicast Table ----- Vlan           : 1 Mac Address    : 01:02:03:04:05:06 Receive Port   : Gi0/1 Member Ports   : Gi0/1 Forbidden Ports : Gi0/2 Status         : Permanent ----- Total Mac Addresses displayed: 1</pre>
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<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>no shutdown vlan</code> - Starts and enables VLAN switching feature in the switch.</li></ul>
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## 19.56 show dot1d mac-address-table static multicast

<b>Command Objective</b>	<p>This command displays all static multicast MAC address entries created in the FDB table, when the VLAN base bridge mode is transparent bridging.</p> <p>These entries contain multicast MAC address, member ports, receiver ports, the status of entry (that is permanent, static and so on), and total number of entries displayed.</p>
<b>Syntax</b>	<pre>show dot1d mac-address-table static multicast [address &lt;aa:aa:aa:aa:aa:aa&gt;] [interface &lt;interface-type&gt; &lt;interface-id&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>address &lt;aa:aa:aa:aa:aa:aa&gt;</b> - Displays all static multicast MAC entries created in the FDB table for the specified multicast MAC address.</li> <li>• <b>interface</b> - Displays all static multicast MAC entries for the specified interface. The details to be provided are: <ul style="list-style-type: none"> <li>– <b>&lt;interface-type&gt;</b> - Sets the type of interface. The interface can be: <ul style="list-style-type: none"> <li>▪ qx-ethernet –A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>▪ gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.</li> <li>▪ extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>▪ port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.</li> </ul> </li> <li>– <b>&lt;interface-id&gt;</b> - Sets the interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel.</li> </ul> </li> </ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show dot1d mac-address-table static multicast address 01:00:5E:01:02:03  Mac Address          RecvPort          Type          Ports -----          - 01:00:5E:01:02:03          static          Gi0/2-3  Total Mac Addresses displayed: 1  Your Product# show dot1d mac-address-table static multicast interface gigabitethernet 0/2</pre>

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Mac Address	RecvPort	Type	Ports
-----	-----	----	-----
01:00:5E:01:02:03		static	Gi0/2
01:00:5E:01:02:04		static	Gi0/2

Total Mac Addresses displayed: 2

---

## Related Command(s)

- **mac-address-table static multicast - Transparent Bridging mode**- Configures a static multicast MAC address in the forwarding database in transparent bridging mode in order to control multicast packets to be processed.
  - **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
-

## 19.57 show mac-address-table dynamic unicast

**Command Objective** This command displays all dynamically learnt unicast entries from the MAC address table.

These entries contain VLAN ID for which unicast MAC address entry is learnt, unicast MAC address, ports through which the entry is learnt, the status of entry (that is permanent, static and so on), the unicast backbone MAC address of peer backbone edge bridge, and total number of entries displayed.

**Syntax** `show mac-address-table dynamic unicast [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>] [{interface <interface-type> <interface-id> | switch <context_name>}]`

- Parameter Description**
- **vlan <vlan-range>** - Displays all dynamically learnt unicast entries from the MAC address table for the specified VLANs alone. This value denotes the VLAN ID range for which the entries need to be displayed. This value is a string whose maximum size is 9. For example, the value is provided as 4000-4010 to display the entries for VLAN IDs from 4000 to 4010.
  - **address <aa:aa:aa:aa:aa:aa>** - Displays all dynamically learnt unicast entries from the MAC address table for the specified unicast MAC address.
  - **interface** - Displays all dynamically learnt unicast entries from the MAC address table for the specified interface. The details to be provided are:
    - **<interface-type>** - Sets the type of interface. The interface can be:
      - qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
      - gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
      - extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
      - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
    - **<interface-id>** - Sets the interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel.
  - **switch <context\_name>** - Displays all dynamically learnt unicast entries, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.

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**Mode** Privileged EXEC Mode

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**Example** Your Product# `show mac-address-table dynamic unicast vlan 2`

Vlan	Mac Address	Type	ConnectionId	Ports
2	00:01:02:03:04:21	Learnt		Gi0/1

Total Mac Addresses displayed: 1

---

**Related Command(s)**

- `no shutdown vlan` - Starts and enables VLAN switching feature in the switch.

---



## 19.58 show mac-address-table dynamic multicast

**Command Objective** This command displays all dynamically learnt multicast entries from the MAC address table.

These entries contain VLAN ID for which multicast MAC address entry is learnt, multicast MAC address, ports through which the entry is learnt, the status of entry (that is permanent, static and so on), the unicast backbone MAC address of peer backbone edge bridge, and total number of entries displayed.

**Syntax** `show mac-address-table dynamic multicast [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>] [{interface <interface-type> <interface-id> | switch <context_name>}]`

- Parameter Description**
- **vlan <vlan-range>** - Displays all dynamically learnt multicast entries from the MAC address table for the specified VLANs alone. This value denotes the VLAN ID range for which the entries need to be displayed. This value is a string whose maximum size is 9. For example, the value is provided as 4000-4010 to display the entries for VLAN IDs from 4000 to 4010.
  - **address <aa:aa:aa:aa:aa:aa>** - Displays all dynamically learnt multicast entries from the MAC address table for the specified unicast MAC address.
  - **interface** - Displays all dynamically learnt multicast entries from the MAC address table for the specified interface. The details to be provided are:
    - **<interface-type>** - Sets the type of interface. The interface can be:
      - qx-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
      - gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
      - extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
      - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
    - **<interface-id>** - Sets the interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel.
  - **switch <context\_name>** - Displays all dynamically learnt multicast entries, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature

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**Mode** Privileged EXEC Mode

---

**Example** Your Product# `show mac-address-table dynamic multicast`

Vlan	Mac Address	Type	ConnectionId	Ports
----	-----	----	-----	----
2	01:03:05:07:09:04	Learnt		Gi0/1

Total Mac Addresses displayed: 1

---

**Related Command(s)**

- `no shutdown vlan` - Starts and enables VLAN switching feature in the switch.

---

## 19.59 show mac-address-table aging-time

---

<b>Command Objective</b>	This command displays the ageing time configured for the MAC address table. This time denotes the interval (in seconds) after which the dynamically learned forwarding information entry and static entry in the MAC address table are deleted.
<b>Syntax</b>	<code>show mac-address-table aging-time [ switch &lt;context_name&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li><code>switch &lt;context_name&gt;</code> - Displays ageing time of the MAC address table, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show mac-address-table aging-time Mac Address Aging Time: 300</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><code>mac-address-table aging-time</code> - Configures the timeout period (in seconds) for aging out dynamically learned forwarding information entry and static entry in the MAC address table.</li><li><code>no shutdown vlan</code> - Starts and enables VLAN switching feature in the switch.</li></ul>

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## 19.60 show wildcard

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**Command Objective** This command displays all wildcard MAC entries created in the switch / in all contexts.

The wild card VLAN static filtering information is used for all VLANs for which no static unicast and multicast MAC address entries are created.

---

**Syntax** `show wildcard {mac-address <mac_addr> | broadcast} [switch <context_name>]`

---

**Parameter Description**

- `mac-address <mac_addr>` - Displays the wildcard MAC entries created in the switch / in all contexts, for the specified destination unicast or multicast MAC address to which filtering information of wild card entry is applied.
- `broadcast` - Displays the wildcard MAC entries created in the switch / in all contexts, for the broadcast MAC address (that is, ff:ff:ff:ff:ff:ff).
- `switch <context_name>` - Displays the wildcard MAC entries for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.

---

**Mode** Privileged EXEC Mode

---

**Example** `Your Product# show wildcard mac-address 00:11:22:33:00:00`

```
Wild Card Entries:
-----
Mac Address          Ports
-----,-----
00:11:22:33:00:00   Gi0/2
```

---

**Related Command(s)**

- `wildcard` - Configures the wildcard VLAN entry for a specified MAC address or any MAC address.
- `no shutdown vlan` - Starts and enables VLAN switching feature in the switch.

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## 19.61 shutdown garp

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**Command Objective** This command shuts down the GARP module in the switch on all ports and releases all memories used for the GARP module.

The no form of the command starts and enables the GARP module in the switch on all ports. GMRP and GVRP are enabled explicitly, once the disabled GARP is enabled.

GARP is used to synchronize attribute information between the bridges in the LAN. It allows registering and de-registering attribute values, which are disseminated into the backbone of the GARP participants.

---

**Syntax** `shutdown garp`  
`no shutdown garp`

---

**Mode** Global Configuration Mode

---

**Default** GARP module is started and enabled in the switch on all ports.



- GARP can be started, only if VLAN switching feature is started in the switch.
- GARP can be shutdown, only if GVRP and/or GMRP are disabled.
- GARP cannot be started in the switch, if the base bridge mode is configured as transparent bridging.

---

**Example** `Your Product(config)# shutdown garp`

- 
- Related Command(s)**
- `base bridge-mode` - Configures the base mode (either 802.1d transparent bridge mode or 802.1q vlan aware bridge mode) in which the VLAN feature should operate on the switch.
  - `set gvrp disable` – Globally disables GVRP feature on all ports of a switch.
  - `set port gvrp` - Enables or disables GVRP feature on the specified interface.
  - `set gmrp disable` – Globally disables GMRP feature on all ports of a switch.
  - `set port gmrp` - Enables or disables GMRP feature on the specified interface.
  - `set garp timer` - Configures GARP timers for a port.


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- **vlan restricted** - Configures the restricted VLAN registration feature in a port.
  - **group restricted** - Configures the restricted group registration feature in a port.
  - **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
  - **show garp timer** - Displays the GARP timer information of all interfaces available in the switch / all contexts.
  - **debug garp** - Enables the tracing of the GARP submodule as per the configured debug levels.
-

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## 19.62 set gvrp

<b>Command Objective</b>	<p>This command globally enables or disables GVRP feature on all ports of a switch.</p> <p>GVRP uses the services of GARP to propagate VLAN registration information to other VLAN aware bridges in a LAN. This information allows GVRP aware devices to dynamically establish and update the information about the existence of the VLANs in a topology. The GVRP registers the created VLANs with GARP and de-registers the deleted VLANs from the GARP.</p>
<b>Syntax</b>	<pre>set gvrp { enable   disable }</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>enable</b> - Enables GVRP feature in the switch on all ports and also starts the GARP in the switch if the GARP is disabled.</li><li>• <b>disable</b> - Disables GVRP feature in the switch on all ports.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	enable
	<ul style="list-style-type: none"><li>• GVRP feature can be globally enabled, only if VLAN feature is globally enabled in the switch.</li><li>• GVRP feature should be globally disabled before globally disabling the VLAN feature in the switch.</li><li>• GVRP feature cannot be enabled in the switch, if the base bridge mode is set as transparent bridging or the VLAN switching feature is shutdown in the switch.</li></ul>
<b>Example</b>	<pre>Your Product(config)# set gvrp disable</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>spanning-tree mode</b> - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the switch.</li><li>• <b>set vlan</b> - Globally enables / disables VLAN feature in the switch (that is the status of the VLAN feature is configured for all ports of the switch).</li><li>• <b>base bridge-mode dot1q-vlan</b> - Configures the VLAN operation mode as VLAN aware bridging.</li><li>• <b>shutdown garp</b> - Shuts down the GARP module in the switch on all ports and releases all memories used for the GARP module.</li></ul>

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- **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
  - **show vlan device info** - Displays the VLAN global information that is applicable to all VLANs created in the switch / all contexts.
  - **show gvrp statistics** - Displays GVRP statistics for the specified port.
-



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## 19.63 set port gvrp

**Command Objective** This command enables or disables GVRP feature on the specified interface.

GVRP uses the services of GARP to propagate VLAN registration information to other VLAN aware bridges in a LAN. This information allows GVRP aware devices to dynamically establish and update the information about the existence of the VLANs in a topology. The GVRP registers the created VLANs with GARP and de-registers the deleted VLANs from the GARP.

**Syntax** `set port gvrp <interface-type> <interface-id> { enable | disable }`

- Parameter Description**
- **<interface-type>** - Configures the GVRP feature for the specified type of interface. The interface can be:
    - qx-ethernet – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.
    - gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
    - extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.
    - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
  - **<interface-id>** - Configures the GVRP feature for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. For example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided, for interface type port-channel. For example: 1 represents port-channel ID.
  - **enable** - Enables GVRP feature on the specified interface.
  - **disable** - Disables GVRP feature on the specified interface.

**Mode** Global Configuration Mode

**Default** enable



- The GVRP feature can be configured on the specified interface, only if the GARP module is not shutdown.

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- Any GVRP packet received is discarded and no GVRP registrations are propagated from other ports, if GVRP is globally disabled or GVRP is disabled in the interface.

---

**Example**

```
Your Product(config)# set port gvrp gigabitethernet 0/1  
disable
```

---



**Related Command(s)**

- **no shutdown garp** - Starts and enables the GARP module in the switch on all ports.
  - **switchport mode** - Configures the mode of operation for a switch port.
  - **shutdown garp** - Shuts down the GARP module in the switch on all ports and releases all memories used for the GARP module.
  - **show vlan port config** - Displays the VLAN related port specific information for all interfaces available in the switch / all contexts.
  - **show gvrp statistics** - Displays GVRP statistics for the specified port.
-

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## 19.64 set port gvrp - enable | disable

<b>Command Objective</b>	This command enables or disables GVRP (GARP VLAN Registration Protocol) on the interface.
	This command operates similar to that of the command <code>set port gvrp</code> . This feature has been included in adherence to the Industry Standard CLI syntax.
<b>Syntax</b>	<code>set port gvrp { enable   disable } &lt;interface-id&gt;</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>enable</code> - Enables GVRP on the interface</li><li>• <code>disable</code> - Disables GVRP on the interface</li><li>• <code>&lt;interface-id&gt;</code> - Configures the GVRP feature for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than i-lan and port-channel. For example: 0/1 represents that the slot number is 0 and port number is 1. Only i-lan and port-channel ID is provided, for interface types i-lan and port-channel. For example: 1 represents i-lan and port-channel ID.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	enable
	<ul style="list-style-type: none"><li>• The value enable indicates that GVRP is enabled on the current port, as long as global GVRP status is also enabled for the device</li><li>• If port GVRP state is disabled, but global GVRP status is still enabled, then GVRP is disabled on current port. Any received GVRP packets will be discarded and no GVRP registrations will be propagated from other ports</li></ul>
<b>Example</b>	<code>Your Product(config)# set port gvrp disable 0/1</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show vlan port config</code> - Displays the vlan related parameters specific for ports</li></ul>


---

## 19.65 set gmrp

<b>Command Objective</b>	<p>This command globally enables or disables GMRP feature on all ports of a switch.</p> <p>GMRP uses the services of GARP to propagate multicast information to the bridges in a LAN. This information allows GMRP aware devices to reduce the transmission of multicast traffic to the LANs, which do not have any members of that multicast group. GMRP registers and de-registers the group membership information and group service requirement information with the GARP.</p>
<b>Syntax</b>	<code>set gmrp { enable   disable }</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li><b>enable</b> - Enables GMRP feature in the switch on all ports and also starts the GARP in the switch if the GARP is disabled..</li> <li><b>disable</b> - Disables GMRP feature in the switch on all ports.</li> </ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	enable
	<ul style="list-style-type: none"> <li>GMRP feature can be globally enabled, only if VLAN feature is globally enabled in the switch.</li> <li>GMRP feature should be globally disabled before globally disabling the VLAN feature in the switch.</li> <li>GMRP feature cannot be configured in the switch, if the base bridge mode is set as transparent bridging or the VLAN switching feature is shutdown in the switch.</li> </ul>
<b>Example</b>	<code>Your Product(config)# set gmrp disable</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><b>set vlan</b> - Globally enables / disables VLAN feature in the switch (that is the status of the VLAN feature is configured for all ports of the switch).</li> <li><b>base bridge-mode dot1q-vlan</b> - Configures the VLAN operation mode as VLAN aware bridging.</li> <li><b>shutdown garp</b> - Shuts down the GARP module in the switch on all ports and releases all memories used for the GARP module.</li> <li><b>no shutdown vlan</b> - Starts and enables VLAN switching feature in the switch.</li> <li><b>show vlan device info</b> - Displays the VLAN global information that is applicable to all VLANs created in the switch / all contexts.</li> <li><b>show gmrp statistics</b> - Displays GMRP statistics for the specified port.</li> </ul>

## 19.66 set port gmrp

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<b>Command Objective</b>	This command enables or disables GMRP feature on the specified interface.  GMRP uses the services of GARP to propagate multicast information to the bridges in a LAN. This information allows GMRP aware devices to reduce the transmission of multicast traffic to the LANs, which do not have any members of that multicast group. GMRP registers and de-registers the group membership information and group service requirement information with the GARP.
<b>Syntax</b>	<pre>set port gmrp &lt;interface-type&gt; &lt;interface-id&gt; { enable   disable }</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;interface-type&gt;</b> - Configures the GMRP feature for the specified type of interface. The interface can be:<ul style="list-style-type: none"><li>– qx-ethernet – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.</li><li>– gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.</li><li>– extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.</li><li>– port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.</li></ul></li><li>• <b>&lt;interface-id&gt;</b> - Configures the GMRP feature for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. For example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided, for interface type port-channel. For example: 1 represents port-channel ID.</li><li>• <b>enable</b> - Enables GMRP feature on the specified interface.</li><li>• <b>disable</b> - Disables GMRP feature on the specified interface.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	enable
	<ul style="list-style-type: none"><li>• The GMRP feature can be configured on the specified interface, only if the GARP module is not shutdown.</li><li>• Any GMRP packet received is discarded and no GMRP registrations are propagated from other ports, if GMRP is globally disabled or GMRP is disabled in the interface.</li></ul>

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<b>Example</b>	<code>Your Product(config)# set port gmrp gigabitethernet 0/1 disable</code>
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- |                           |   |
|---------------------------|---|
| <b>Related Command(s)</b> | <ul style="list-style-type: none"><li>• <code>no shutdown garp</code> - Starts and enables the GARP module in the switch on all ports.</li><li>• <code>show vlan port config</code> - Displays the VLAN related port specific information for all interfaces available in the switch / all contexts.</li><li>• <code>show gmrp statistics</code> - Displays GMRP statistics for the specified port.</li></ul> |
|---------------------------|---|
-

## 19.67 set garp timer

---

**Command Objective** This command configures GARP timers for a port. GARP uses these timer values to control the transmission of GARP PDUs used in synchronizing attribute information between the switches, and in registering and de-registering of attribute values. The configured GARP timer values are applicable for both GVRP and GMRP application of the GARP module.

---

**Syntax** `set garp timer {join | leave | leaveall} <time in milli seconds>`

---

**Parameter Description**

- `join <time in milli seconds>` - Configures the time interval (in milli-seconds) till which a GARP participant should wait for its join message to be acknowledged before re-sending the join message. The join message is re-transmitted only once, if the initial message is not acknowledged. This time is started, once the initial join message is sent. The join message is sent by a GARP participant to another GARP participant for registering:
  - Its attributes with other participant
  - Its manually configured attributes
  - Attributes received from a third GARP participantThis value can be multiple of tens only (that is, as 210, 220, 230 and so on) This value should satisfy the condition:  $GarpJoinTime > 0$  and  $(2 * GarpJoinTime) < GarpLeaveTime$ .
- `leave <time in milli seconds>` - Configures the time interval (in milli-seconds) till which a GARP participant should wait for any join message before removing attribute details (that is, waiting time for a registrar to move from empty state (MT) to leave state (LV)). This time is started, once a leave message is sent to de-register the attribute details. The leave messages are sent from a GARP participant to another participant, when:
  - Its attributes should be de-registered
  - Its attributes are manually de-registered
  - It receives leave messages from a third GARP participantThis value can be multiple of tens only (that is, as 610, 620, 630 and so on). The leave time should be greater than or two times as that of the `GarpJoinTime`. That is, the maximum value of the leave time cannot be more than two times of the join time. For example, if you configure join time as 500 milliseconds, then the leave time value can be from 510 milliseconds to 1000 milliseconds only.
- `leaveall <time in milli seconds>` - Configures the time interval (in milli-seconds) till which the details of the registered attributes are maintained. The attribute details should be re-registered after this time interval. A leaveall message is sent from a GARP participant to other GARP participants, after this time interval. This time is started, once a GARP participant starts/once re-registration is done. The leaveall messages are sent from a GARP participant to other participants for:

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- De-registering all registered attributes

- Re-registering all attributes with each of the participants

This value can be multiple of tens only (that is, as 10010, 10020 and so on). The leaveall time should be greater than 0 and greater than GarpLeaveTime.

---


<b>Mode</b>	Interface Configuration Mode (Physical)
<b>Default</b>	<ul style="list-style-type: none"><li>• join - 200</li><li>• leave - 600</li><li>• leaveall - 10000</li></ul>
	<ul style="list-style-type: none"><li>• The GARP timers cannot be set as zero.</li><li>• The GARP timers can be configured, only if the GARP module is not shutdown.</li></ul>
<b>Example</b>	<code>Your Product(config-if)# set garp timer join 250</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>no shutdown garp</code> - Starts and enables the GARP module in the switch on all ports.</li><li>• <code>show garp timer</code> - Displays the GARP timer information of all interfaces available in the switch / all contexts.</li></ul>

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## 19.68 vlan restricted

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<b>Command Objective</b>	This command configures the restricted VLAN registration feature in a port. This feature configures the dynamic registration of VLAN.
<b>Syntax</b>	<code>vlan restricted {enable   disable}</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>enable</b> - Enables restricted VLAN registration feature in the port. The creation or modification of a dynamic VLAN entry is permitted only for VLANs for which static VLAN registration entries exist.</li><li>• <b>disable</b> - Disables restricted VLAN registration feature in the port. The creation or modification of a dynamic VLAN entry is permitted for all VLANs.</li></ul>
<b>Mode</b>	Interface Configuration Mode (Physical)
<b>Default</b>	disable
	The restricted VLAN registration feature can be configured in the port, only if the GARP module is started and enabled in the switch.
<b>Example</b>	<code>Your Product(config-if)# vlan restricted enable</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>no shutdown garp</code> - Starts and enables the GARP module in the switch on all ports.</li><li>• <code>show vlan port config</code> - Displays the VLAN related port specific information for all interfaces available in the switch / all contexts.</li></ul>

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## 19.69 group restricted

<b>Command Objective</b>	This command configures the restricted group registration feature in a port. This feature enables you to restrict the multicast groups learnt through GMRP learning.
<b>Syntax</b>	<code>group restricted {enable   disable }</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>enable</b> - Enables restricted group registration feature in the port. The multicast group attribute / service requirement attribute is learnt dynamically from the GMRP frame only if the specific attribute is statically configured in the switch.</li><li>• <b>disable</b> - Disables restricted group registration feature in the port. The GMRP packets are processed normally and the multicast group attribute/service requirement attribute are learnt dynamically even if they are not statically configured in the switch.</li></ul>
<b>Mode</b>	Interface Configuration Mode (Physical)
<b>Default</b>	disable
	The restricted group registration feature can be configured in the port, only if the GARP module is started and enabled in the switch.
<b>Example</b>	<code>Your Product(config-if)# group restricted enable</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>no shutdown garp</code> - Starts and enables the GARP module in the switch on all ports.</li><li>• <code>show vlan port config</code> - Displays the VLAN related port specific information for all interfaces available in the switch / all contexts.</li></ul>

## 19.70 debug garp

**Command Objective** This command enables the tracing of the GARP sub module as per the configured debug levels. The trace statements are generated for the configured trace levels.

The no form of the command disables the tracing of the GARP sub module as per the configured debug levels. The trace statements are not generated for the configured trace levels.

This command allows combination of debug levels to be configured (that is, more than one level of trace can be enabled or disabled). The debug levels are configured one after the other and not in single execution of the command.

### Syntax

```
debug garp { global | [{protocol | gmrp | gvrp |  
redundancy} [initshut] [mgmt] [data] [ctpl] [dump] [os]  
[failall] [buffer] [all]] [switch <context_name>] }
```

```
no debug garp { global | [{protocol | gmrp | garp |  
redundancy} [initshut] [mgmt] [data] [ctpl] [dump] [os]  
[failall] [buffer] [all]] [switch <context_name>] }
```

### Parameter Description


- **global** - Generates debug statements for all kinds of traces.
- **protocol** - Sets the submodule as GARP module, for which the tracing is to be done as per the configured debug levels.
- **gmrp** - Sets the submodule as GMRP module, for which the tracing is to be done as per the configured debug levels.
- **gvrp** - Sets the submodule as GVRP module, for which the tracing is to be done as per the configured debug levels.
- **redundancy** - Sets the submodule as GARP redundancy module, for which the tracing is to be done as per the configured debug levels.
- **initshut** - Generates debug statements for init and shutdown traces. This trace is generated on failed initialization and shutting down of GARP related entries.
- **mgmt** - Generates debug statements for management traces. This trace is generated during failure in configuration of any of the GARP features.
- **data** - Generates debug statements for data path traces. This trace is generated during failure in packet processing.
- **ctpl** - Generates debug statements for control path traces. This trace is generated during failure in modification or retrieving of GARP entries.

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- **dump** - Generates debug statements for packet dump traces. This trace is currently not used in GARP module.
- **os** - Generates debug statements for OS resource related traces. This trace is generated during failure in message queues.
- **failall** - Generates debug statements for all kind of failure traces.
- **buffer** - Generates debug statements for GARP buffer related traces. This trace is currently not used in GARP module.
- **all** - Generates debug statements for all kinds of traces.
- **switch <context\_name>** - Configures the tracing of the GARP submodule for the specified context. This value represents unique name of the switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.

---

<b>Mode</b>	Privileged Exec Mode
<b>Default</b>	Tracing of the GARP sub module is disabled.
	The GARP sub module tracing can be configured in the switch, only if the GARP module is started and enabled in the switch on all ports.
<b>Example</b>	<b>Your Product# debug garp gvrp all</b>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>no shutdown garp</b> - Starts and enables the GARP module in the switch on all ports.</li><li>• <b>show debugging</b> - Displays state of each debugging option.</li></ul>

---

## 19.71 show garp timer

<b>Command Objective</b>	This command displays the GARP timer information of all interfaces available in the switch / all contexts. The information contain the interface type, interface ID, GARP join time, GARP leave time and GARP leave all time.
<b>Syntax</b>	<code>show garp timer [{ port &lt;interface-type&gt; &lt;interface-id&gt;   switch &lt;context_name&gt;}]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>port</b> - Displays the GARP timer information of the specified interface. The details to be provided are: <ul style="list-style-type: none"> <li>- <b>&lt;interface-type&gt;</b> - Sets the type of interface. The interface can be: <ul style="list-style-type: none"> <li>▪ qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>▪ gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.</li> <li>▪ extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>▪ port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.</li> </ul> </li> <li>- <b>&lt;interface-id&gt;</b> - Sets the interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel.</li> </ul> </li> <li>• <b>switch &lt;context_name&gt;</b> - Displays the GARP timer information of all interfaces, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.</li> </ul>
<b>Mode</b>	Privileged EXEC Mode
	This command can be executed in the switch, only if the GARP module is not shutdown and VLAN switching feature is started and enabled in the switch.
<b>Example</b>	<pre>Your Product# show garp timer port gigabitethernet 0/1 Garp Port Timer Info (in milli seconds) ----- Port      Join-time    Leave-time   Leave-all-time ----- Gi0/1    200          600          10000</pre>

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## Related Command(s)

- `set garp timer` - Configures GARP timers for a port.
  - `no shutdown garp` - Starts and enables the GARP module in the switch on all ports.
  - `no shutdown vlan` - Starts and enables VLAN switching feature in the switch.
-

## 19.72 switchport unicast-mac learning

<b>Command Objective</b>	This command enables / disables unicast-MAC learning for the port.
<b>Syntax</b>	<code>switchport unicast-mac learning { enable   disable }</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li><b>enable</b> - Enables unicast-MAC learning for the port. When Mac Learning is enabled, unicast mac entries will be learnt on this port. Configuration of this object will not get affected by the Global MacLearning Status</li><li><b>disable</b> - Disables unicast-MAC learning for the port. When Unicast Mac Learning is disabled, no unicast mac entry will be learnt on this port.</li></ul>
<b>Mode</b>	Interface Configuration Mode (Physical / Port channel)
<b>Default</b>	enable
<b>Example</b>	<pre>Your Product(config-if)# switchport unicast-mac learning enable</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><code>show [provider-bridge] port config</code> - Displays Service VLAN port information</li></ul>

## 19.73 private-vlan


<b>Command Objective</b>	<p>This command configures the private vlan type for the vlan to provide layer 2 isolation between the ports within the same broadcast domain.</p> <p>The no form of the command removes the pvlan type for the vlan.</p>
<b>Syntax</b>	<pre>private-vlan { primary   isolated   community }  no private-vlan</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>primary</b> - Encompasses the entire private VLAN domain. It is a part of each subdomain and provides the Layer 3 gateway out of the VLAN. A private VLAN domain has only one primary VLAN. Every port in a private VLAN domain is a member of the primary VLAN</li><li>• <b>isolated</b> - Configures an isolated VLAN which is a secondary VLAN in which all hosts connected to its ports are isolated at Layer 2. An isolated port has complete Layer 2 separation from the other ports within the same PVLAN, but not from the promiscuous ports. Traffic from isolated port is forwarded only to promiscuous ports.</li><li>• <b>community</b> - Configures a community VLAN which is a secondary VLAN that is associated to a group of ports that connect to a certain "community" of end devices with mutual trust relationships. Community ports communicate among themselves and with their promiscuous ports. These interfaces are separated at Layer 2 from all other interfaces in other communities or isolated ports within their PVLAN.</li></ul>
<b>Mode</b>	Config-VLAN Mode
	This command executes only if the VLAN is created without IVR interface.
<b>Example</b>	<pre>Your Product(config-vlan)# private-vlan primary</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>show vlan private-vlan</b> - Displays the private-VLAN information for the switch</li></ul>




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## 19.74 private-vlan association

<b>Command Objective</b>	<p>This command maps the list of vlans to a primary vlan and associates a specified secondary VLAN with the primary VLAN to function as a PVLAN domain in the running configuration.</p> <p>The no form of the command removes the secondary vlan from the primary vlan association.</p>
<b>Syntax</b>	<pre>private-vlan association [{add remove}] &lt;secondary_vlan_list&gt;</pre> <pre>no private-vlan association</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>add</b> - Adds the given list of vlans to the existing secondary vlan list</li><li>• <b>remove</b> - Removes the given list of vlans from the existing secondary vlan list</li><li>• <b>&lt;secondary_vlan_list&gt;</b> - Replaces the existing vlans with the given list of secondary vlans, if add and remove is not given. This value ranges between 1 and 4094. Use comma as a separator without space while configuring list of vlans. Example: 502,4094.</li></ul>
<b>Mode</b>	Config-VLAN Mode
	This command executes only when primary and secondary vlan are created.
<b>Example</b>	<pre>Your Product(config-vlan)# private-vlan association add 303,1000</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>private-vlan</b> - Configures the private vlan type for the vlan to provide layer 2 isolation between the ports</li><li>• <b>show vlan private-vlan</b> - Displays the private-VLAN information for the switch</li></ul>

## 19.75 switchport private-vlan host-association

<b>Command Objective</b>	<p>This command configures the association between the primary and secondary vlan id to host port.</p> <p>The no form of the command deletes the primary and secondary vlan id association from host.</p>
<b>Syntax</b>	<pre>switchport private-vlan host-association &lt;primary-vlanId(1-4094)&gt; &lt;secondary-vlanId(1-4094)&gt;</pre> <pre>no switchport private-vlan host-association</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;primary-vlanId(1-4094)&gt;</b> - Configures a unique value that represents the specific Primary VLAN to which the switch port has to be associated. This value ranges between 1 and 4094</li><li>• <b>&lt;secondary-vlanId(1-4094)&gt;</b> - Configures a unique value that represents the specific secondary to which the switch port has to be associated. This value ranges between 1 and 4094.</li></ul>
<b>Mode</b>	Interface configuration mode(Physical / Port channel)
	This command executes only when primary and secondary vlan are created and configured
<b>Example</b>	Your Product(config-if)# <code>switchport private-vlan host-association 35 55</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>private-vlan</code> - Configures the private vlan type for the vlan to provide layer 2 isolation between the ports</li><li>• <code>show vlan private-vlan</code> - Displays the private-VLAN information for the switch</li></ul>

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## 19.76 switchport private-vlan mapping

<b>Command Objective</b>	<p>This command maps the Private VLAN promiscuous port to the primary VLAN and to the selected secondary VLANs.</p> <p>The no form of the command unmaps the primary and secondary vlan association for this promiscuous port.</p>
<b>Syntax</b>	<pre>switchport private-vlan mapping &lt;primary_vlan_id(1-4094)&gt; [add   remove] [&lt;secondary_vlan_list&gt;]  no switchport private-vlan mapping</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;primary_vlan_id(1-4094)&gt;</b> - Configures a unique value that represents the specific Primary VLAN to which the promiscuous switchport is to be mapped. This value ranges between 1 and 4094.</li><li>• <b>add</b> - Maps the list of secondary vlan id to this primary VLAN ID and switch port.</li><li>• <b>remove</b> - Unmaps the given list of primary VLAN ID from the existing secondary vlan list.</li><li>• <b>&lt;secondary_vlan_list&gt;</b> - Configures the list of secondary vlan id to which the promiscuous port is associated in the Private VLAN domain. This value ranges between 1 and 4094. Use comma as a separator without space while configuring list of vlans. Example: 502,4094.</li></ul>
<b>Mode</b>	Interface configuration mode (Physical / Port channel)
<b>Example</b>	<pre>Your Product(config-if)# switchport private-vlan mapping 34 add 35,36</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>show vlan private-vlan</b> - Displays the private-VLAN information for the switch</li></ul>

## 19.77 show vlan private-vlan

<b>Command Objective</b>	This command displays the private-VLAN information for the switch.
<b>Syntax</b>	<code>show vlan private-vlan [{primary   isolated   community}] [switch &lt;context_name&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li><code>primary</code> - Displays the private VLAN information for primary primary, VLAN.</li> <li><code>isolated</code> - Displays the private VLAN information for isolated VLAN.</li> <li><code>community</code> - Displays the private VLAN information for community VLAN.</li> <li><code>switch &lt;context_name&gt;</code> - Displays private vlan information for the specified context. This value represents unique name of the switch context. This value is a string of maximum size 32. This parameter is specific to multiple instance feature.</li> </ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show vlan private-vlan Switch default switch default VlanId   Type      Primary VlanId  Ports -----  - 2        isolated   10 10       primary    - Your Product # show vlan private-vlan isolated Switch default switch default VlanId   Type      Primary VlanId  Ports -----  - 2        isolated   10</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><code>private-vlan</code> - Configures the private vlan type for the vlan to provide layer 2 isolation between the ports.</li> <li><code>private-vlan association</code> - Maps the list of vlans to a primary vlan and associates a specified secondary VLAN with the primary VLAN to function as a PVLAN domain in the running configuration.</li> </ul>

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- **switchport private-vlan host-association** – Configures the association between the primary and secondary vlan id to host port.
  - **switchport private-vlan mapping** - Maps the Private VLAN promiscuous port to the primary VLAN and to the selected secondary VLANs.
-

## 19.78 set filtering-utility-criteria

<b>Command Objective</b>	This command sets the filtering utility criteria to be applied on all ports.
<b>Syntax</b>	<code>set filtering-utility-criteria { enable   disable }</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li><b>enable</b> - Applies the filtering utility criteria configured on the port. It can be default or enhanced. If enhanced filtering utility criteria is selected on a port, then learning of source mac from a received packet on that port will be done if the following are satisfied: <ul style="list-style-type: none"> <li>If at least one VLAN that uses the FID includes the reception Port and at least one other Port with a Port State of Learning or Forwarding in its member set, and: <ul style="list-style-type: none"> <li>The operPointToPointMAC parameter is false for the reception Port; or</li> <li>Ingress to the VLAN is permitted through a third Port. The third port can, but is not required to, be in the member set.</li> </ul> </li> </ul> </li> <li><b>disable</b> - Sets default filtering utility criteria to be applied on all ports. If default filtering utility Criteria is selected on a port, then learning of source mac from a received packet on that port will be done only if there is atleast on member port in that vlan.</li> </ul>
<b>Mode</b>	Global Configuration Mode / Switch Configuration Mode
<b>Default</b>	enable
<b>Example</b>	<code>Your Product(config)# set filtering-utility-criteria enable</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><code>show vlan device info</code> - Displays the VLAN global information that is applicable to all VLANs created in the switch / all contexts</li> </ul>


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## 19.79 set sw-stats

<b>Command Objective</b>	This command sets the software statistics collection globally in the switch.
<b>Syntax</b>	<code>set sw-stats { enable   disable }</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>enable</b> - Enables Software statistics collection globally in the switch and the statistics will be stored in the software. This value can be set only if data switching is done by the software.</li><li>• <b>disable</b> - Disables Software statistics collection globally in the switch. The statistics collection will be done by the hardware and will not be stored in software</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	If data switching is done by software, then the default value is enabled else by default statistics collection by the software is disabled.
<b>Example</b>	<code>Your Product(config)# set sw-stats enable</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>show vlan statistics</b> - Displays the unicast / broadcast statistics details of all active VLANs and VLANs (that are not active) for which the port details are configured.</li></ul>

## 19.80 set vlan counter

<b>Command Objective</b>	This command enables or disables the statistics collection for the specified VLAN.
<b>Syntax</b>	<code>set vlan counter { enable   disable }</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>enable</code> - Enables statistics collection for the VLAN.</li><li>• <code>disable</code> - Disables statistics collection for the VLAN.</li></ul>
<b>Mode</b>	Config VLAN Mode
<b>Default</b>	disable
	This command executes only if the VLAN is set to active or if the member ports are associated with the VLAN.
<b>Example</b>	<code>Your Product(config)# set vlan counter enable</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>vlan active</code> - Activates a VLAN in the switch.</li><li>• <code>ports</code> - Configures a VLAN entry with the required member ports, untagged ports and/or forbidden ports, and activates the VLAN.</li><li>• <code>show vlan statistics</code> - Displays the unicast / broadcast statistics details of all active VLANs and VLANs (that are not active) for which the port details are configured.</li></ul>



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## 19.81 clear mac-address-table dynamic

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**Command Objective** This command clears the dynamically learnt MAC Addresses.

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**Syntax** `clear mac-address-table dynamic [interface {port-channel <port-channel-id (1-65535)> | <interface-type> <interface-id>}] [vlan <vlan_vfi_id>]`

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**Parameter Description**

- **port-channel <port-channel-id (1-65535)>** - Clears the FDB entries for the specified port channel interface. Port-Channel are logical interfaces that represents an aggregator which contains several ports aggregated together. This value ranges between 1 and 65535
- **<interface-type>** - Clears the FDB entries for the specified type of interface. The interface can be:
  - qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
  - gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
  - extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
- **<interface-id>** - Clears the FDB entries for the interface identifier of the specified type of interface. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel is provided, for interface type port-channel.
- **vlan <vlan-id/vfi-id>** - Clears the FDB entries for the specified VLAN / VFI ID. This value ranges between 1 and 65535.
  - **<vlan -id>** - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094
  - **<vfi-id>** - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported.
    -  The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.
    -  VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW.
    -  The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is

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displayed for any value beyond this range.

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**Mode** Global Configuration Mode/ Switch Configuration Mode

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**Example** `Your Product(config)# clear mac-address-table dynamic`

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**Related Command(s)**


- `show mac-address-table static unicast` - Displays the statically configured unicast address from the MAC address table.
- `show mac-address-table static multicast` - Displays the statically configured multicast entries.

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## 18.82 debug vlan global

<b>Command Objective</b>	<p>This command enables tracing in VLAN sub module and generates debug statements for global traces.</p> <p>The no form of the disables tracing of the VLAN sub module .</p>
<b>Syntax</b>	<pre>debug vlan global</pre> <pre>no debug vlan global</pre>
<b>Mode</b>	Privilege Exec Mode
<b>Default</b>	Tracing of the VLAN sub module is disabled.
	The VLAN sub module tracing related configuration takes effect in the switch, only if the VLAN switching feature is started and enabled in the switch.
<b>Example</b>	<pre>Your Product# debug vlan global</pre>
<b>Related Command (s)</b>	<ul style="list-style-type: none"><li>• <code>no shutdown vlan</code> - Starts and enables VLAN switching feature in the switch.</li><li>• <code>show debugging</code> - Displays state of each debugging option.</li></ul>

## 19.83 show gmrp statistics

<b>Command Objective</b>	This command displays GMRP statistics for the specified port.
<b>Syntax</b>	<pre>show gmrp statistics [{ port &lt;interface-type&gt; &lt;interface-id&gt; }]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;interface-type&gt;</b> - Displays GMRP statistics for the specified type of interface. The interface can be:<ul style="list-style-type: none"><li>– <b>qx-ethernet</b> – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.</li><li>– <b>gigabitethernet</b> – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.</li><li>– <b>extreme-ethernet</b> – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.</li><li>– <b>port-channel</b> – Logical interface that represents an aggregator which contains several ports aggregated together.</li><li>– <b>pw</b> - Pseudowire (PW) is a emulation of a point-to-point connection over a <a href="#">packet-switching</a> network (PSN). This value ranges between 1 and 65535. Maximum number of PseudoWire interfaces supported in the system is 100. This interface type is not supported.</li><li>– <b>ac</b> - Attachment Circuit (AC) is a physical or virtual circuit attaching a Customer Edge to a Provider Edge port. This value ranges between 1 and 65535. This interface type is not supported.</li></ul></li><li>• <b>&lt;interface-id&gt;</b> - Displays GMRP statistics for the interface id of the specified type of interface. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show gmrp statistics gi 0/1</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>set gmrp</b> – Globally enables or disables GMRP feature on all ports of a switch</li><li>• <b>set port gmrp</b> - Enables or disables GMRP feature on the specified interface</li></ul>

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## 19.84 show gvrp statistics

<b>Command Objective</b>	This command displays GVRP statistics in the system or for the specified port.
<b>Syntax</b>	<code>show gvrp statistics [{ port &lt;interface-type&gt; &lt;interface-id&gt; }]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;interface-type&gt;</b> - Displays GVRP statistics for the specified type of interface. The interface can be:<ul style="list-style-type: none"><li>– <b>qx-ethernet</b> – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.</li><li>– <b>gigabitethernet</b> – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.</li><li>– <b>extreme-ethernet</b> – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.</li><li>– <b>port-channel</b> – Logical interface that represents an aggregator which contains several ports aggregated together.</li><li>– <b>pw</b> - Pseudowire (PW) is a emulation of a point-to-point connection over a <a href="#">packet-switching</a> network (PSN). This value ranges between 1 and 65535. Maximum number of PseudoWire interfaces supported in the system is 100. This interface type is not supported.</li><li>– <b>ac</b> - Attachment Circuit (AC) is a physical or virtual circuit attaching a Customer Edge to a Provider Edge port. This value ranges between 1 and 65535. This interface type is not supported.</li></ul></li><li>• <b>&lt;interface-id&gt;</b> - Displays GVRP statistics for the interface id of the specified type of interface. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show gvrp statistics port gi 0/1 GVRP Statistics for Port 1 ----- Total valid GVRP Packets Received:  0 Join Emptys                        0 Join In                             0 Leave In                             0 Leave All                            0</pre>

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```
Leave Empty          0
Empty               0
Total valid GVRP Packets Transmitted: 0
Join Emptys        0
Join In            0
Leave In            0
Leave All           0
Leave Empty         0
Empty              0
```

---

**Related Command(s)**

- **set gvrp** – Globally enables or disables GVRP feature on all ports of a switch
  - **set port gvrp** - Enables or disables GVRP feature on the specified interface
-

## Chapter 20

### VRRP

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VRRP (Virtual Router Redundancy Protocol) is an election protocol that dynamically assigns responsibility for one or more virtual router(s) to the VRRP routers(s) on a LAN, allowing several routers on a multi-access link to utilize the same virtual IP address. A VRRP router is configured to run the VRRP protocol in conjunction with one or more other routers attached to a LAN. In a VRRP setup, one router is elected as the master router with the other routers acting as backups in case of the failure of the master router. VRRP is designed to eliminate the single point of failure inherent in the static default routed environment

The list of CLI commands for the configuration of VRRP is as follows:

- [router vrrp](#)
- [interface – VRRP](#)
- [vrrp - ipv4 address](#)
- [vrrp – ip address](#)
- [vrrp group shutdown](#)
- [vrrp – priority](#)
- [vrrp – preempt](#)
- [vrrp - text-authentication](#)
- [vrrp - authentication text](#)
- [vrrp – interval](#)
- [vrrp - timers advertise](#)
- [show vrrp](#)
- [show vrrp interface](#)
- [auth-deprecate](#)

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- [debug ip vrrp](#)



## 20.1 router vrrp

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**Command Objective** This command enables VRRP globally in the router and enters into the VRRP Router Configuration Mode, which allows the user to execute all the commands which supports this mode.

The no form of the command disables VRRP in the router.

---

**Syntax** `router vrrp`  
`no router vrrp`

---

**Mode** Global Configuration Mode

---

**Example** `Your Product(config)# router vrrp`  
`Your Product (config-vrrp)#`

---

**Related Command(s)**

- `interface - VRRP` - Enables VRRP in the specified interface.
- `vrrp -ipv4 address` - Sets the associated IP addresses for the virtual router.
- `show vrrp interface - vrid` - Displays the VRRP status information.
- `vrrp group shutdown` - Shuts down all VRRP groups.

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## 20.2 interface – VRRP

**Command Objective** This command enables VRRP for the specified interface and enters into the VRRP Interface Configuration Mode, which allows the user to execute all the commands which supports this mode.




The no form disables VRRP for the specified interface.

**Syntax**


```
interface { vlan <vlan-id/vfi-id> | <interface-type>
<interface-id> | <IP-interface-type> <IP-interface-number>}

no interface { Vlan <vlan-id/vfi-id> | <interface-type>
<interface-id> | <IP-interface-type> <IP-interface-number>}
```

**Parameter Description**

- **vlan <vlan-id/vfi-id>** - Enables VRRP for the specified VLAN / VFI ID. This value ranges between 1 and 65535.
  - **<vlan -id>** - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094
  - **<vfi-id>** - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported.
    -  The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.
    -  VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW.
    -  The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.
- **<interface-type>** - Enables VRRP for the specified type of interface. The interface can be:
  - qx-ethernet – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.
  - gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
  - extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.

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- **<interface-id>** - Enables VRRP for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, For example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided, for interface type port-channel. For example: 1 represents port-channel ID.
- **<IP-interface-type>** - Enables VRRP in the specified L3 Psuedo wire interface in the system.
- **<IP-interface-number>** - Enables VRRP for the specified interface identifier. This is a unique value that represents the specific interface . This value ranges between 1 and 65535 for Psuedowire interface.  
 Maximum number of PseudoWire interfaces supported in the system is 100.

---

**Mode** VRRP Router Configuration Mode

---

**Example**

```
Your Product(config-vrrp)# interface vlan 3
Your Product(config-vrrp-if)#
Your Product (config-vrrp)# interface gigabitethernet 0/1
Your Product (config-vrrp-if)#
```

---

**Related Command(s)**

- **router vrrp** – Enables VRRP in the router.
- **show vrrp interface - vrid** – Displays the VRRP status information.
- **show vrrp interface** - Displays the VRRP status information for all VR-ids created on that interface.

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## 20.3 vrrp - ipv4 address

**Command Objective** This command sets the associated IP addresses for the virtual router. On executing this command the VRRP module starts the transition from 'Initial' state to either 'Backup' state or 'Master' state as per the election process on the specific interface.

The no form of the command deletes the associated IP addresses for the virtual router.

**Syntax**

```
vrrp <vrid(1-255)> ipv4 <ip_addr > [secondary]
```

```
no vrrp <vrid(1-255)> ipv4[<ip_addr>[secondary]]
```

**Parameter Description**

- **<vrid(1-255)>** - Configures virtual router identifier(VRID)which is a number along with an interface to uniquely identify a virtual router on a given VRRP router. This value ranges between 1 and 255.
- **ipv4 <ip\_addr >** - Configures an IPv4 address to be assigned to the VRID.
- **secondary** - Configures the secondary IP address for the specified virtual router.

**Mode** VRRP Interface Configuration Mode



This command executes only if the associated primary IP address for the virtual router is set.

**Example** `Your Product(config-vrrp-if)# vrrp 3 ipv4 10.0.0.1`

**Related Command(s)**

- `router vrrp` – Enables VRRP in the router.
- `ip address` - Sets an IP address for an interface.
- `vrrp - preempt` - Enables the pre-emption of state change from either Backup to Master or vice versa based on the election process.
- `vrrp - text-authentication / vrrp - authentication text` - Sets the authentication type for the virtual router to simple password.
- `vrrp - interval / vrrp - timers advertise` - Sets the advertisement timer for a virtual router.
- `show vrrp interface - vrid` – Displays the VRRP status information.
- `show vrrp interface` - Displays the VRRP status information.

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## 20.4 vrrp – ip address

**Command Objective** This command sets the associated IP addresses for the virtual router. On executing this command the VRRP module starts the transition from 'Initial' state to either 'Backup' state or 'Master' state as per the election process on the specific interface.



This command is a complete standardized implementation of the existing command and operates similar to that of the command `vrrp - ipv4 address`.

**Syntax** `vrrp <vrid(1-255)> ip <ip_addr> [secondary]`

**Parameter Description**

- `<vrid(1-255)>` - Configures virtual router identifier (VRID) which is a number along with an interface to uniquely identify a virtual router on a given VRRP router. This value ranges between 1 and 255.
- `ip <ip_addr >` - Configures a IPv4 addresses to be assigned to the VRID.
- `secondary` - Configures the secondary IP addresses for the specified virtual router.

**Mode** VRRP Interface Configuration Mode



This command executes only if the associated primary IP addresses for the virtual router is set.

**Example** `Your product(config-vrrp-if)# vrrp 3 ip 10.0.0.1`

**Related Command(s)**

- `router vrrp` - Enables VRRP in the router.
- `ip address` - Sets an IP address for an interface.
- `vrrp - preempt` - Enables the pre-emption of state change from either Backup to Master or vice versa based on the election process.
- `vrrp - text-authentication / vrrp - authentication text` - Sets the authentication type for the virtual router to simple password.
- `vrrp - interval / vrrp - timers advertise` - Sets the advertisement timer for a virtual router.
- `show vrrp interface - vrid` - Displays the VRRP status information.
- `show vrrp interface` - Displays the VRRP status information.

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## 20.5 vrrp group shutdown

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**Command Objective** This command shuts down all VRRP groups.



This command is a complete standardized implementation of the existing command and operates similar to that of the command `vrrp - ipv4 address`, except that all the associated IP address of the virtual router will be deleted.

---

**Syntax** `vrrp group shutdown`

---

**Mode** VRRP Interface Configuration Mode



This command executes only if the associated primary IP addresses for the virtual router is set.

---


**Example** `Your Product(config-vrrp-if)# vrrp group shutdown`

---

**Related Command(s)**

- `router vrrp` - Enables VRRP in the router.
  - `show vrrp interface - vrid` - Displays the VRRP status information.
  - `show vrrp interface` - Displays the VRRP status information.
-



## 20.6 vrrp – priority

<b>Command Objective</b>	<p>This command sets the priority for the virtual router.</p> <p>The no form of the command sets the priority for the virtual router to its default value.</p>
<b>Syntax</b>	<pre>vrrp &lt;vrid(1-255)&gt; priority &lt;priority(1-254)&gt;</pre> <pre>no vrrp &lt;vrid(1-255)&gt; priority</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;vrid(1-255)&gt;</b> - Configures a virtual router ID for which the priority is to be set. This value ranges between 1 and 255.</li><li>• <b>&lt;priority(1-254)&gt;</b> - Sets the priority which is used for the virtual router master election process. Higher values implies higher priority. A priority of 255 is used for the router that owns the associated IP address(es).</li></ul>
<b>Mode</b>	VRRP Interface Configuration Mode
	This command executes only if the associated primary IP addresses for the virtual router is set.
<b>Default</b>	priority -100
<b>Example</b>	<pre>Your Product(config-vrrp-if)# vrrp 3 priority 7</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>ip address</b> - Configures IP address for an interface.</li><li>• <b>router vrrp</b> - Enables VRRP in the router.</li><li>• <b>interface - VRRP</b> - Enables VRRP in the specified interface.</li><li>• <b>vrrp - ipv4 address</b> - Sets the associated primary IP addresses for the virtual router.</li><li>• <b>show vrrp interface - vrid</b> - Displays the VRRP status information.</li></ul>

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## 20.7 vrrp – preempt

<b>Command Objective</b>	<p>This command enables the pre-emption of state change from either Backup to Master or vice versa based on the election process.</p> <p>The no form of the command disables the preempt mode.</p>
<b>Syntax</b>	<pre>vrrp &lt;vrid(1-255)&gt; preempt [delay minimum &lt;value(0-30)&gt;]  no vrrp &lt;vrid(1-255)&gt; preempt</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>vrid&lt;vrid(1-255)&gt;</b> - Configures a virtual router ID for which the preempt state change is to be enabled. The value ranges between 1 and 255.</li><li>• <b>delay minimum &lt;value(0-30)</b> - Sets the number of seconds that the router will delay before issuing an advertisement claiming master ownership. This value ranges between 0 and 30.</li></ul> <p> This feature has been included to adhere to the Industry Standard CLI syntax. This feature is currently not supported.</p>
<b>Mode</b>	VRRP Interface Configuration Mode
<b>Default</b>	<ul style="list-style-type: none"><li>• delay minimum - 0</li><li>• Pre-emption is enabled.</li></ul>
	This command executes only if the associated primary IP addresses for the virtual router is set.
<b>Example</b>	<pre>Your product(config-vrrp-if)# vrrp 3 preempt</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>ip address</b> - Configures IP address for an interface.</li><li>• <b>router vrrp</b> - Enables VRRP in the router</li><li>• <b>interface - vrrp</b> - Enables VRRP in the specified interface.</li><li>• <b>vrrp - ipv4 address</b> - Sets the associated primary IP addresses for the virtual router</li><li>• <b>show vrrp interface - vrid</b> - Displays the VRRP status information</li><li>• <b>show vrrp interface</b> - Displays the VRRP status information</li></ul>





## 20.8 vrrp - text-authentication

<b>Command Objective</b>	<p>This command sets the authentication type for the virtual router to simple password.</p> <p>The no form of the command sets the authentication type for the virtual router to none</p>
<b>Syntax</b>	<pre>vrrp &lt;vrid(1-255)&gt; text-authentication &lt;password&gt;</pre> <pre>no vrrp &lt;vrid(1-255)&gt; text-authentication</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>vrrp &lt;vrid(1-255)&gt;</b> - Configures a virtual router ID for which the authentication type is to be set. This value ranges between 1 and 255.</li><li>• <b>&lt;password&gt;</b> - Sets the authentication password which is used to validate the incoming VRRP packets. The maximum value of this string is 8.</li></ul>
<b>Mode</b>	VRRP Interface Configuration Mode
	<p>This command executes only if</p> <ul style="list-style-type: none"><li>• The associated IP addresses for the virtual router is set</li><li>• Auth deprecate is disabled.</li></ul>
<b>Example</b>	<pre>Your Product(config-vrrp-if)# vrrp 3 text-authentication pwd</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>ip address</b> - Configures IP address for an interface.</li><li>• <b>router vrrp</b> - Enables VRRP in the router.</li><li>• <b>interface - VRRP</b> - Enables VRRP in the specified interface.</li><li>• <b>vrrp - ipv4 address</b> - Sets the associated IP addresses for the virtual router.</li><li>• <b>auth-deprecate</b> - Disables the auth deprecate.</li><li>• <b>show vrrp interface - vrid</b> - Displays the VRRP status information.</li></ul>

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## 20.9 vrrp - authentication text

<b>Command Objective</b>	This command sets the authentication type for the virtual router to simple password.
	<p>This command is a complete standardized implementation of the existing command and operates similar to that of the command <code>vrrp - text-authentication</code>.</p> <p>This feature has been included in adherence to the Industry Standard CLI syntax</p>
<b>Syntax</b>	<code>vrrp &lt;vrid(1-255)&gt; authentication text &lt;password&gt;</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>vrrp &lt;vrid(1-255)&gt;</code> - Configures a virtual router ID for which the authentication type is to be set. This value ranges between 1 and 255.</li><li>• <code>&lt;password&gt;</code> - Sets the authentication password which is used to validate the incoming VRRP packets. The maximum value of this string is 8.</li></ul>
<b>Mode</b>	VRRP Interface Configuration Mode
	<p>This command executes only if</p> <ul style="list-style-type: none"><li>• associated IP addresses for the virtual router is set.</li><li>• Auth depreciate is disabled.</li></ul>
<b>Example</b>	<pre>Your Product(config-vrrp-if)# vrrp 3 authentication text abcdefgh</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip address</code> - Configures IP address for an interface.</li><li>• <code>router vrrp</code> - Enables VRRP in the router.</li><li>• <code>interface - VRRP</code> - Enables VRRP in the specified interface.</li><li>• <code>vrrp - ipv4 address</code> - Sets the associated IP addresses for the virtual router.</li><li>• <code>auth-depreciate</code> - Disables the auth depreciate.</li><li>• <code>show vrrp interface - vrid</code> - Displays the VRRP status information.</li></ul>




---

## 20.10 vrrp – interval




<b>Command Objective</b>	<p>This command sets the advertisement timer for a virtual router and sends only the master router advertisements.</p> <p>The no form of the command sets the advertisement timer for a virtual router to default value.</p>
<b>Syntax</b>	<pre>vrrp &lt;vrid(1-255)&gt; timer [msec] &lt;interval(1-255)secs&gt;</pre> <pre>no vrrp &lt;vrid(1-255)&gt; timer</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>vrrp &lt;vrid(1-255)&gt;</b> - Configures the Virtual Router ID for which the advertisement timer is to be set. This value ranges between 1 and 255.</li> <li>• <b>msec</b> - Sets the of advertisement time in milliseconds. <ul style="list-style-type: none"> <li> This feature has been included to adhere to the Industry Standard CLI syntax. This feature is currently not supported.</li> </ul> </li> <li>• <b>timer &lt;interval(1-255)secs&gt;</b> - Configures the time interval between successive advertisement messages in seconds. On expiry of the advertise timer, the Master sends advertisement packets to the Backup. This value ranges between 1 and 255 in seconds.</li> </ul>
<b>Mode</b>	VRRP Interface Configuration Mode
<b>Default</b>	1 second
	This command executes only if the associated primary IP addresses for the virtual router is set.
<b>Example</b>	<b>Your product(config-vrrp-if)# vrrp 4 timer 6</b>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li>• <b>ip address</b> - Configures IP address for an interface.</li> <li>• <b>router vrrp</b> - Enables VRRP in the router</li> <li>• <b>interface - VRRP</b> - Enables VRRP in the specified interface.</li> <li>• <b>vrrp - ipv4 address</b> - Sets the associated primary IP addresses for the virtual router</li> <li>• <b>show vrrp interface - vrid</b> - Displays the VRRP status information</li> </ul>

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## 20.11 vrrp - timers advertise


<b>Command Objective</b>	This command sets the advertisement timer for a virtual router and sends only the master router advertisements.
	<p>This command is a complete standardized implementation of the existing command and operates similar to that of the command <code>vrrp - interval</code></p> <p>This feature has been included in adherence to the Industry Standard CLI syntax.</p>
<b>Syntax</b>	<code>vrrp &lt;vrid(1-255)&gt; timers advertise [msec] &lt;interval(1-255)secs&gt;</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>vrrp &lt;vrid(1-255)&gt;</code> - Configures the Virtual Router ID for which the</li><li>• <code>msec</code> - Sets the of advertisement time in milliseconds.  This feature has been included to adhere to the Industry Standard CLI syntax. This feature is currently not supported.</li><li>• <code>&lt;interval(1-255)secs&gt;</code> - Configures the time interval between successive advertisement messages in seconds. On expiry of the advertise timer, the Master sends advertisement packets to the Backup. This value ranges between 1 and 255 in seconds.</li></ul>
<b>Mode</b>	VRRP Interface Configuration Mode
<b>Default</b>	1 second
	This command executes only if the associated IP addresses for the virtual router is set
<b>Example</b>	<code>Your product(config-vrrp-if)# vrrp 3 timers advertise 100</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip address</code> - Configures IP address for an interface.</li><li>• <code>router vrrp</code> - Enables VRRP in the router.</li><li>• <code>interface - VRRP</code> - Enables VRRP in the specified interface.</li><li>• <code>vrrp - ipv4 address</code> - Sets the associated IP addresses for the virtual router.</li><li>• <code>show vrrp interface - vrid</code> - Displays the VRRP status information.</li></ul>

## 20.12 show vrrp

<b>Command Objective</b>	This command displays the VRRP status information. for the specified VR ID .
<b>Syntax</b>	<pre>show vrrp [interface { vlan &lt;VlanId/vfi-id&gt;   &lt;interface-type&gt; &lt;interface-id&gt;   &lt;IP-interface-type&gt; &lt;IP-interface-number&gt; } &lt;VrId(1-255)&gt;] [{brief detail  statistics}]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>vlan &lt;VlanId/vfi-id&gt;</b>- Displays the VRRP status information for the specified VLAN/ VFI ID. This value ranges between 1 and 65535. <ul style="list-style-type: none"> <li>– <b>&lt;vlan -id&gt;</b> - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094</li> <li>– <b>&lt;vfi-id&gt;</b>. - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported. <ul style="list-style-type: none"> <li> The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.</li> <li> VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW .</li> <li> The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.</li> </ul> </li> </ul> </li> <li>• <b>&lt;interface-type&gt;</b> - Displays the VRRP status information for the specified type of interface. The interface can be: <ul style="list-style-type: none"> <li>– qx-ethernet – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>– gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.</li> <li>– extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.</li> </ul> </li> <li>• <b>&lt;interface-id&gt;</b> - Displays the VRRP status information for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. For example: 0/1 represents that the slot number is 0 and port number is 1.</li> </ul>

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---

- **<IP-interface-type>** - Displays VRRP related configuration for the specified L3 Psuedo wire interface in the system.
- **<IP-interface-number>** - Displays VRRP related configuration for the specified interface identifier. This is a unique value that represents the specific interface . This value ranges between 1 and 65535 for Psuedowire interface. This interface is not supported.
  -  Maximum number of PseudoWire interfaces supported in the system is 100.
- **<VrId(1-255)>** - Displays the VRID which is a number along with an interface to uniquely identify a virtual router on a given VRRP router.
- **brief** - Displays the brief VRRP status information.
- **detail** - Displays the detailed VRRP status information.
- **statistics** - Displays the statistical information for the VRRP.

---

<b>Mode</b>	Privileged EXEC Mode
-------------	----------------------

---

**Example**

```
Your Product# show vrrp interface vlan 2 detail
vlan2 - vrID 1
-----
State is Master
Virtual IP address is 12.0.0.2
Virtual MAC address is 00:00:5e:00:01:01
Master router is 12.0.0.2
Associated IpAddresses :
-----
12.0.0.2
Advertise time is 1 secs
Current priority is 100
Configured priority is 100, may preempt
vlan2 - vrID 2
-----
State is Master
Virtual IP address is 12.0.0.1
Virtual MAC address is 00:00:5e:00:01:02
Master router is 12.0.0.1
Associated IpAddresses :
```

---

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```
-----  
12.0.0.1
```

```
Advertise time is 1 secs
```

```
Current priority is 255
```

```
Configured priority is 255, may preempt
```

```
Your Product# show vrrp interface vlan 2 brief
```

```
P indicates configured to preempt
```

Interface	vrID	Priority	P	State	Master Addr	VRouter Addr
-----	----	-----	-	-----	-----	-----
vlan2	1	100	P	Master	local	12.0.0.2
vlan2	2	255	P	Master	local	12.0.0.1

```
Your Product# show vrrp interface vlan 2 statistics
```

```
vlan2 - vrID 1
```

```
-----  
Transitions to Master : 2
```

```
Advertisements Received : 0
```

```
Advertise Internal Errors : 0
```

```
Authentication Failures : 0
```

```
TTL Errors : 0
```

```
Zero Priority Packets Received : 1
```

```
Zero Priority Packets Sent : 0
```

```
Invalid Type Packets Received : 0
```

```
Address List Errors : 0
```

```
Invalid Authentication Type : 0
```

```
Authentication Type Mismatch : 0
```

```
Packet Length Errors : 0
```

```
vlan2 - vrID 2
```

```
-----  
Transitions to Master : 1
```

```
Advertisements Received : 0
```

```
Advertise Internal Errors : 0
```

```
Authentication Failures : 0
```

```
TTL Errors : 0
```

```
Zero Priority Packets Received : 0
```

```
Zero Priority Packets Sent : 0
```

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---

```
Invalid Type Packets Received : 0
Address List Errors           : 0
Invalid Authentication Type   : 0
Authentication Type Mismatch : 0
Packet Length Errors          : 0
```

Your Product# **show vrrp interface vlan 2**

P indicates configured to preempt

Interface	vrID	Priority	P	State	Master Addr	VRouter Addr
vlan2	1	100	P	Master	local	12.0.0.2
vlan2	2	255	P	Master	local	12.0.0.1




---

## Related Command(s)

- **router vrrp** - Enables VRRP in the router.
  - **interface** - Selects an interface to be configured.
  - **vrrp - ipv4 address / vrrp - ip address** - Sets the IP address for the virtual router.
  - **vrrp group shutdown** - Shuts down all VRRP groups.
  - **vrrp - preempt** - Enables the pre-emption of state change from either Backup to Master or vice versa based on the election process.
  - **vrrp - text-authentication / vrrp - authentication text** - Sets the authentication type for the virtual router to simple password.
  - **vrrp - interval / vrrp - timers advertise** - Sets the advertisement timer for a virtual router.
-




## 20.13 show vrrp interface

<b>Command Objective</b>	This command displays the VRRP status information for all VR-ids created on that interface.
<b>Syntax</b>	<code>show vrrp interface [{ vlan &lt;vlan-id/vfi-id&gt;   &lt;interface-type&gt; &lt;interface-id&gt;   &lt;IP-interface-type&gt; &lt;IP-interface-number&gt;}] [{brief detail  statistics}]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>vlan &lt;vlan-id/vfi-id&gt;</b> - Displays the VRRP status information for the specified VLAN/ VFI ID. This value ranges between 1 and 65535.             <ul style="list-style-type: none"> <li>– <b>&lt;vlan -id&gt;</b> - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094</li> <li>– <b>&lt;vfi-id&gt;</b> - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported.                 <ul style="list-style-type: none"> <li> The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.</li> <li> VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW.</li> <li> The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.</li> </ul> </li> </ul> </li> <li>• <b>&lt;interface-type&gt;</b> - Displays the VRRP status information for the specified type of interface. The interface can be:             <ul style="list-style-type: none"> <li>– <b>qx-ethernet</b> –A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>– <b>gigabitethernet</b> – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.</li> <li>– <b>extreme-ethernet</b> – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.</li> </ul> </li> <li>• <b>&lt;interface-id&gt;</b> - Displays the VRRP status information for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. For example: 0/1 represents that the slot number is 0 and port number is 1.</li> </ul>

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- **<IP-interface-type>** - Displays VRRP related configuration for the specified L3 Psuedo wire interface in the system.
- **<IP-interface-number>** - Displays VRRP related configuration for the specified interface identifier. This is a unique value that represents the specific interface . This value ranges between 1 and 65535 for Psuedowire interface. This interface type is not supported.
  -  Maximum number of PseudoWire interfaces supported in the system is 100.
- **brief** - Displays the brief VRRP status information for the specified interface.
- **detail** - Displays the detailed VRRP status information for the specified interface.
- **statistics** - Displays the statistical information for the VRRP for the specified interface.

---

**Mode** Privileged EXEC Mode

---

**Example** Your Product# show vrrp interface

```
P indicates configured to preempt
Interface  vrID Priority P  State  Master Addr  VRouter Addr
-----  -  -  -  -  -  -  -
Slot0/1    1    100   P  Master   local        21.0.0.1
```

- 
- Related Command(s)**
- **router vrrp** - Enables VRRP in the router.
  - **interface** - Selects an interface to configure.
  - **vrrp - ipv4 address / vrrp - ip address** - Sets the IP address for the virtual router.
  - **vrrp group shutdown** - Shuts down all VRRP groups.
  - **vrrp - preempt** - Enables the pre-emption of state change from either Backup to Master or vice versa based on the election process.
-

## 20.14 auth-deprecate

<b>Command Objective</b>	This command enables or disables the Auth Deprecation flag.
<b>Syntax</b>	<code>auth-deprecate { enable   disable }</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>enable</code> - Enables the AuthDeprecation flag.</li><li>• <code>disable</code> - Disables the AuthDeprecation flag.</li></ul>
<b>Default</b>	enable
<b>Mode</b>	VRRP Router Configuration Mode
<b>Example</b>	Your product(config-vrrp)# <code>auth-deprecate enable</code>

---

# Supermicro Switch Configuration CLI Guide

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## 20.15 debug ip vrrp

<b>Command Objective</b>	<p>This command enables the tracing of the VRRP module as per the configured debug levels. The trace statements are generated for the configured trace levels.</p> <p>This command does not allow combination of debug levels to be configured (that is, more than one level of trace cannot be enabled or disabled). The debug levels are configured one after the other and not in single execution of the command.</p> <p>The no form of this command disables the tracing of the VRRP module as per the configured debug levels. The trace statements are not generated for the configured trace levels.</p>
<b>Syntax</b>	<pre>debug ip vrrp { all   init   pkt   timers   events   failures }  no debug ip vrrp { all   init   pkt   timers   events   failures }</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>all</b> - Generates debug statements for all kinds of traces.</li><li>• <b>init</b> - Generates debug statements for init and shutdown traces. This trace is generated on failed and successful initialization and shutting down of VRRP related module and memory.</li><li>• <b>pkt</b> - Generates debug statements for packet dump traces. This trace is generated for all events generated during processing of packets.</li><li>• <b>timers</b> - Generates debug statements for timer traces.</li><li>• <b>events</b> - Generates debug statements for event traces. This trace is generated when any of packets are sent successfully or when an ACK is received.</li><li>• <b>failures</b> - Generates debug statements for all kind of failure traces.</li></ul>
<b>Mode</b>	User Exec Mode / Privileged EXEC Mode
<b>Example</b>	Your product # debug ip vrrp all

---

## Chapter 21

### IP

---

IP (Internet Protocol) is an identifier for a computer or device on a TCP/IP network. Networks using the TCP/IP protocol route messages based on the IP address of the destination. The format of an IP address is a 32-bit numeric address written as four numbers separated by periods. Each number can be zero to 255. example: 10.5.25.180.

Every computer that communicates over the Internet is assigned an IP address that uniquely identifies the device and distinguishes it from other computers on the Internet. Within an isolated network, IP addresses can be assigned at random as long as each one is unique. However, to connect a private network to the Internet, the registered IP addresses must be used (called Internet addresses) to avoid duplicates. The four numbers in an IP address are used in different ways to identify a particular network and a host on that network.

Four regional Internet registries -- ARIN, RIPE NCC, LACNIC and APNIC -- assign Internet addresses from the following three classes.

- Class A - supports 16 million hosts on each of 126 networks
- Class B - supports 65,000 hosts on each of 16,000 networks
- Class C - supports 254 hosts on each of 2 million networks

The number of unassigned Internet addresses is running out, so a new classless scheme called CIDR (Classless Inter-Domain Routing) is gradually replacing the system based on classes A, B, and C and is tied to adoption of IPv6.

ICMP (Internet Control Message Protocol) is an extension to the IP defined by RFC 792. ICMP supports packets containing error, control, and informational messages. For example the ping command uses ICMP to test an Internet connection.

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The IP commands under this section are therefore classified into:

- [Specific to SMIS IP](#)
- [Common to SMIS and Linux IP](#)

## 21.1 Commands Specific for SMIS IP

This section describes the commands that are specific for SMIS IP alone. These commands are based on the SMIS Proprietary MIB.

The list of CLI commands for the configuration of SMIS IP is as follows:

- [ip redirects](#)
- [ip unreachable](#)
- [ip mask-reply](#)
- [ip echo-reply](#)
- [maximum-paths](#)
- [ip rarp client request](#)
- [ip aggregate-route](#)
- [traffic-share](#)
- [ip path mtu discover](#)
- [ip path mtu](#)
- [ip rarp client](#)
- [ip directed-broadcast](#)
- [show ip rarp](#)
- [show ip pmtu](#)

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## 21.1.1 ip redirects

**Command Objective** This command enables sending ICMP Redirect messages. The Redirect Message is an ICMP message which informs a host to update its routing information to send packets on an alternate route when a packet enters an IP interface and exits the same interface. The redirect message is sent to inform the host of the presence of alternative route.

The no form of this command disables sending ICMP Redirect messages.

**Syntax**

```
ip redirects [vrf <vrf-name>]
no ip redirects [vrf <vrf-name>]
```

**Parameter Description**

- **vrf <vrf-name>** - Sends the ICMP redirect messages for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.

**Mode** Global Configuration Mode

**Default** Sending of ICMP Redirect messages is enabled



VRF instance should be created, before executing this command to configure ICMP redirect messages for the context.

**Example** `Your Product(config)# ip redirects`

**Related Command(s)**

- `ip vrf` - Creates VRF instance
- `show ip information --` Displays IP configuration information



## 21.1.2 ip unreachablees

**Command Objective** This command enables the router to send an ICMP unreachable message to the source if the router receives a packet that has an unrecognized protocol or no route to the destination address. ICMP provides a mechanism that enables a router or destination host to report an error in data traffic processing to the original source of the packet. This informs the source that the packet is dropped.

The no form of this command disables sending ICMP unreachable messages.

**Syntax**

```
ip unreachablees [vrf <vrf-name>]
no ip unreachablees [vrf <vrf-name>]
```

**Parameter Description**

- **vrf <vrf-name>** - Sends an ICMP unreachable message for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.

**Mode** Global Configuration Mode

**Package** Workgroup, Enterprise, Metro\_E and Metro



VRF instance should be created, before executing this command to configure the ICMP unreachable message for the context

**Example** `Your Product(config)# ip unreachablees`

**Related Command(s)**

- `ip vrf` - Creates VRF instance
- `show ip information --` Displays IP configuration information

# Supermicro Switch Configuration CLI Guide

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## 21.1.3 ip mask-reply

**Command Objective** This command enables sending ICMP Mask Reply messages. The IP mask reply is an ICMP message sent by the router to the host informing the subnet mask of the network. This reply is in correspondence to a request sent by the host seeking the subnet mask of the network.

The no form of this command disables sending ICMP Mask Reply messages.

**Syntax**  
`ip mask-reply [vrf <vrf-name>]`  
`no ip mask-reply [vrf <vrf-name>]`

**Parameter Description**

- `vrf<vrf-name>` - Sends ICMP mask reply messages for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.

**Mode** Global Configuration Mode

**Default** Sending of ICMP Mask Reply messages is enabled



VRF instance should be created, before executing this command to configure the ICMP mask reply messages for the context.

**Example** `Your Product(config)# ip mask-reply`

**Related Command(s)**

- `ip vrf` - Creates VRF instance
- `show ip information --` Displays IP configuration information

## 21.1.4 ip echo-reply

**Command Objective** This command enables sending ICMP Echo Reply messages. The ip echo reply is a message sent by a device, in response to a request sent by another device. This message is used to check if device is able to communicate (send and receive data) with the destination device.

The no form of this command disables sending ICMP Echo Reply messages.

**Syntax**

```
ip echo-reply [vrf <vrf-name>]
no ip echo-reply [vrf <vrf-name>]
```

**Parameter Description**

- vrf<vrf-name>** - Sends an ICMP Echo reply messages for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.

**Mode** Global Configuration Mode

**Default** Sending of ICMP Echo Reply messages is enabled



VRF instance should be created, before executing this command to configure the ICMP echo reply messages for the context.

**Example** `Your Product(config)# ip echo-reply`

**Related Command(s)**

- `ip vrf` - Creates VRF instance
- `show ip information --` Displays IP configuration information

# Supermicro Switch Configuration CLI Guide

---

## 21.1.5 maximum-paths

**Command Objective** This command sets the maximum number of paths that can be connected to a host. It provides multiple forwarding paths for data traffic and enables load balancing. It improves the overall network fault tolerance, as failure in one instance does not affect the other instances.

The no form of this command sets the maximum number of paths to its default value.



This command is currently not supported on some models.

**Syntax**

```
maximum-paths [vrf <vrf-name>] <value (1-16)>
no maximum-paths [vrf <vrf-name>]
```

**Parameter Description**

- **vrf<vrf-name>** - Sets the maximum number of paths for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.

**Mode** Global Configuration Mode

**Default** Maximum number of multipaths is set as 2



VRF instance should be created, before executing this command to configure the maximum number of multipaths for the context.

**Example** Your Product(config)# maximum-paths 15

**Related Command(s)**

- **ip vrf** - Creates VRF instance
- **show ip information** — Displays IP configuration information

## 21.1.6 ip rarp client request

<b>Command Objective</b>	<p>This command sets the number of RARP client request retries or interval between requests. The ip rarp client request is sent from a newly set up machine in a network. The RARP client program requests the RARP server in the Router to send its IP address. The network administrator creates a table in the lan's gateway router. The router maps the MAC address of the client to an IP address that is sent to the client for future use. If the server didn't respond with an ip address, the client retries the request for configured number of times and the interval between each retry can also be set.</p> <p>The no form of this command sets the RARP client request retries or interval between retries to the default values.</p> <p>RARP requests are most commonly sent by diskless clients and JumpStart clients during bootup. The client uses the RARP protocol to broadcast the Ethernet address and asks for the corresponding IP address.</p>
<b>Syntax</b>	<pre>ip rarp client request {interval &lt;timeout (30-3000)&gt;   retries &lt;retries (2-10)&gt;}  no ip rarp client request { interval retries }</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li><b>interval &lt;timeout (30-3000)&gt;</b> - Configures the interval (in seconds) after which an unanswered RARP request is transmitted. The value ranges between 30 and 3000.</li> <li><b>retries &lt;retries (2-10)&gt;</b> - Sets the maximum number of retransmissions of RARP request packet after which request must not be sent. The value ranges between 2 and 10.</li> </ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	<ul style="list-style-type: none"> <li>interval 100</li> <li>retries 4</li> </ul>
<b>Example</b>	Your Product(config)# ip rarp client request interval 30
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><b>show ip rarp</b> - Displays RARP configuration information</li> </ul>

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---

## 21.1.7 ip aggregate-route

---

<b>Command Objective</b>	<p>This command sets the maximum number of aggregate routes. Aggregate Route-based IP switching is achieved by creating a virtual circuit along the network by selecting the forwarding paths used by routers that use OSPF and BGP(Border Gateway Protocol).The data is sent through these virtual circuit to the destination. The routing process is skipped along this circuit. The data is tagged with a label that is read by the switches and forwarded to the destination. This value ranges between 5 and 4095.</p> <p>The no form of this command sets the maximum number of aggregate routes to its default value.</p>
<b>Syntax</b>	<pre>ip aggregate-route &lt;value (5-4095)&gt; no ip aggregate-route</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	10
<b>Example</b>	<pre>Your Product(config)# ip aggregate-route 500</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip information</code> -- Displays IP configuration information</li></ul>

---

## 21.1.8 traffic-share

**Command Objective** This command enables traffic sharing (load sharing of IP packets). Traffic sharing is the process by which the protocols select the route for traffic flow with regard to path cost calculation and load distribution. EIGRP (Enhanced Interior Gateway Routing Protocol) provides intelligent traffic sharing. Traffic sharing is controlled by selecting the Mode of distribution. Traffic-share balanced distributes the traffic proportionately to the ratio of the metrics of different routes. The Traffic-share min distributes the traffic in the route which has minimal cost path even if different paths are available.

The no form of this command disables traffic sharing.



This command is currently not supported on some models.

### Syntax

```
traffic-share [vrf <vrf-name>]
```

```
no traffic-share [vrf <vrf-name>]
```

### Parameter Description

- **vrf<vrf-name>** - Enables traffic sharing for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.

### Mode

Global Configuration Mode

### Default

Load Sharing is disabled



VRF instance should be created, before executing this command to configure the traffic sharing for the context.

### Example

```
Your Product(config)# traffic-share
```

### Related Command(s)

- **ip vrf** - Creates VRF instance
- **show ip information --** Displays IP configuration information

# Supermicro Switch Configuration CLI Guide

---

## 21.1.9 ip path mtu discover

---

**Command Objective** This command initiates path MTU (Maximum Transmission Unit) discovery.

The no form of this command sets path MTU discovery to its default value. When IP path MTU discover is set to be disabled, PMTU-D is not done even if the application requests to do so.

---

**Syntax**

```
ip [vrf <vrf-name>] path mtu discover
```

```
no ip [vrf <vrf-name>] path mtu discover
```

---

**Parameter Description**

- **vrf<vrf-name>** - Initiates path MTU for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.

---

**Mode** Global Configuration Mode

---

**Default** Path MTU discovery is disabled



VRF instance should be created, before executing this command to configure the path MTU discovery for the context.

---

**Example** `Your Product(config)# ip path mtu discover`

---

**Related Command(s)**

- `ip path mtu` - Sets the MTU for usage in PMTU Discovery
- `ip vrf` - Creates VRF instance
- `show ip information --` Displays IP configuration information

---



## 21.1.10 ip path mtu

**Command Objective** This command sets the MTU for usage in PMTU discovery. The transmission of packets from source to destination has many networks to pass through. Each network has its own Maximum transmission unit. The smallest MTU of all the links is the path MTU. This PMTU can be manually configured by the administrator.

The no form of this command removes MTU for usage in PMTU Discovery.

**Syntax** `ip path mtu [vrf <vrf-name>] <dest ip> <tos> <mtu(68-65535)>`

`no ip path mtu [vrf <vrf-name>] <dest ip> <tos>`

- Parameter Description**
- `vrf<vrf-name>` - Sets the MTU for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.
  - `dest ip` - Sets the Destination IP Address. This is done to define the path between source and destination.
  - `tos` - Sets the Type of Service of the configured route
  - `mtu` - Sets the Maximum Transmission Unit for the path from source to the destination. This value ranges between 68 and 65535.

**Mode** Global Configuration Mode



- Path MTU discovery needs to be enabled to execute this command.
- VRF instance should be created, before executing this command to configure the MTU for the context

**Example** `Your Product(config)# ip path mtu 10.0.0.1 0 1800`

- Related Command(s)**
- `ip vrf` - Creates VRF instance
  - `ip path mtu discovery` - Enables path mtu (Maximum Transmission Unit) discovery
  - `show ip pmtu` - Displays the configured PMTU Entries

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---

## 21.1.11 ip rarp client

---

**Command Objective** This command enables RARP (Reverse Address Resolution Protocol) client. The RARP resolves an IP address from a given hardware address. The client that requests for the IP is the RARP client. The IP address of the default interface is obtained through RARP, when the IP address configuration Mode is dynamic. After RARP Max retries, IP is obtained through DHCP.

The no form of this command disables RARP client.



This command is currently not supported in the code.

---

**Syntax** `ip rarp client`  
`no ip rarp client`

---

**Mode** Interface Configuration Mode

---

**Default** Enabled



The RARP server must be disabled when the RARP client is enabled.

---

**Example** `Your Product(config-if)# ip rarp client`

---

**Related Command(s)**

- `show interfaces` - Displays the interface status and configuration for all interfaces available in the switch.
- `show ip rarp` - Displays RARP configuration information.

---

## 21.1.12 ip directed-broadcast

---

**Command Objective** This command enables forwarding of directed broadcasts. The IP directed broadcast is an IP packet whose destination is a valid IP subnet address, but the source is from a node outside the destination subnet. The routers from outside the subnet forwards the IP directed broadcast, like any other IP packet. When the directed packets reach a router in the destination subnet, the packet is exploded as a broadcast in the subnet. The header information on the broadcast packet is rewritten for the broadcast address in the subnet. The packet is sent as link-layer broadcast.

The no form of this command disables forwarding of directed broadcasts.

---

**Syntax** `ip directed-broadcast`  
`no ip directed-broadcast`

---

**Mode** Vlan Interface Configuration Mode

---

**Default** Disabled

---

**Example** `Your Product(config-if)# ip directed-broadcast`

---

**Related Command(s)**

- `show interfaces` - Displays the interface status and configuration for all interfaces available in the switch.

---

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---

## 21.1.13 show ip rarp

---

<b>Command Objective</b>	This command displays RARP configuration information. RARP Configurations such as Maximum number of RARP request retransmission retries and RARP request retransmission timeout. It also displays the number of responses discarded.
--------------------------	--

---

<b>Syntax</b>	<code>show ip rarp</code>
---------------	---------------------------

---

<b>Mode</b>	Privileged EXEC Mode
-------------	----------------------

---

<b>Example</b>	<pre>Your Product# show ip rarp RARP Configurations: ----- Maximum number of RARP request retransmission retries is 4 RARP request retransmission timeout is 100 seconds RARP Statistics: ----- 0 responses discarded</pre>
----------------	---

---

<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip rarp client request</code> - Sets the number of RARP client request retries</li><li>• <code>ip rarp client</code> - Enables RARP client</li></ul>
---------------------------	--

---

## 21.1.14 show ip pmtu

<b>Command Objective</b>	This command displays the configured PMTU entries. The details include Destination IP address, Type of Service and Path MTU.
<b>Syntax</b>	<code>show ip pmtu [vrf &lt;vrf-name&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li><code>vrf &lt;vrf-name&gt;</code> - Sends an ICMP unreachable message for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.</li> </ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Package</b>	Workgroup, Enterprise, Metro_E and Metro
<b>Default</b>	vrf - default
<b>Example</b>	<pre>Your Product# show ip pmtu       Ip Path MTU Table       ----- Vrf Name      Destination  TOS   PMTU ----- Default       15.0.0.20   0     1500 vrf1          14.0.0.25   0     900  Your Product# show ip pmtu vrf vrf1       Ip Path MTU Table       ----- Vrf Name      Destination  TOS   PMTU ----- vrf1          14.0.0.25   0     900</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><code>ip path mtu</code> - Sets the MTU for usage in PMTU Discovery</li> </ul>

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## 21.2 Commands Common for Aricent and Linux IP

This section describes the commands that are common for SMIS IP and Linux IP. These commands are based on the standard MIB.

The list of CLI commands for the configuration of SMIS and Linux IP is as follows:

- [ping](#)
- [ip route](#)
- [ip routing](#)
- [ip default-ttl](#)
- [arp timeout](#)
- [arp – ip address](#)
- [ip arp max-retries](#)
- [ip proxyarp-subnetoption](#)
- [ipv4 enable](#)
- [ip proxy-arp](#)
- [show ip traffic](#)
- [show ip information](#)
- [show ip route](#)
- [show ip arp](#)
- [show ip proxy-arp](#)

## 21.2.1 ping

**Command Objective** This command sends echo messages. The Packet Internet Groper (Ping) module is built based on the ICMP echo request and ICMP echo response messages. The network administrator uses this ping on a remote device to verify its presence. Ping involves sending ICMP echo messages repeated and measuring the time between transmission and reception of message. The output displays the time taken for each packet to be transmitted, number of packets transmitted, number of packets received and packet loss percentage.

**Syntax**

```
ping [vrf <vrf-name>] [ ip ] {IpAddress | hostname } [data (0-65535)] [df-bit] [{repeat|count} packet_count (1-10)] [size packet_size (36-2080)][source <ip-address>] [timeout time_out (1-100)] [validate]
```

- Parameter Description**
- **vrf<vrf-name>** - Configures IP for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.
  - **ip** - Configures the IP address of the node to be pinged.
  - **IpAddress** - Configures the source IP address of the node to be pinged.
  - **hostname** - Configures the name of the host.
  - **data (0-65535)** - Configures the size of the data. The value ranges between 0 and 65535.
  - **df-bit** - Configures Dont Fragment (DF) bit on the ping packet.
  - **repeat** - Configures number of ping messages.
  - **count** - Configures the number of times the given node address is to be pinged.
  - **packet\_count (1-10)** - Configures the packet count. The value ranges between 1 and 10.
  - **size packet\_size (36-2080)** - Configures the size of the data portion of the PING PDU. This value ranges between 0 and 2080.
  - **source <ip-address>** - Configures the source IP address of the router for the probes.
  - **timeout time\_out (1-100)** - Configures the time in seconds after which the entity waiting for the ping response times out. The value ranges between 1 and 100.
  - **validate** - Validates the reply data.

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- **destination-address** - Configures the destination IP address of the router for the probes.

---

**Mode** Privileged EXEC Mode

- Default**
- size packet\_size 500
  - count packet\_count 3
  - timeout time\_out 5



VRF instance should be created, before executing this command to send echo message for the context

---

**Example**

```
Your Product# ping 10.0.0.2
Reply Received From :10.0.0.2, TimeTaken : 20 msecs
Reply Received From :10.0.0.2, TimeTaken : 10 msecs
Reply Received From :10.0.0.2, TimeTaken : 10 msecs
--- 10.0.0.2 Ping Statistics ---
3 Packets Transmitted, 3 Packets Received, 0% Packets Loss
```

---

**Related Command(s)**

- **ip vrf** - Creates VRF instance.
-



## 21.2.2 ip route

**Command Objective** This command adds a static route. The Route defines the IP address or interface through which the destination can be reached.

The no form of this command deletes a static route.



If the static route is configured without any metric value, then the route will be configured with metric value 1.

### Syntax

```
ip route [vrf <vrf-name>] <prefix> <mask> {<next-hop> |
Vlan <vlan-id/vfi-id> [switch <switch-name>] | <interface-
type> <interface-id> | Linuxvlan <interface-name> | Cpu0 |
tunnel <tunnel-id (0-128)> | <IP-interface-type> <IP-
interface-number>} [<distance (1-254)>] [ private ] [
permanent ] [ name <nexthop-name>]
```

```
no ip route [vrf <vrf-name>] <prefix> <mask> [{ <next-hop>
| Vlan <vlan-id/vfi-id> [switch <switch-name>] |
<interface-type> <interface-id> | Linuxvlan <interface-
name> | Cpu0 | tunnel <tunnel-id (0-128)>}] | <IP-
interface-type> <IP-interface-number>] [private] [
permanent ] [ name <nexthop-name> ]
```

### Parameter Description

- **vrf<vrf-name>** - Adds a static route for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.
- **<prefix>** - Configures the number of high-order bits in the IP address. These bits are common among all hosts within a network.
- **<mask>** - Configures the subnet mask for the IP address. This is a 32-bit number which is used to divide the IP address into network address and host address.
- **<next-hop>** - Defines the IP address or IP alias of the next hop that can be used to reach that network.
- **Vlan <vlan-id/vfi-id>** - Adds a static route for the specified VLAN / VFI ID. This value ranges between 1 and 65535.
  - **<vlan -id>** - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094
  - **<vfi-id>** - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports. This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported.





The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering

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---

Database entries.

 VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW.

 The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.

- **switch<switch-name>** - Adds a static route for the specified context. This value represents unique name of the switch context. feature. This value is a string whose maximum size is 32.
- **<interface-type>** - Adds a static route for the specified type of interface. The interface can be:
  - fastethernet – Officially referred to as 100BASE-T standard. This is a version of LAN standard architecture that supports data transfer upto 100 Megabits per second.
  - gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
  - extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.
  - i-lan -- Internal LAN created on a bridge per IEEE 802.1ap.
- **<interface-id>** - Adds a static route for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash. For example: 0/1 represents that the slot number is 0 and port number is 1.
- **Linuxvlan<interface-name>** - Defines the Interface Name of the Linux VLAN Interface
- **Cpu0** - Sets the Out of Band Management Interface for the route
- **tunnel<id>** - Adds a static route for the specified Tunnel Identifier. This value ranges between 0 and 128.
- **<IP-interface-type>** - Adds a static route for the specified L3 Psuedo wire interface in the system.
- **<IP-interface-number>** - Adds a static route for the specified L3 Psuedo wire interface identifier. This is a unique value that represents the specific interface. This value ranges between 1 and 65535 for Psuedowire interface.

 Maximum number of PseudoWire interfaces supported in the system is 100.
- **<distance (1-254)>** - Defines the Administrative distance as per the

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metrics. This value ranges between 1 and 254.

- **private** - Sets the Private route
- **permanent** - Sets the permanent route.
- **name <nexthop-name>** - Configures next hop name for the newly added static route.

---

**Mode** Global Configuration Mode

---

**Default** distance - -1



- When the next-hop object is unknown or not relevant its value must be set to zero.
- Interface must be a router port.
- VRF instance should be created, before executing this command to add static route for the context.
- VRF instance should be mapped to the IPV4 / IPV6 interface, before executing this command to add the static routes for the context in the interface.

---

**Example** `Your Product(config)# ip route 30.0.0.2 255.255.255.255  
Vlan 1`

- 
- Related Command(s)**
- **ip vrf** - Creates VRF instance.
  - **ip vrf forwarding** - Maps the IPV4 / IPV6 interface to the context.
  - **show ip route** - Displays the IP routing table.
  - **no switchport** – Configures the port as a router port.
-

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---

## 21.2.3 ip routing

---

**Command Objective** This command enables IP routing. IP routing is the path defined by set of protocols for the data to follow across multiple networks from source to its destination. When an IP packet is to be forwarded, the router uses its forwarding table to determine the next hop address for the packet to reach its destination. The header in the IP packet consists of the next hop information.

The no form of this command disables IP routing.

---

**Syntax** `ip routing [vrf <vrf-name>]`  
`no ip routing [vrf <vrf-name>]`

---

**Parameter Description**

- `vrf<vrf-name>` - Enables IP routing for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.

---

**Mode** Global Configuration Mode

---

**Default** IP routing is enabled



VRF instance should be created, before executing this command to configure IP routing for the context.

---

**Example** `Your Product(config)# ip routing`

---

**Related Command(s)**

- `ip vrf` -Creates VRF instance
- `show ip information` - Displays IP configuration information
- `show ip route` - Displays the IP routing table

---

## 21.2.4 ip default-ttl

**Command Objective** This command sets the Time-To-Live (TTL) value. TTL is the time set for a unit of data (a packet) to remain in the network or computer before it could be discarded. This value ranges between 1 and 255 seconds.

The no form of this command sets the TTL to the default value.

---

**Syntax** `ip default-ttl [vrf <vrf-name>] <value (1-255)>`

`no ip default-ttl [vrf <vrf-name>]`

---

**Parameter Description**

- `vrf<vrf-name>` - Sets the Time-To-Live (TTL) value for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.

---

**Mode** Global Configuration Mode

---

**Default** 64 seconds



VRF instance should be created, before executing this command to configure TTL value for the context.

---

**Example** `Your Product(config)# ip default-ttl 1`

---

**Related Command(s)**

- `ip vrf` -Creates VRF instance
- `show ip information` - Displays IP configuration information

---

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---

## 21.2.5 arp timeout

---

**Command Objective** This command sets the ARP (Address Resolution Protocol) cache timeout. The arp timeout defines the time period an arp entry remains in the cache. When a new timeout value is assigned, it only affects the new arp entries. All the older entries retain their old timeout values. The timeout values can be assigned to dynamic arp entries only. All static arp entries remain unaltered by the timeout value. This value ranges between 30 and 86400 seconds.

The no form of this command sets the ARP cache timeout to its default value.

---

**Syntax** `arp [vrf <vrf-name>] timeout <seconds (30-86400)>`

`no arp [vrf <vrf-name>] timeout`

---

**Parameter Description**

- `vrf <vrf-name>` - Sets the ARP cache timeout for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.

---

**Mode** Global Configuration Mode

---

**Default** 7200



VRF instance should be created, before executing this command to configure ARP cache timeout for the context.

---

**Example** `Your Product(config)# arp timeout 35`

---

**Related Command(s)**

- `ip vrf` - Creates VRF instance
- `show ip arp` - Displays IP ARP table for the given VLAN ID/IP Address of ARP entry/MAC Address of ARP entry/IP ARP summary table/ARP configuration information

---

## 21.2.6 arp – ip address




**Command Objective** This command adds a static entry in the ARP cache. The ARP finds the hardware address of the client and stores them in arp cache. The arp entry can be configured manually by using this command. The entry is stored permanently in the arp cache as a static entry.

The no form of this command deletes a static entry from the ARP cache.

**Syntax**

```
arp [vrf <vrf-name>] <ip address> <hardware address> {Vlan <vlan-id/vfi-id> [switch <switch-name>] | <interface-type> <interface-id> | Linuxvlan <interface-name>| Cpu0 | <IP-interface-type> <IP-interface-number>}
```


```
no arp [vrf <vrf-name>] <ip address>
```

- Parameter Description**
- **vrf<vrf-name>** - Adds a static entry in the ARP cache for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.
  - **<ip address>** - Defines the IP address or IP alias to map to the specified MAC address.
  - **<hardware address>** - Defines the MAC address to map to the specified IP address or IP alias.
  - **Vlan <vlan-id/vfi-id>** - Adds a static entry in the ARP cache for the specified VLAN / VFI ID. This value ranges between 1 and 65535.
    - **<vlan -id>** - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094
    - **<vfi-id>** - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports. This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535
      -  The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries. This interface type is not supported.
      -  VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW.
      -  The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.
  - **switch <switch-name >** - Adds a static entry in the ARP cache for

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the specified context. This value represents unique name of the switch context. feature. This value is a string whose maximum size is 32. It is specific to multiple instance feature.

- **<interface-type>** - Adds a static static entry in the ARP cache for the specified interface.
  - qx-ethernet – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.
  - gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
  - extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.
- **<interface-id>** - Adds a static static entry in the ARP cache for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. For example: 0/1 represents that the slot number is 0 and portnumber is 1. Only port-channel ID is provided, for interface type port-channel. For example:1 represents port-channel ID.
- **Linuxvlan<interface-name>** - Sets the Linux VLAN Interface
- **Cpu0** - Sets the Out of Band Management Interface for the route.
- **<IP-interface-type>** - Adds a static static entry in the ARP cache for the specified L3 Psuedo wire interface in the system.
- **<IP-interface-number>** - Adds a static static entry in the ARP cache for the specified L3 Psuedo wire interface identifier. This is a unique value that represents the specific interface . This value ranges between 1 and 65535 for Psuedowire interface.
  -  Maximum number of PseudoWire interfaces supported in the system is 100.

---

## Mode

Global Configuration Mode



- Interface must be a router port.
- VRF instance should be created, before executing this command to add static entry for the context.
- VRF instance should be mapped to the IPV4 / IPV6 interface, before executing this command to add static entry for the context in the interface.

---

## Example

```
Your Product(config)# arp 10.203.120.21  
00:11:22:33:44:55 vlan 1
```

---



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---

## Related Command(s)

- `ip vrf` - Creates VRF instance
  - `ip vrf information` - Maps the IPV4 / IPV6 interface to the context
  - `show ip arp` - Displays IP ARP table for the given VLAN ID/IP Address of ARP entry/MAC Address of ARP entry/IP ARP summary table/ARP configuration information
  - `no switchport` - Configures the port as a router port
-

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---

## 21.2.7 ip arp max-retries

---

**Command Objective** This command sets the maximum number of ARP request retries. The maximum number of ARP requests that the switch generates before deleting an un-resolved ARP entry is defined.

The no form of this command sets the maximum number of ARP request retries to its default value.

---

**Syntax** `ip arp [vrf <vrf-name>] max-retries <value (2-10)>`  
`no ip arp [vrf <vrf-name>] max-retries`

---

**Parameter Description**

- `vrf<vrf-name>` - Sets maximum number of ARP request retries for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.
- `<value (2-10)>` - Configures the maximum number of ARP request entries. The value ranges between 2 and 10.

---

**Mode** Global Configuration Mode

---

**Default** 3



VRF instance should be created, before executing this command to configure the maximum number of ARP request retries for the context.

---

**Example** `Your Product(config)# ip arp max-retries 2`

---

**Related Command(s)**

- `ip vrf` - Creates VRF instance
- `show ip arp` - Displays IP ARP table for the given VLAN ID/IP Address of ARP entry/MAC Address of ARP entry/IP ARP summary table/ARP configuration information

---

## 21.2.8 ip proxyarp-subnetoption

---

<b>Command Objective</b>	<p>This command enables proxy ARP subnet check. ISS acts as ARP proxy for target address in different subnet, when subnet check is enabled.</p> <p>The no form of the command disables proxy ARP subnet check. ISS acts as ARP proxy for target address in same or different subnet that is used in IP-DSLAM (Digital Subscriber Line Access Multiplexer) case, when subnet check is disabled.</p>
<b>Syntax</b>	<pre>ip proxy-arp-subnetoption</pre> <pre>no ip proxy-arp-subnetoption</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	Proxy ARP subnet check is enabled.
<b>Example</b>	<pre>Your Product(config)# ip proxy-arp-subnetoption</pre>

---

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---

## 21.2.9 ipv4 enable

---

**Command Objective** This command enables IPv4 processing on the interface that has not been configured with an explicit IPv4 address.

The no form of this command disables IPv4 processing on the interface.

---

**Syntax** `ipv4 enable`  
`no ipv4 enable`

---

**Mode** Interface Configuration Mode (Vlan)

---

**Default** enable

---

**Example** `Your Product(config-if)# ipv4 enable`

---

**Related Command(s)**

- `show ip information` - Displays IP configuration information

---

## 21.2.10 ip proxy-arp

---

<b>Command Objective</b>	This command enables proxy ARP for the interface.  The no form of the command disables proxy ARP for the interface.
<b>Syntax</b>	<code>ip proxy-arp</code>  <code>no ip proxy-arp</code>
<b>Mode</b>	Interface Configuration Mode (Vlan)
<b>Default</b>	Proxy ARP is disabled.
<b>Example</b>	<code>Your Product(config-if)# ip proxy-arp</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip proxy-arp</code> - Displays the status of the proxy ARP for all the created interfaces.</li></ul>

---

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---

## 21.2.11 show ip traffic

---

**Command Objective** This command displays the IP protocol statistics.




---

**Syntax**

```
show ip traffic [vrf <vrf-name>] [ interface { Vlan<vlan-id/vfi-id> [switch <switch-name>] | tunnel <tunnel-id (1-128)> | <interface-type> <interface-id> | Linuxvlan <interface-name> | <IP-interface-type> <IP-interface-number> } ] [hc]
```


---

**Parameter Description**

- **vrf<vrf-name>** - Displays the IP protocol statistics information for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.
- **Vlan <vlan-id/vfi-id>** - Displays the ip protocol statistics for the specified VLAN / VFI ID. This value ranges between 1 and 65535.
  - **<vlan -id>** - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094
  - **<vfi-id>**. - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports. This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported.
    -  The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.
    -  VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW.
    -  The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.
- **switch<switch-name>** - Displays the IP protocol statistics information for the specified context. This value represents unique name of the switch context. feature. It is specific for multiple instance feature.
- **tunnel<tunnel-id (1-128)>** - Displays the Tunnel identifier. The value ranges between 1 and 128.
- **<interface-type>** - Displays the IP protocol statistics information for the specified interface type. The interface can be:
  - qx-ethernet – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.

---

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- gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
- extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.
- **<interface-id>** - Displays the interface id. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. For example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided for interface type port-channel. Forexample: 1 represents port-channel ID.
- **Linuxvlan <interface-name>** - Displays the Linux IP Vlan identifier
- **<IP-interface-type>** - Displays the IP statistics for the specified L3 Psuedo wire interface in the system.
- **<IP-interface-number>** - Displays the IP statistics for the specified L3 Psuedo wire interface identifier. This is a unique value that represents the specific interface . This value ranges between 1 and 65535 for Psuedowire interface.
  -  Maximum number of PseudoWire interfaces supported in the system is 100.
- **hc** - Displays the High counters statistics information.

---

**Mode** Privileged EXEC Mode

---

**Example** Your Product# show ip traffic

```
VRF Name:          default
-----
IP Statistics
-----
Rcvd:  0 total, 0 header error discards
      0 bad ip address discards, 0 unsupported protocol
discards
Frag:  0 reassembled, 30 timeouts, 0 needs reassembly
      0 fragmented, 0 couldn't fragment
Bcast:  Sent:  0 forwarded, 0 generated requests
Drop:
      0  InDiscards    0  InDelivers    0  InMcastPkts
      0  InTruncated  0  InOctets     0  InNoRoutes
```

---

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---

```
0 ReasmFails 0 InMcast Octets 0 InBcastPkts
0 OutDiscards 0 OutMcastPkts 0
OutFrgCreates
0 OutForwDgrms 0 OutTrnsmits 0 OutFrgRqds
0 OutOctets 0 OutMcstOctets 0 OutBcstPkts
0 DiscntTime 1000 RefrshRate

ICMP Statistics:
-----
Rcvd: 0 total, 0 checksum errors, 0 unreachable, 0
redirects
    0 time exceeded, 0 param problems, 0 quench
    0 echo, 0 echo reply, 0 mask requests, 0 mask
replies,
    0 timestamp , 0 time stamp reply,
Sent: 0 total, 0 checksum errors, 0 unreachable, 0
redirects
    0 time exceeded, 0 param problems, 0 quench
    0 echo, 0 echo reply, 0 mask requests, 0 mask
replies,
    0 timestamp , 0 time stamp reply,
VRF Name: vr1
-----
IP Statistics
-----
Rcvd: 0 total, 0 header error discards
    0 bad ip address discards, 0 unsupported protocol
discards
Frgs: 0 reassembled, 30 timeouts, 0 needs reassembly
    0 fragmented, 0 couldn't fragment
Bcast: Sent: 0 forwarded, 0 generated requests
Drop:
0 InDiscards 0 InDelivers 0 InMcastPkts
0 InTruncated 0 InOctets 0 InNoRoutes
0 ReasmFails 0 InMcast Octets 0 InBcastPkts
0 OutDiscards 0 OutMcastPkts 0
OutFrgCreates
0 OutForwDgrms 0 OutTrnsmits 0 OutFrgRqds
0 OutOctets 0 OutMcstOctets 0 OutBcstPkts
0 DiscntTime 1000 RefrshRate
```

---



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ICMP Statistics:

-----

Rcvd: 0 total, 0 checksum errors, 0 unreachable, 0 redirects

0 time exceeded, 0 param problems, 0 quench

0 echo, 0 echo reply, 0 mask requests, 0 mask replies,

0 timestamp , 0 time stamp reply,

Sent: 0 total, 0 checksum errors, 0 unreachable, 0 redirects

0 time exceeded, 0 param problems, 0 quench

0 echo, 0 echo reply, 0 mask requests, 0 mask replies,

0 timestamp , 0 time stamp reply,

**Your Product# show ip traffic vrf vr1**

VRF Name: vr1

-----

IP Statistics

-----

Rcvd: 0 total, 0 header error discards

0 bad ip address discards, 0 unsupported protocol discards

Frgs: 0 reassembled, 30 timeouts, 0 needs reassembly

0 fragmented, 0 couldn't fragment

Bcast: Sent: 0 forwarded, 0 generated requests

Drop:

0 InDiscards 0 InDelivers 0 InMcastPkts

0 InTruncated 0 InOctets 0 InNoRoutes

0 ReasmFails 0 InMcast Octets 0 InBcastPkts

0 OutDiscards 0 OutMcastPkts 0

OutFrgCreates

0 OutForwDgrms 0 OutTrnsmits 0 OutFrgRqds

0 OutOctets 0 OutMcastOctets 0 OutBcastPkts

0 DiscntTime 1000 RefrshRate

ICMP Statistics:

-----

Rcvd: 0 total, 0 checksum errors, 0 unreachable, 0 redirects

0 time exceeded, 0 param problems, 0 quench

---


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---

```
0 echo, 0 echo reply, 0 mask requests, 0 mask
replies,
0 timestamp , 0 time stamp reply,
Sent: 0 total, 0 checksum errors, 0 unreachable, 0
redirects
0 time exceeded, 0 param problems, 0 quench
0 echo, 0 echo reply, 0 mask requests, 0 mask
replies,
0 timestamp , 0 time stamp reply,
```

---

## 21.2.12 show ip information

<b>Command Objective</b>	This command displays IP configuration information.
<b>Syntax</b>	<code>show ip information [vrf &lt;vrf-name&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li><code>vrf &lt;vrf-name&gt;</code> - Displays the configured IP information for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Default</b>	vrf - default
	For Linux IP, this command displays only the IP Routing status and the default TTL value.
<b>Example</b>	<pre>Your Product# show ip information VRF Name:      default Global IP Configuration: ----- IP routing is enabled default TTL is 64 ICMP redirects are always sent ICMP unreachable are always sent ICMP echo replies are always sent ICMP mask replies are always sent Number of aggregate routes is 50 Number of multi-paths is 2 Load sharing is disabled Path MTU discovery is disabled VRF Name:      vr1 Global IP Configuration: ----- IP routing is enabled default TTL is 64 ICMP redirects are always sent</pre>

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---

```
ICMP unreachable are always sent
ICMP echo replies are always sent
ICMP mask replies are always sent
Number of aggregate routes is 50
Number of multi-paths is 2
Load sharing is disabled
Path MTU discovery is disabled
```

```
Your Product# show ip information vrf vr1
```

```
VRF Name:      vr1
```

```
Global IP Configuration:
```

```
-----
IP routing is enabled
default TTL is 64
ICMP redirects are always sent
ICMP unreachable are always sent
ICMP echo replies are always sent
ICMP mask replies are always sent
Number of aggregate routes is 50
Number of multi-paths is 2
Load sharing is disabled
Path MTU discovery is disabled
```

---

## Related Command(s)

- **ip redirects** - Enables sending ICMP
  - **ip unreachable** - Enables sending ICMP unreachable message
  - **ip mask-reply** - Enables sending ICMP Mask Reply messages
  - **ip echo-reply** - Enables sending ICMP Echo Reply messages
  - **maximum-paths** - Sets the maximum number of multipaths
  - **ip aggregate-route** - Sets the maximum number of aggregate routes
  - **ip path mtu discover** - Enables path mtu discovery
  - **traffic-share** - Enables traffic sharing
  - **ip routing** - Enables IP routing
  - **ip default-ttl** - Sets the Time-To-Live (TTL) value.
  - **ipv4 enable** - Enables IPv4 processing on the interface
-

## 21.2.13 show ip route

<b>Command Objective</b>	This command displays the IP routing table.
<b>Syntax</b>	<pre>show ip route [vrf &lt;vrf-name&gt;] [ { &lt;ip-address&gt; [&lt;mask&gt;]   bgp   connected   ospf   rip   static   summary } ]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>vrf&lt;vrf-name&gt;</b> - Displays the IP routing table for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.</li><li>• <b>&lt;ip-address&gt;</b> - Displays the IP routing table for the specified destination IP Address.</li><li>• <b>&lt;mask&gt;</b> - Displays the IP routing table for the specified prefix mask address.</li><li>• <b>bgp</b> - Displays the Border Gateway Protocol if it is used by the table to get route information.</li><li>• <b>connected</b> - Displays the Directly Connected Network Routes.</li><li>• <b>ospf</b> - Displays the OSPF (Open Shortest Path First) protocol if it is used for getting route information.</li><li>• <b>rip</b> - Displays the RIP (Routing Information Protocol) if it is used for getting route information.</li><li>• <b>static</b> - Displays the Static Routes in the table.</li><li>• <b>summary</b> - Displays the Summary of all routes.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Default</b>	vrf - default
<b>Example</b>	<pre>Your Product# show ip route Codes: C - connected, S - static, R - rip, B - bgp, O - ospf IA - OSPF inter area, N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2, E1 - OSPF external type 1, E2 - OSPF external type 2 Vrf Name:          default -----</pre>

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---

```
C 12.0.0.0/8 is directly connected, vlan1
O IA 15.0.0.0/8 [2] via 12.0.0.7
O E2 20.0.0.0/8 [10] via 12.0.0.7
```

```
Your Product# show ip route vrf vr1
```

```
Vrf Name:          vr1
```

```
-----
```

```
C 14.0.0.0/8 is directly connected, vlan3
```

```
Your Product# show ip route summary
```

```
VRF Name:          default
```

```
-----
```

```
Route SourceRoutes
```

```
connected          2
```

```
static              0
```

```
rip                 0
```

```
bgp                 0
```

```
ospf                2
```

```
Total              4
```




```
Total ECMP routes 2
```

---

## Related Command(s)


- **ip route** - Adds a static route.
  - **ip routing** - Enables IP routing.
-

## 21.2.14 show ip arp

<b>Command Objective</b>	This command displays IP ARP table.
<b>Syntax</b>	<pre>show ip arp [vrf &lt;vrf-name&gt;][ { Vlan &lt;vlan-id/vfi-id&gt; [switch &lt;switch-name&gt;]   &lt;interface-type&gt; &lt;interface-id&gt;   &lt;ipiftype&gt; &lt;ifnum&gt;   &lt;ip-address&gt;   &lt;mac-address&gt;   summary   information   statistics }]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>vrf&lt;vrf-name&gt;</b> - Displays the IP ARP information for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.</li> <li>• <b>Vlan &lt;vlan-id/vfi-id&gt;</b> - Displays the IP ARP information for the specified VLAN / VFI ID. This value ranges between 1 and 65535. <ul style="list-style-type: none"> <li>– <b>&lt;vlan -id&gt;</b> - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094</li> <li>– <b>&lt;vfi-id&gt;</b> - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports. This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported. <ul style="list-style-type: none"> <li> The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.</li> <li> VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW.</li> <li> The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.</li> </ul> </li> </ul> </li> <li>• <b>switch&lt;switch-name&gt;</b> - Displays the IP ARP information for the specified context. This value represents unique name of the switch context.</li> <li>• <b>&lt;interface-type&gt;</b> - Displays specified type of interface. The interface can be: <ul style="list-style-type: none"> <li>– <b>qx-ethernet</b> –A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>– <b>gigabitethernet</b> – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.</li> <li>– <b>extreme-ethernet</b> – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.</li> </ul> </li> </ul>

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- **<interface-id>** - Displays the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, For example: 0/1 represents that the slot number is 0 and port number is 1.
- **<ipiftype>** - Displays the IP ARP information for the specified L3 Psuedo wire interface in the system.
- **<ifnum>** - Displays the IP ARP information for the specified L3 Psuedo wire interface identifier. This is a unique value that represents the specific interface . This value ranges between 1 and 65535 for Psuedowire interface.
  -  Maximum number of PseudoWire interfaces supported in the system is 100.
- **<ip-address>** - Displays the IP Address of ARP Entry
- **<mac-address>** - Displays the MAC Address of ARP Entry
- **summary** - Displays IP ARP Table summary
- **information** - Displays the ARP Configuration information regarding maximum retries and ARP cache timeout.

---

**Mode** Privileged EXEC Mode

---

**Example** **Your Product# show ip arp**

```
VRF Id : 0
VRF Name: default
Address          Hardware Address  Type  Interface  Mapping
-----
12.0.0.100      00:1b:11:c2:94:f6  ARPA  vlan1      Dynamic
15.0.0.10       00:03:02:03:01:04  ARPA  vlan2      Static
VRF Id : 1
VRF Name: vr1
Address          Hardware Address  Type  Interface  Mapping
-----
14.0.0.10       00:04:02:03:01:04  ARPA  vlan3      Static
```

**Your Product# show ip arp vrf vr1**

```
VRF Id : 1
VRF Name: vr1
Address          Hardware Address  Type  Interface  Mapping
```

---



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```
-----  
14.0.0.10          00:04:02:03:01:04  ARPA  vlan3      Static
```

```
Your Product# show ip arp 12.100
```

```
Address Hardware Address  Type  Interface  Mapping VRF Name  
-----
```

```
12.0.0.100  00:1b:11:c2:94:f6  ARPA  vlan1  Dynamic default
```

```
Your Product# show ip arp 00:04:02:03:01:04
```

```
Address Hardware Address Type  Interface  Mapping VRF Name  
-----
```

```
14.0.0.10  00:04:02:03:01:04  ARPA  vlan1  Static  default
```

```
14.0.0.10  00:04:02:03:01:04  ARPA  vlan3  Static  vr1
```

```
Your Product# show ip arp summary
```

```
VRF Name:      default
```

```
3 IP ARP entries, with 0 of them incomplete
```

```
VRF Name:      vr1
```

```
1 IP ARP entries, with 0 of them incomplete
```

```
Your Product# show ip arp vrf vr1 summary
```

```
VRF Name:      vr1
```

```
1 IP ARP entries, with 0 of them incomplete
```

```
Your Product# show ip arp information
```

```
ARP Configurations:  
-----
```

```
VRF Name:  default
```

```
Maximum number of ARP request retries is 3
```

```
ARP cache timeout is 300 seconds
```

```
VRF Name:  vr1
```

```
Maximum number of ARP request retries is 3
```

```
ARP cache timeout is 300 seconds
```

```
Your Product# show ip arp vrf vr1 information
```

```
ARP Configurations:  
-----
```

```
VRF Name:  vr1
```

```
Maximum number of ARP request retries is 3
```

```
ARP cache timeout is 300 seconds
```

---

## Related Command(s)

- `arp timeout` - Sets the ARP (Address Resolution Protocol) cache

# Supermicro Switch Configuration CLI Guide

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---

timeout

- **arp - ip address** - Adds a static entry in the ARP cache
  - **ip arp max-retries** - Sets the maximum number of ARP request retries
-

## 21.2.15 show ip proxy-arp

<b>Command Objective</b>	This command displays the status of the proxy ARP for all the created interfaces.
<b>Syntax</b>	<code>show ip proxy-arp [vrf &lt;vrf-name&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li><code>vrf&lt;vrf-name&gt;</code> - Displays the status of the proxy ARP for the specified VRF instance. This value represents unique name of the VRF instance. This value is a string whose maximum size is 32.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show ip proxy-arp PROXY ARP Status ----- vlan1      : Disabled vlan2      : Disabled vlan3      : Disabled -----  Your Product# show ip proxy-arp vrf default PROXY ARP Status ----- vlan1      : Disabled vlan2      : Disabled -----</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><code>ip proxy-arp</code> - Enables proxy ARP for the interface</li></ul>

## Chapter

# 22

## DHCP

---

**DHCP (Dynamic Host Configuration Protocol)** is used in a wide variety of devices like ISDN routers, firewalls, etc., for assigning IP addresses to workstations. Besides obtaining IP address, other configuration parameters for a workstation can also be configured in a DHCP server. DHCP clients can retrieve these parameters along with the IP address.

DHCP is based on the client-server architecture. DHCP servers are configured with an IP address and several other configuration parameters. DHCP clients, typically workstations obtain this IP address at start-up. The client obtains the address for a time period termed as the "lease" period. DHCP clients renew the address by sending a request for the IP address before the lease expires.

DHCP uses UDP as its transport protocol and a UDP port for communication. DHCP relay agents connect servers present on one LAN with the client present on another.

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## 22.1 DHCP Client

DHCP client uses DHCP to temporarily receive a unique IP address for it from the DHCP server. It also receives other network configuration information such as default gateway, from the DHCP server.

The list of CLI commands for the configuration of DHCP Client is as follows:

- [debug ip dhcp client](#)
- [release dhcp](#)
- [renew dhcp](#)
- [show ip dhcp client stats](#)
- [ip dhcp client discovery timer](#)
- [ip dhcp client idle timer](#)
- [ip dhcp client arp-check timer](#)
- [ip dhcp client fast-access](#)
- [ip dhcp client client-id](#)
- [ip dhcp client request](#)
- [show ip dhcp client fast-access](#)
- [show ip dhcp client option](#)
- [show ip dhcp client client-id](#)

## 22.1.1 debug ip dhcp client

---

<b>Command Objective</b>	<p>This command enables the tracking of the DHCP client operations as per the configured debug levels. The debug statements are generated for the specified trace levels.</p> <p>The no form of the command disables the tracking of the DHCP client operations. The debug statements are not generated for the specified trace levels.</p> <p>This command allows combination of debug levels to be configured (that is, more than one level of trace can be enabled or disabled). The debug levels are configured one after the other and not in single execution of the command.</p>
<b>Syntax</b>	<pre>debug ip dhcp client { all   event   packets   errors   bind }  no debug ip dhcp client { all   event   packets   errors   bind }</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>all</b> - Generates debug statements for all kind of failure traces.</li><li>• <b>event</b> - Generates debug statements for DHCP client events that provide DHCP client service status. The DHCP client events are generated when any of packets are sent successfully or when an ACK is received.</li><li>• <b>packets</b> - Generates debug statements for packets related messages. These messages are generated for all events generated during processing of packets.</li><li>• <b>errors</b> - Generates debug statements for trace error code debug messages. These messages are generated for all error events generated.</li><li>• <b>bind</b> - Generated debug statements for trace bind messages. These messages are generated when a DHCP ACK is received.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Default</b>	Tracking of the DHCP client operations is disabled.
<b>Example</b>	Your Product# debug ip dhcp client all
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>show debugging</b> - Displays state of each debugging option</li></ul>

---

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## 22.1.2 release dhcp

**Command Objective** This command immediately releases the DHCP lease obtained for an IP address from a DHCP server and assigned to the specified interface. The current lease assigned to that interface is terminated manually.

The lease is terminated to reset the DHCP client which faces connectivity problem. The DHCP lease provided by the DHCP server represents the time interval till which the DHCP client can use the assigned IP address.

**Syntax** `release dhcp { vlan <vlan-id (1-4094)> | <interface-type> <interface-id> }`

- Parameter Description**
- `<vlan-id (1-4094)>` - Releases the DHCP lease for the specified VLAN ID. This is a unique value that represents the specific VLAN created. This value ranges between 1 and 4094.
  - `vlanMgmt` - Releases the DHCP lease for the management vlan interface.
  - `<interface-type>` - Releases the DHCP lease for the specified type of interface. The interface can be:
    - `qx-ethernet` – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
    - `gigabitethernet` – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
    - `extreme-ethernet` – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
  - `<interface-id>` - Releases the DHCP lease for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. For example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided for interface type port-channel. For example: 1 represents port-channel ID.

**Mode** Privileged EXEC Mode



This command executes successfully only if the VLAN interfaces and router ports are in BOUND state (that is, IP address is dynamically acquired from DHCP server and an active lease is bound to the interface). The port should have been configured as router port for dynamically acquiring an IP address from DHCP server.

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**Example**

Your Product# `release dhcp vlan 1`

---


**Related Command(s)**

- `no switchport` – Configures the port as a router port.
  - `ip address` – rarp/dhcp - Configures the current VLAN / OOB interface to dynamically acquire an IP address from the RARP / DHCP server.
  - `show ip dhcp client stats` - Displays the DHCP client statistics information for interfaces that are configured to acquire IP address dynamically from the DHCP server.
  - `show ip interfaces` - Displays the IP interface configuration for all interfaces available in the switch.
-



# Supermicro Switch Configuration CLI Guide

## 22.1.3 renew dhcp

<b>Command Objective</b>	This command immediately renews the DHCP lease for the interface specified. The current lease acquired by the specified interface is manually renewed or else a new DHCP lease is acquired for interface whose lease is terminated. The DHCP lease is automatically renewed, once the lease expires.
<b>Syntax</b>	<pre>renew dhcp { vlan &lt;vlan-id (1-4094)&gt;   &lt;interface-type&gt; &lt;interface-id&gt; }</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>vlan &lt;vlan-id (1-4094)&gt;</b> - Renews the DHCP lease for the specified VLAN ID. This is a unique value that represents the specific VLAN created. This value ranges between 1 and 4094.</li><li>• <b>vlanMgmt</b> - Renews the DHCP lease for the management vlan interface.</li><li>• <b>&lt;interface-type&gt;</b> - Renews the DHCP lease for the specified type of interface. The interface can be:<ul style="list-style-type: none"><li>– qx-ethernet – A version of LAN standard architecture that supports data transfer up to 40 Ggigabits per second. This Ethernet supports only full duplex links.</li><li>– gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.</li><li>– extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.</li></ul></li><li>• <b>&lt;interface-id&gt;</b> - Renews the DHCP lease for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. For example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided for interface type port-channel. For example: 1 represents port-channel ID.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
	This command executes successfully only if the VLAN interfaces and router ports are in BOUND state (that is, IP address is dynamically acquired from DHCP server and an active lease is bound to the interface). The port should have been configured as router port for dynamically acquiring an IP address from DHCP server.
<b>Example</b>	<pre>Your Product# renew dhcp vlan 1</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>no switchport</b> – Configures the port as a router port.</li></ul>

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- **ip address - rarp/dhcp** - Configures the current VLAN / OOB interface to dynamically acquire an IP address from the RARP / DHCP server.
  - **show ip dhcp client stats** - Displays the DHCP client statistics information for interfaces that are configured to acquire IP address dynamically from the DHCP server.
  - **show ip interface** - Displays the IP interface configuration for all interfaces available in the switch.
-

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## 22.1.4 show ip dhcp client stats

<b>Command Objective</b>	<p>This command displays the DHCP client statistics information for interfaces that are configured to acquire IP address dynamically from the DHCP server.</p> <p>The statistics information contains interface name, IP address assigned by DHCP server, DHCP lease details, details regarding number of DHCPDISCOVER, DHCPREQUEST, DHCPDECLINE, DHCPRELEASE and DHCPINFORM packets received and number of DHCPOFFER packets sent from the DHCP client.</p>
<b>Syntax</b>	<code>show ip dhcp client stats</code>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show ip dhcp client stats Dhcp Client Statistics ----- Interface                : vlan1 Client IP Address        : 12.0.0.21 Client Lease Time        : 3600 Client Remain Lease Time : 3569 Message Statistics ----- DHCP DISCOVER           : 1 DHCP REQUEST            : 1 DHCP DECLINE            : 0 DHCP RELEASE            : 0 DHCP INFORM             : 0 DHCP OFFER              : 1</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip address - rarp/dhcp</code> - Configures the current VLAN / OOB interface to dynamically acquire an IP address from the RARP / DHCP server.</li><li>• <code>release dhcp</code> - Releases, on the specified interface, the DHCP lease obtained for an IP address from a DHCP server.</li><li>• <code>renew dhcp</code> - Renews the DHCP lease for the interface specified.</li></ul>

## 22.1.5 ip dhcp client discovery timer

<b>Command Objective</b>	<p>This command configures DHCP Client Discovery timer, which denotes the time to wait between discovery messages sent by the DHCP client. This value ranges between 1 and 9.</p> <p>The no form of the command resets DHCP Client discovery timer with its default values.</p>
<b>Syntax</b>	<pre>ip dhcp client discovery timer &lt;integer (1-9)&gt;</pre> <pre>no ip dhcp client discovery timer</pre>
<b>Mode</b>	Privileged EXEC Mode
<b>Default</b>	<ul style="list-style-type: none"><li>• If dhcp fast mode is enabled , the default DHCP Client Discovery timer is 5.</li><li>• If dhcp fast mode is disabled , the default DHCP Client Discovery timer is 15.</li></ul>
<b>Example</b>	<pre>Your Product# ip dhcp client discovery timer 8</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip dhcp client fast-access</code> - Displays DHCP fast access details</li><li>• <code>ip dhcp client fast-access</code> - Enables DHCP fast access Mode</li></ul>

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## 22.1.6 ip dhcp client idle timer

<b>Command Objective</b>	<p>This command configures DHCP Client idle timer which specifies the time to wait after four unsuccessful DHCP client discovery messages. This value ranges between 1 and 30.</p> <p>The no form of the command resets the DHCP Client idle timer with the default values.</p>
<b>Syntax</b>	<pre>ip dhcp client idle timer &lt;integer (1-30)&gt;</pre> <pre>no ip dhcp client idle timer</pre>
<b>Mode</b>	Privileged EXEC Mode
<b>Default</b>	<ul style="list-style-type: none"><li>• If dhcp fast mode is enabled , the default DHCP Client Idle timer is 1.</li><li>• If dhcp fast mode is disabled , the default DHCP Client Idle timer is 180.</li></ul>
<b>Example</b>	<pre>Your Product# ip dhcp client idle timer 8</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip dhcp client fast-access</code> - Displays DHCP fast access details</li><li>• <code>ip dhcp client fast-access</code> - Enables DHCP fast access Mode</li></ul>

## 22.1.7 ip dhcp client arp-check timer

<b>Command Objective</b>	<p>This command configures DHCP client retransmission timeout between arp messages. This value ranges between 1 and 20.</p> <p>The no form of the command resets DHCP Client arp timer with the default values.</p>
<b>Syntax</b>	<pre>ip dhcp client arp-check timer &lt;integer (1-20)&gt;</pre> <pre>no ip dhcp client arp-check timer</pre>
<b>Mode</b>	Privileged EXEC Mode
<b>Default</b>	<ul style="list-style-type: none"><li>• If dhcp fast mode is enabled , the default DHCP Client arp-check timer is 1.</li><li>• If dhcp fast mode is disabled , the default DHCP Client arp-check timer is 3.</li></ul>
<b>Example</b>	<pre>Your Product# ip dhcp client arp-check timer 8</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip dhcp client fast-access</code> - Enables DHCP fast access Mode</li><li>• <code>show ip dhcp client fast-access</code> - Displays DHCP fast access details</li></ul>

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## 22.1.8 ip dhcp client fast-access

<b>Command Objective</b>	<p>This command enables DHCP fast access Mode.</p> <p>If fast access mode is enabled, time to wait between discovery messages i.e. discovery timeout and time to wait after four unsuccessful discovery will be user configurable and the default value for discovery timeout is 5 seconds and for the null state timeout is 1 second.</p> <p>The no form of the command disables DHCP Client fast access mode. If the mode is disabled, default value for discovery timeout and null state timeout will be 15 seconds and 180 seconds respectively. The timeout values cannot be changed under disable mode.</p>
<b>Syntax</b>	<pre>ip dhcp client fast-access</pre> <pre>no ip dhcp client fast-access</pre>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# ip dhcp client fast-access</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip dhcp client discovery timer</code> – Configures DHCP Client Discovery timer,</li><li>• <code>ip dhcp client idle timer</code> – Configures DHCP Client idle timer</li><li>• <code>ip dhcp client arp-check timer</code> - Configures DHCP client retransmission timeout between arp messages</li><li>• <code>show ip dhcp client fast-access</code> - Displays DHCP fast access details</li></ul>

---

## 22.1.9 ip dhcp client client-id

### Command Objective

This command sets unique identifier to dhcp client identifier. This command advertises the client-id in the DHCP control packets.

The no form of the command resets the dhcp client identifier

### Syntax

```
ip dhcp client client-id {<interface-type> <interface-id>
| vlan <vlan-id (1-4094)> | port-channel <port-channel-id
(1-65535)> | tunnel <tunnel-id (0-128)> | loopback
<interface-id (0-100)> | ascii <string> | hex <string> }
```

```
no ip dhcp client client-id
```

### Parameter Description

- **<interface-type>** - Configures interface type for the DHCP client-id for the specified type of interface. The interface can be:
  - qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
  - gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
  - extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
- **<interface-id>** - Configures interface id for the DHCP client-id for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. For example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided for interface type port-channel. For example: 1 represents port-channel ID.
- **<vlan-id (1-4094)>** - Configures DHCP client-id for the specified VLAN ID. This is a unique value that represents the specific VLAN created. This value ranges between 1 and 4094.
- **<port-channel-id (1-65535)>** - Configures the port to be used by the host to configure the router. This value ranges between 1 and 65535. The port channel identifier can be created or port channel related configuration can done, only if the LA feature is enabled in the switch.
- **tunnel<tunnel-id (0-128)>** - Configures the tunnel identifier. This value ranges between 0 and 128
- **loopback <interface-id (0-100)>** - Configures the loopback identifier. The value ranges between 0 and 100



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	<ul style="list-style-type: none"><li>• <b>ascii &lt;string&gt;</b> - Configures the client-id in ascii format. The client-id is given as a string.</li><li>• <b>hex &lt;string&gt;</b> - Configures the client-id in hexa decimal format. The input type is a string.</li></ul>
<b>Mode</b>	Interface Configuration Mode (Vlan)
<b>Example</b>	<pre>Your Product (config-if)# ip dhcp client client-id gigabitethernet 0/1</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>show ip dhcp client client-id</b> - Displays DHCP client client identifier.</li></ul>

## 22.1.10 ip dhcp client request

**Command Objective** This command sets the dhcp option type to request the server. This is required to send DHCP request to get the tftp server name and Boot file name.

The no form of the command resets the dhcp option type to request the server.

**Syntax** `ip dhcp client request { tftp-server-name | boot-file-name }`

`no ip dhcp client request {tftp-server-name | boot-file-name}`

- Parameter Description**
- **tftp-server-name** - Sends the DHCP requests to get the TFTP server's domain name.
  - **boot-file-name** - Sends the DHCP requests to get the boot File Name.

**Mode** Interface Configuration Mode (Vlan)



This command executes successfully only if the VLAN interfaces and router ports are in BOUND state (that is, IP address is dynamically acquired from DHCP server and an active lease is bound to the interface).

**Example** `Your Product (config-if)# ip dhcp client request tftp-server-name`

- Related Command(s)**
- `show ip dhcp client option` – Displays DHCP client options set by Server

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## 22.1.11 show ip dhcp client fast-access

<b>Command Objective</b>	This command displays DHCP fast access information such as Fast Access Mode status, Dhcp Client Fast Access DiscoverTimeOut, Dhcp Client Fast Access NullStateTimeOut, Dhcp Client Fast Access Arp Check TimeOut values.
<b>Syntax</b>	<code>show ip dhcp client fast-access</code>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show ip dhcp client fast-access DHCP Client Timer Settings ----- Fast Access Mode                               : Enable Dhcp Client Fast Access DiscoverTimeOut : 5 Dhcp Client Fast Access NullStateTimeOut : 1 Dhcp Client Fast Access Arp Check TimeOut : 1</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip dhcp client discovery timer</code> – Configures DHCP Client Discovery timer,</li><li>• <code>ip dhcp client idle timer</code> – Configures DHCP Client idle timer</li><li>• <code>ip dhcp client arp-check timer</code> - Configures DHCP client retransmission timeout between arp messages</li><li>• <code>ip dhcp fast-access</code> - Enables DHCP fast access Mode</li></ul>

## 22.1.12 show ip dhcp client option

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<b>Command Objective</b>	This command displays DHCP client options set by Server which provides the details like interface, interface type, length and value.
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<b>Syntax</b>	<code>show ip dhcp client option</code>
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<b>Mode</b>	Privileged EXEC Mode
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---

<b>Example</b>	<pre>Your Product# show ip dhcp client option Dhcp Client Options Interface  Type  Len  Value -----  - vlan1     66</pre>
----------------	---

---

<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><code>ip dhcp client request</code> – Sets the dhcp option type to request the server</li></ul>
---------------------------	---

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## 22.1.13 show ip dhcp client client-id

<b>Command Objective</b>	This command displays the unique identifier to DHCP client.
<b>Syntax</b>	<code>show ip dhcp client client-id</code>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<code>Your Product# show ip dhcp client client-id</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip dhcp client client-id</code> – Sets unique identifier to dhcp client</li><li>• <code>ip dhcp client request</code> - Sets the dhcp option type to request the server</li></ul>

## 22.2 DHCP Relay

DHCP relay agent is a host or an IP router that allows the DHCP client and DHCP server in different subnets to communicate with each other, so that the DHCP client can obtain its configuration information while booting. The relay agent receives packets from the client, inserts information such as network details, and forwards the modified packets to the server. The server identifies the client's network from the received packets, allocates the IP address accordingly, and sends reply to the relay. The relay strips the information inserted by the server and broadcasts the packets to the client's network.


The list of CLI commands for the configuration of DHCP Relay is as follows:

- [service dhcp-relay](#)
- [ip dhcp server](#)
- [ip helper-address](#)
- [ip dhcp relay information option](#)
- [ip dhcp relay circuit-id option](#)
- [ip dhcp relay circuit id](#)
- [ip dhcp relay remote id](#)
- [debug ip dhcp relay](#)
- [show ip dhcp relay information](#)
- [show dhcp server](#)

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## 22.2.1 service dhcp-relay


<b>Command Objective</b>	<p>This command enables the DHCP relay agent in the switch. DHCP relay agent relays DHCP messages between DHCP client and DHCP server located in different subnets.</p> <p>The no form of the command disables the DHCP relay agent.</p>
<b>Syntax</b>	<pre>service dhcp-relay</pre> <pre>no service dhcp-relay</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	DHCP relay agent is disabled (that is, the switch acts as a DHCP client)
	The DHCP relay agent can be enabled in the switch, only if the DHCP server is disabled in the switch.
<b>Example</b>	<pre>Your product(config)# service dhcp-relay</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>no service dhcp-service</code> – Disables the DHCP server.</li><li>• <code>show ip dhcp relay information</code> - Displays the DHCP relay agent configuration information for a specific VLAN interface or all interfaces in which relay agent details are configured.</li></ul>

## 22.2.2 ip dhcp server

**Command Objective** This command adds the configured IP address to the IP address list created for the DHCP server. The switches or systems having these IP addresses represent the DHCP servers to which the DHCP relay agent can forward the packets that are received from DHCP clients.

The DHCP relay agent broadcasts the received packets to entire network except the network from which the packets are received, if the DHCP server list is empty (that is IP address is configured as 0.0.0.0).

The no form of the command deletes the mentioned IP address from the IP address list.

 The IP address list can contain only 5 IP addresses (that is, only a maximum of 5 DHCP servers can be listed).

**Syntax** `ip dhcp server <ip address>`  
`no ip dhcp server <ip address>`

**Mode** Global Configuration Mode

**Default** DHCP server list

**Example** `Your product(config)# ip dhcp server 12.0.0.1`

- Related Command(s)**
- `show ip dhcp relay information` - Displays the DHCP relay agent configuration information for a specific VLAN interface or all interfaces in which relay agent details are configured.
  - `show dhcp server` - Displays the DHCP servers' IP addresses



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## 22.2.3 ip helper-address

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**Command Objective** This command sets the IP address of the DHCP server. The relay agent starts forwarding the packets (that is, UDP broadcasts including BOOTP) from the client to the specified DHCP server. This command allows to add more than one DHCP server.

This command is a complete standardized implementation of the existing command `ip dhcp server` and operates similar to that of the command `ip dhcp server`. This command also explicitly enables the DHCP relay and disables the DHCP server.

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**Syntax** `ip helper-address <ip address>`

---

**Mode** Interface Configuration Mode (Physical)

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**Default** The IP address is 0.0.0.0 and the status of the DHCP Relay Servers only is disabled.



The relay agent will start forwarding the packets from the client to a specific DHCP server only when the relay agent is in the enabled state.

---

**Example** `Your product(config-if)# ip helper-address 12.0.0.1`


---

**Related Command(s)**

- `show ip dhcp relay information` - Displays the DHCP relay information
- `show dhcp server` - Displays the DHCP Server information

---


## 22.2.4 ip dhcp relay information option

<b>Command Objective</b>	<p>This command enables the DHCP relay agent to perform processing related to DHCP relay agent information option.</p> <p>The options contain a sub-option for agent circuit ID details and another sub-option for agent remote ID details. The processing involves:</p> <ul style="list-style-type: none"><li>• Insertion of DHCP relay information option in DHCP request messages forwarded to a DHCP server from a DHCP client.</li><li>• Examining / removing of DHCP relay information option from DHCP response messages forwarded to the DHCP client from the DHCP server.</li></ul> <p>The no form of the command disables the processing related to DHCP relay agent information option.</p>
<b>Syntax</b>	<pre>ip dhcp relay information option</pre> <pre>no ip dhcp relay information option</pre>
<b>Mode</b>	<p>Global Configuration Mode</p> <p> This command can also be executed in the VLAN Interface Configuration Mode for a code base using industry standard commands.</p>
<b>Default</b>	<p>Processing related to DHCP relay agent information option is disabled.</p>
<b>Example</b>	<pre>Your product(config)# ip dhcp relay information option</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip dhcp relay circuit-id option</code> – Defines the type of information to be present in circuit ID sub-option that is used in the DHCP relay agent information option.</li><li>• <code>show ip dhcp relay information</code> - Displays the DHCP relay agent configuration information for a specific VLAN interface or all interfaces in which relay agent details are configured.</li></ul>

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## 22.2.5 ip dhcp relay circuit-id option

<b>Command Objective</b>	This command defines the type of information to be present in circuit ID sub-option that is used in the DHCP relay agent information option.
<b>Syntax</b>	<code>ip dhcp relay circuit-id option [router-index] [vlanid] [recv-port]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>router-index</code> - Adds information related to router interface indexes in the circuit ID sub-option.</li><li>• <code>vlanid</code> - Adds information related to VLAN IDs in the circuit ID sub-option.</li><li>• <code>recv-port</code> - Adds information related to physical interfaces or LAG ports in the circuit ID sub-option</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	router-index
	The type of information to be present in the circuit ID sub-option can be configured, only if the DHCP relay agent is enabled to perform processing related to DHCP relay agent information option.
<b>Example</b>	<pre>Your product(config)# ip dhcp relay circuit-id option vlanid</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip dhcp relay information option</code> - Enables the DHCP relay agent to perform processing related to DHCP relay agent information option.</li><li>• <code>show ip dhcp relay information</code> - Displays the DHCP relay agent configuration information for a specific VLAN interface or all interfaces in which relay agent details are configured.</li></ul>

## 22.2.6 ip dhcp relay circuit id

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<b>Command Objective</b>	<p>This command configures circuit ID value for an interface.</p> <p>The circuit ID uniquely identifies a circuit over which the incoming DHCP packet is received. In DHCP relay, it is used to identify the correct circuit over which the DHCP responses should be relayed.</p> <p>The configured circuit ID is used in the DHCP relay agent information option to inform the DHCP server about the interface from which DHCP packet is received. The circuit ID is unique for the interfaces and ranges from 1 to 2147483647.</p> <p>The minimum value depends upon the number of interfaces that can be created. For example, if a total of 160 interfaces are allowed to be created in the switch, then the circuit ID value range starts from 161 only. The interfaces include all physical interfaces, port channels and logical L3 interfaces.</p> <p>The no form of the command deletes the circuit ID configuration for the interface (that is, the circuit ID is configured as 0).</p>
<b>Syntax</b>	<pre>ip dhcp relay circuit-id &lt;circuit-id&gt;</pre> <pre>no ip dhcp relay circuit-id</pre>
<b>Mode</b>	Interface Configuration Mode (Vlan / Router Ports)
	This command is available only for the VLAN interfaces and ports that are configured as router ports.
<b>Example</b>	Your product(config-if)# ip dhcp relay circuit-id 1
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>no switchport</code> – Configures the port as a router port.</li><li>• <code>show ip dhcp relay information</code> - Displays the DHCP relay agent configuration information for a specific VLAN interface or all interfaces in which relay agent details are configured.</li></ul>

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## 22.2.7 ip dhcp relay remote id

<b>Command Objective</b>	<p>This command configures remote ID value for an interface.</p> <p>The configured remote ID is used to inform the DHCP client about the remote circuit to which the DHCP packets should be forwarded from the interface. The remote ID is globally unique and an octet string of maximum size of 32. The remote ID should not be same as that of the default value.</p> <p>The no form of the command deletes the remote ID configuration for the interface (that is, the remote ID is set with a string of length zero).</p>
<b>Syntax</b>	<pre>ip dhcp relay remote-id &lt;remote-id name&gt;</pre> <pre>no ip dhcp relay remote-id</pre>
<b>Mode</b>	Interface Configuration Mode (Vlan / Router Ports)
<b>Default</b>	XYZ. This value is internally assigned.
	This command is available only for the VLAN interfaces and ports that are configured as router ports.
<b>Example</b>	<pre>Your product(config-if)# ip dhcp relay remote-id SMIS</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>no switchport</code> – Configures the port as a router port.</li><li>• <code>show ip dhcp relay information</code> - Displays the DHCP relay agent configuration information for a specific VLAN interface or all interfaces in which relay agent details are configured.</li></ul>

## 22.2.8 debug ip dhcp relay

<b>Command Objective</b>	<p>This command enables the tracking of the DHCP relay module operations as per the configured debug levels. The debug statements are generated for the configured trace level.</p> <p>The no form of the command disables the tracking of the DHCP relay module operations. The debug statements are not generated for the configured trace levels.</p>
<b>Syntax</b>	<pre>debug ip dhcp relay {all   errors}  no debug ip dhcp relay {all   errors}</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>all</b> - Generates debug statements for all kind of failure traces.</li><li>• <b>errors</b> - Generates debug statements for trace error code debug messages. These messages are generated for all error events generated.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Default</b>	Tracking of the DHCP relay module operation is disabled.
<b>Example</b>	<pre>Your product# debug ip dhcp relay all</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>show ip dhcp relay information</b> -Displays the DHCP relay agent configuration information for a specific VLAN interface or all interfaces in which relay agent details are configured.</li><li>• <b>show debugging</b> - Displays state of each debugging option</li></ul>

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## 22.2.9 show ip dhcp relay information

<b>Command Objective</b>	<p>This command displays the DHCP relay agent configuration information for a specific VLAN interface or all interfaces in which relay agent details are configured.</p> <p>The information contains status of the DHCP relay, DHCP server IP addresses, status of relay information option, configured debug level and statistics details regarding number of packets affected by relay information option, circuit ID suboption, remote ID suboption, and subnet mask sub option.</p>
<b>Syntax</b>	<pre>show ip dhcp relay information [vlan &lt;vlan-id&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li><b>vlan&lt;vlan-id&gt;</b> - Displays the DHCP relay agent configuration information for the specified VLAN ID. This is a unique value that represents the specific VLAN created. This value ranges between 1 and 4094.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your product# show ip dhcp relay information Dhcp Relay                : Enabled Dhcp Relay Servers only   : Enabled DHCP server 1             : 12.0.0.1 Dhcp Relay RAI option     : Enabled Default Circuit Id information : router-index Debug Level               : 0x1 No of Packets inserted RAI option           : 0 No of Packets inserted circuit ID suboption : 0 No of Packets inserted remote ID suboption  : 0 No of Packets inserted subnet mask suboption : 0 No of Packets dropped                       : 0 No of Packets which did not inserted RAI option : 0 Interface vlan1 Circuit ID : 162 Remote ID : 45</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><b>service dhcp-relay</b> - Enables the DHCP relay agent in the switch.</li><li><b>ip dhcp server</b> - Adds the configured IP address to the IP address list created for the DHCP server.</li></ul>

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- **ip dhcp relay information option** - Enables the DHCP relay agent to perform processing related to DHCP relay agent information option.
  - **ip dhcp relay circuit-id option** - Defines the type of information to be present in circuit ID sub-option that is used in the DHCP relay agent information option.
  - **ip dhcp relay circuit-id** – Configures circuit ID value for an interface.
  - **ip dhcp relay remote-id** – Configures remote ID value for an interface.
  - **debug ip dhcp relay** - Enables the tracking of the DHCP relay module operations as per the configured debug levels
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## 22.2.10 show dhcp server

<b>Command Objective</b>	This command displays the DHCP servers' IP addresses. These addresses denote the PCs or switches that can act as a DHCP server.
<b>Syntax</b>	<code>show dhcp server</code>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your product# show dhcp server DHCP server: 40.0.0.4</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><code>ip dhcp server</code> - Adds the configured IP address to the IP address list created for the DHCP server.</li></ul>

## 22.3 DHCP Server

DHCP server is responsible for dynamically assigning unique IP address and other configuration parameters such as gateway, to interfaces of a DHCP client. The IP address is leased to the interface only for a particular time period as mentioned in the DHCP lease. The interface should renew the DHCP lease once it expires. The DHCP server contains a pool of IP address from which one address is assigned to the interface.


The list of CLI commands for the configuration of DHCP Server is as follows:

- [service dhcp-server](#)
- [service dhcp](#)
- [ip dhcp pool](#)
- [ip dhcp next-server](#)
- [ip dhcp bootfile](#)
- [bootfile config-file](#)
- [ip dhcp](#)
- [ip dhcp option](#)
- [network](#)
- [excluded-address](#)
- [ip dhcp excluded-address](#)
- [domain-name](#)
- [dns-server](#)
- [netbios-name-server](#)
- [netbios-node-type](#)
- [default-router](#)
- [option](#)
- [lease](#)
- [utilization threshold](#)
- [host hardware-type](#)
- [debug ip dhcp server](#)
- [show ip dhcp server information](#)
- [show ip dhcp server pools](#)
- [show ip dhcp server binding](#)
- [show ip dhcp server statistics](#)

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## 22.3.1 service dhcp-server

<b>Command Objective</b>	<p>This command enables the DHCP server in the switch (that is, switch acts as DHCP server). The DHCP server assigns unique IP address and other configuration parameters such as gateway, to interfaces of a DHCP client.</p> <p>The no form of the command disables the DHCP server in the switch.</p>
<b>Syntax</b>	<pre>service dhcp-server</pre> <pre>no service dhcp-server</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	DHCP server is disabled (that is, the switch acts as a DHCP client)
	The DHCP server can be enabled in the switch, only if the DHCP relay agent is disabled in the switch.
<b>Example</b>	<pre>Your product (config)# service dhcp-server</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>no service dhcp-relay</code> - Disables the DHCP relay agent in the switch.</li><li>• <code>show ip dhcp server information</code> - Displays the DHCP server configuration information.</li><li>• <code>show ip dhcp server binding</code> - Displays the DHCP server binding information</li><li>• <code>show ip dhcp server statistics</code> - Displays various DHCP server statistics related information such as number of DHCPDECLINE messages received, DHCP OFFER messages sent and so on.</li></ul>

## 22.3.2 service dhcp

**Command Objective** This command enables the DHCP server in the switch and relay agent features on router which assigns unique IP address and other configuration parameters to interfaces of a DHCP client.

The no form of this command disables the DHCP Server.

This command is a complete standardized implementation of the existing command and operates similar to that of the command service dhcp-server.

**Syntax** `service dhcp`  
`no service dhcp`

**Mode** Global Configuration Mode

**Default** DHCP Server is disabled.



The DHCP server can be enabled in the switch, only if the DHCP relay agent is disabled in the switch.

**Example** `Your product(config)# service dhcp`

**Related Command(s)**

- `no service dhcp-relay` - Disables the DHCP relay agent in the switch.
- `show ip dhcp server information` - Displays the DHCP server configuration information.
- `show ip dhcp server binding` - Displays the DHCP server binding information
- `show ip dhcp server statistics` - Displays various DHCP server statistics related information such as number of DHCPDECLINE messages received, DHCP OFFER messages sent and so on.

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## 22.3.3 ip dhcp pool

<b>Command Objective</b>	<p>This command creates a DHCP server address pool and enters in to the DHCP pool configuration mode in which the pool is customized.</p> <p>The address pool has a range of IP addresses that can be assigned to the DHCP client and also information about client configuration parameters such as domain name. The pool created is identified with a unique ID whose value ranges between 1 and 2147483647.</p> <p>The no form of the command deletes the existing DHCP server address pool.</p>
<b>Syntax</b>	<pre>ip dhcp pool &lt;index (1-2147483647)&gt;  no ip dhcp pool &lt;index (1-2147483647)&gt;</pre>
<b>Mode</b>	Global Configuration Mode
<b>Example</b>	<pre>Your product (config)# ip dhcp pool 1</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>network</b> - Creates a subnet pool that defines a network IP subnet address for the corresponding DHCP address pool and contains IP addresses to be assigned to the DHCP client.</li><li>• <b>excluded-address</b> - Creates an excluded pool that defines a range of IP addresses which needs to be excluded from the created subnet pool.</li><li>• <b>domain-name</b> - Configures the domain name option for the corresponding DHCP server address pool.</li><li>• <b>dns-server</b> - Configures the IP address of a DNS server for the corresponding DHCP server address pool.</li><li>• <b>netbios-name-server</b> - Configures the IP address of a NetBIOS and WINS name server that is available to Microsoft DHCP clients.</li><li>• <b>netbios-node-type</b> - Configures the NetBIOS node type for Microsoft DHCP clients, for the corresponding DHCP server address pool.</li><li>• <b>default-router</b> - Configures the IP address of a default router to which a DHCP client should send packets after booting, for the corresponding DHCP server address pool.</li><li>• <b>option</b> - Configures, for the corresponding DHCP server address pool, the various available DHCP server options with the corresponding specific values.</li></ul>

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- **lease** - Configures, for the corresponding DHCP server, the DHCP lease period for an IP address that is assigned from a DHCP server to a DHCP client.
  - **utilization threshold** - Configures pool utilization threshold value (in percentage) for the corresponding DHCP server address pool.
  - **host hardware-type** - Configures host hardware type and its DHCP option with specific values for the corresponding DHCP server address pool.
  - **show ip dhcp server pools** - Displays the global DHCP option configuration for all DHCP server address pools and configuration information such as utilization threshold, of address pools for which subnet pool is created or host options are configured.
  - **show ip dhcp server statistics** - Displays various DHCP server statistics related information such as number of DHCPDECLINE messages received, DHCPPOFFER messages sent and so on.
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## 22.3.4 ip dhcp next-server

<b>Command Objective</b>	<p>This command sets the IP address of the boot server (that is, TFTP server) from which the initial boot file is to be loaded in a DHCP client. This boot server acts as a secondary server.</p> <p>The no form of the command deletes the boot server details and resets to its default value.</p> <p>The DHCP server is used as the boot server, if no TFTP server is configured as the boot server.</p>
<b>Syntax</b>	<pre>ip dhcp next-server &lt;ip address&gt;</pre> <pre>no ip dhcp next-server</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	0.0.0.0 (No boot server is defined. DHCP server is used as the boot server)
<b>Example</b>	<pre>Your product (config)# ip dhcp next-server 12.0.0.1</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><code>ip dhcp bootfile</code> - Configures the name of the initial boot file to be loaded in a DHCP client.</li><li><code>show ip dhcp server information</code> - Displays the DHCP server configuration information</li></ul>

## 22.3.5 ip dhcp bootfile

<b>Command Objective</b>	<p>This command configures the name of the initial boot file to be loaded in a DHCP client. The file name is a string whose maximum size is 63. The boot file contains the boot image that is used as the operating system for the DHCP client.</p> <p>The no form of the command deletes the boot file name (that is, no file is specified as the initial boot file).</p>
<b>Syntax</b>	<pre>ip dhcp bootfile &lt;bootfile (63)&gt;</pre> <pre>no ip dhcp bootfile</pre>
<b>Mode</b>	Global Configuration Mode
<b>Example</b>	<pre>Your product (config)# ip dhcp bootfile 53</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><code>ip dhcp next-server</code> - Sets the IP address of the boot server (that is, TFTP server) from which the initial boot file is to be loaded.</li><li><code>show ip dhcp server information</code> - Displays the DHCP server configuration information</li></ul>



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## 22.3.6 bootfile config-file

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**Command Objective** This command defines the name of the boot image file that the DHCP client should download during auto install process. The DHCP server passes this file name to the DHCP client. The maximum size of the string is 63.

The no form of this command deletes the specified boot file name and assigns the value of boot file name as None (that is, no file is set as boot image file).

This command is a complete standardized implementation of the existing command and operates similar to that of the command `ip dhcp bootfile`.

---

**Syntax** `bootfile config-file <bootfile (63)>`

`no bootfile config-file`

---

**Mode** Global Configuration Mode

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**Default** None (Null terminated string)

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**Example** `Your product(config)# bootfile config-file boot.img`

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**Related Command(s)**

- `show ip dhcp server information` - Displays the DHCP Server information

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## 22.3.7 ip dhcp

<b>Command Objective</b>	<p>This command enables ICMP echo mechanism or configures offer-reuse timeout for the DHCP server. These parameters are used to control the allocation of IP address to a DHCP client.</p> <p>The no form of the command disables ICMP echo mechanism, resets server offer-reuse time to its default value or removes a bind entry from a server binding table.</p>
<b>Syntax</b>	<pre>ip dhcp { ping packets [&lt;count(0-10)&gt;]   server offer-reuse &lt;timeout (1-120)&gt; }  no ip dhcp { ping packets   server offer-reuse   binding &lt;ip address&gt; }</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>ping packets</b> - Enables / disables ICMP echo mechanism. This mechanism allows the DHCP server to verify the availability of an IP address before assigning it to a DHCP client. DHCP server sends ping packets to the IP address that is intended to be assigned for the DHCP client. If the ping operation fails, DHCP server assumes that the address is not in use and assigns the address to the requesting DHCP client</li><li>• <b>&lt;count(0-10)&gt;</b> - Configures the number of ping packets to be sent from the DHCP server to the pool address before assigning the address to a requesting client. The pinging of pool addresses is disabled, if the count value is set as 0. This value ranges from 0 to 10. This feature has been included to adhere to the Industry Standard CLI syntax. This feature is currently not supported.</li><li>• <b>server offer-reuse</b> - Configures the amount of time (in seconds), the DHCP server entity should wait for the DHCP REQUEST from the DHCP client before reusing the lease offer for other DHCP client. This value ranges between 1 and 120 seconds.</li><li>• <b>binding</b> - Deletes the specified IP address entry from the server binding table. This frees the IP address allocated to a DHCP client, so that the IP address can be allocated for another DHCP client.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	<ul style="list-style-type: none"><li>• ping packets - ICMP echo mechanism feature is disabled.</li><li>• server offer-reuse - 5</li></ul>
<b>Example</b>	<pre>Your product (config)# ip dhcp ping packets</pre>

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## Related Command(s)

- **show ip dhcp server information** - Displays the DHCP server configuration information.
  - **show ip dhcp server binding** - Displays the DHCP server binding information.
  - **show ip dhcp server statistics** - Displays various DHCP server statistics related information such as number of DHCPDECLINE messages received, DHCPPOFFER messages sent and so on.
-

## 22.3.8 ip dhcp option

<b>Command Objective</b>	<p>This command sets the DHCP Server options. This command globally configures the various available DHCP server options with the corresponding specific values. These values can be an ASCII string, hexadecimal string or IP address. These global options are applicable for all DHCP server address pools.</p> <p>The no form of the command deletes the existing DHCP server option.</p>
<b>Syntax</b>	<pre>ip dhcp option &lt;code (1-2147483647)&gt; { ascii &lt;string&gt;   hex &lt;Hex String&gt;   ip &lt;address&gt; }  no ip dhcp option &lt;code (1-2147483647)&gt;</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;code (1-2147483647)&gt;</b> - Configures the unique DHCP option code that represents a specific DHCP option used in a DHCP OFFER message in response to a DHCP DISCOVER message. This value ranges from 1 to 2147483647.</li><li>• <b>ascii&lt;string&gt;</b> - Configures the ASCII value to be set for the corresponding option code that accepts ASCII string. This value is a character string that should contain only characters from NVT ASCII character set.</li><li>• <b>hex&lt;Hex String&gt;</b> - Configures the hexadecimal value to be set for the corresponding option code that accepts hexadecimal string.</li><li>• <b>ip&lt;address&gt;</b> - Configures the unicast IP address to be set for the corresponding option code that accepts IP address.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Example</b>	<pre>Your product(config)# ip dhcp option 19 hex d</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>show ip dhcp server pools</b> - Displays global DHCP option configuration for all DHCP server address pools and configuration information such as utilization threshold, of address pools for which subnet pool is created or host options are configured.</li></ul>

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## 22.3.9 network

<b>Command Objective</b>	<p>This command creates a subnet pool that defines a network IP subnet address for the corresponding DHCP address pool and contains IP addresses to be assigned to the DHCP client.</p> <p>The no form of the command deletes the created subnet pool.</p>
<b>Syntax</b>	<pre>network &lt;start- IP&gt; [ { &lt;mask&gt;   / &lt;prefix-length (1-31)&gt; } ] [end ip]</pre> <pre>no network</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;start-IP&gt;</b> - Configures the IP subnet address for the DHCP pool. The addresses within the specified network subnet are assigned to the DHCP client, if no restriction is applied. For example: The value is configured as 20.0.0.0, then any one of the address within the range from 20.0.0.1 to 20.255.255.254 can be assigned to the DHCP client if no other limitations such as end IP address, are set. This value should be unique (that is, one subnet address can be assigned only for one DHCP address pool).</li><li>• <b>&lt;mask&gt;</b> - Configures the subnet mask for the network IP address. This is a 32-bit number which is used to divide the IP address into network address and host address. This value is used to automatically calculate the end IP address for the pool. For example: The value 254.0.0.0 represents that the end IP address is 21.255.255.254, if the network subnet is set as 20.0.0.0.</li><li>• <b>&lt;prefix-length (1-31)&gt;</b> - Configures the number of high-order bits in the IP address. These bits are common among all hosts within a network. This value should be preceded by a slash (/) with space before and after the slash. This value is used to automatically calculate the end IP address for the pool and set the mask for the subnet. For example: value 20.0.0.0 / 6 represents that the end ip address is 23.255.255.254 and the mask is 252.0.0.0.</li><li>• <b>&lt;end ip&gt;</b> - Configures the end IP address for the network IP subnet set for the DHCP address pool. This value restricts the IP addresses that can be assigned to the DHCP client. This value is used to manually set the end IP address. This value overrides the end IP address calculated automatically using the mask or prefix-length.</li></ul>
<b>Mode</b>	DHCP Pool Configuration Mode
<b>Default</b>	<ul style="list-style-type: none"><li>• mask - 255.0.0.0</li><li>• end ip - Represents the last possible subnet address. For example: If network subnet address is mentioned as 20.0.0.0, then end IP address</li></ul>

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would be 20.255.255.254.

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**Example**

```
Your product(dhcp-config)# network 20.0.0.0 255.0.0.0  
20.0.0.50
```

---


**Related Command(s)**

- **ip dhcp pool** - Creates a DHCP server address pool and enters in to the DHCP pool configuration mode in which the pool is customized.
  - **excluded-address** - Creates an excluded pool that defines a range of IP addresses which needs to be excluded from the created subnet pool.
  - **domain-name** - Configures the domain name option for the corresponding DHCP server address pool.
  - **dns-server** - Configures the IP address of a DNS server for the corresponding DHCP server address pool.
  - **netbios-name-server** - Configures the IP address of a NetBIOS and WINS name server that is available to Microsoft DHCP clients.
  - **netbios-node-type** - Configures the NetBIOS node type for Microsoft DHCP clients, for the corresponding DHCP server address pool.
  - **netbios-node-type** - Configures the IP address of a default router to which a DHCP client should send packets after booting, for the corresponding DHCP server address pool.
  - **option** - Configures, for the corresponding DHCP server address pool, the various available DHCP server options with the corresponding specific values.
  - **Lease** - Configures, for the corresponding DHCP server, the DHCP lease period for an IP address that is assigned from a DHCP server to a DHCP client.
  - **utilization threshold** - Configures pool utilization threshold value (in percentage) for the corresponding DHCP server address pool.
  - **show ip dhcp server pools** - Displays the global DHCP option configuration for all DHCP server address pools and configuration information such as utilization threshold, of address pools for which subnet pool is created or host options are configured.
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## 22.3.10 excluded-address

<b>Command Objective</b>	<p>This command creates an excluded pool that defines a range of IP addresses which needs to be excluded from the created subnet pool. That is, the IP addresses in this range including start and end IP address of the excluded pool are not assigned to any DHCP client.</p> <p>The no form of the command deletes the created excluded pool. The same start IP address and end IP address of the already created excluded pool should be provided while executing the no form of the command.</p>
<b>Syntax</b>	<pre>excluded-address &lt;low-address&gt; &lt;high-address&gt;</pre> <pre>no excluded-address &lt;low-address&gt; [&lt;high-address&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;low-address&gt;</b> - Sets the start IP address for an excluded pool. This address denotes the first IP address of a range of IP addresses which needs to be excluded from the created subnet pool. This IP address should be:<ul style="list-style-type: none"><li>– lower than the end IP address, and</li><li>– in the same network of the subnet pool's start IP address.</li></ul></li><li>• <b>&lt;high-address&gt;</b> - Sets the end IP address for an excluded pool. This address denotes the last IP address of a range of IP addresses which needs to be excluded from the created subnet pool. This IP address should be:<ul style="list-style-type: none"><li>– high than the start IP address, and</li><li>– within or equal to the subnet pool's end IP address.</li></ul></li></ul>
<b>Mode</b>	DHCP Pool Configuration Mode
	This command is executed successfully, only if a subnet pool is already created for the DHCP address pool.
<b>Example</b>	<pre>Your product(dhcp-config)# excluded-address 20.0.0.1 20.0.0.30</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>ip dhcp pool</b> - Creates a DHCP server address pool and enters in to the DHCP pool configuration mode in which the pool is customized.</li><li>• <b>network</b> - Creates a subnet pool that defines a network IP subnet address for the corresponding DHCP address pool and contains IP addresses to be assigned to the DHCP client.</li><li>• <b>show ip dhcp server pools</b> - Displays the global DHCP option configuration for all DHCP server address pools.</li></ul>

## 22.3.11 ip dhcp excluded-address

<b>Command Objective</b>	<p>This command creates an excluded pool to prevent DHCP server from assigning certain addresses to DHCP clients. The no form of the command deletes the excluded pool.</p> <p>This command is a complete standardized implementation of the existing command and operates similar to that of the command excluded-address. This command is used to exclude a single IP address or a range of IP addresses.</p>
<b>Syntax</b>	<pre>ip dhcp excluded-address &lt;low-address&gt; [&lt;high-address&gt;] no ip dhcp excluded-address &lt;low-address&gt; [high-address]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>low-address</b> - Configures the excluded IP address, or first IP address in an excluded address range</li><li>• <b>high-address</b> - Configures the last IP address in the excluded address range</li></ul>
<b>Mode</b>	Global Configuration Mode
	<p>Subnet pool should have been created before creating an excluded pool. This excluded pool should be within the range of the created subnet pool.</p> <p>For example, the excluded pool 20.0.0.20 – 20.0.0.30 created using this command is within the already created subnet pool 20.0.0.0 – 20.0.0.100.</p>
<b>Example</b>	<pre>Your product(config)# ip dhcp excluded-address 20.0.0.20 20.0.0.30</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>ip dhcp pool</b> - Creates a DHCP Server address pool and places the user in the DHCP pool configuration mode</li><li>• <b>network</b> - Sets the network IP and mask in DHCP Server configuration parameters</li><li>• <b>service dhcp-server</b> - Enables the DHCP Server</li><li>• <b>show ip dhcp server information</b> - Displays the server information</li><li>• <b>show ip dhcp server pools</b> - Displays the DHCP Server pools</li><li>• <b>show ip dhcp server binding</b> - Displays the DHCP Server binding information</li></ul>



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- `show ip dhcp server statistics` - Displays the DHCP Server statistics
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## 22.3.12 domain-name

**Command Objective** This command configures the domain name option for the corresponding DHCP server address pool. A DHCP client uses this domain name while resolving host names through a domain name system. The DHCP option code is 15. This value is a string whose maximum size is 63.

The no form of the command deletes the domain name option configuration for the DHCP server address pool. The domain name option configuration is deleted, if the no form of the network command is executed successfully.

**Syntax** `domain-name <domain (63)>`  
`no domain-name`

**Mode** DHCP Pool Configuration Mode



The domain name configuration takes effect only after creating a subnet pool for a DHCP server address pool.

**Example** `Your product(dhcp-config)# domain-name Aricent`

**Related Command(s)**

- `ip dhcp pool` - Creates a DHCP server address pool and enters in to the DHCP pool configuration mode in which the pool is customized.
- `network` - Creates a subnet pool that defines a network IP subnet address for the corresponding DHCP address pool and contains IP addresses to be assigned to the DHCP client.
- `show ip dhcp server pools` - Displays the global DHCP option configuration for all DHCP server address pools and configuration information such as utilization threshold, of address pools for which subnet pool is created or host options are configured.

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## 22.3.13 dns-server

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**Command Objective** This command configures the IP address of a DNS server for the corresponding DHCP server address pool. The client correlates the DNS IP address with the host name. The DNS server is used to translate domain names and hostnames into corresponding IP addresses.

The no form of the command deletes the DNS server IP address option configuration for the DHCP server address pool. The DNS server IP address option configuration is deleted, if the no form of the network command is executed successfully.

---

**Syntax** `dns-server <ip address>`

`no dns-server`

---

**Mode** DHCP Pool Configuration Mode



The DNS server IP address configuration takes effect only after creating a subnet pool for a DHCP server address pool.

---


**Example** `Your product(dhcp-config)# dns-server 20.0.0.1`

---

**Related Command(s)**


- `ip dhcp pool` - Creates a DHCP server address pool and enters in to the DHCP pool configuration mode in which the pool is customized.
  - `network` - Creates a subnet pool that defines a network IP subnet address for the corresponding DHCP address pool and contains IP addresses to be assigned to the DHCP client.
  - `show ip dhcp server pools` - Displays the global DHCP option configuration for all DHCP server address pools and configuration information such as utilization threshold, of address pools for which subnet pool is created or host options are configured.
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## 22.3.14 netbios-name-server

<b>Command Objective</b>	<p>This command configures, for the corresponding DHCP server address pool, the IP address of a NetBIOS (Network Basic Input / Output System) and WINS (Windows Internet Naming Service) name server that is available to Microsoft DHCP clients.</p> <p>The no form of the command deletes the NetBIOS and WINS name server IP address configuration for the DHCP server address pool. The NetBIOS WINS name server option configuration is deleted, if the no form of the network command is executed successfully.</p> <p>The NetBIOS name server provides the following three distinct services:</p> <ol style="list-style-type: none"><li>1. Name service for name registration and resolution</li><li>2. Session service for connection oriented communication</li><li>3. Datagram distribution service for connectionless communication</li></ol>
<b>Syntax</b>	<pre>netbios-name-server &lt;ip address&gt;</pre> <pre>no netbios-name-server</pre>
<b>Mode</b>	DHCP Pool Configuration Mode
	The NetBIOS WINS name server configuration takes effect only after creating a subnet pool for a DHCP server address pool.
<b>Example</b>	<pre>Your product(dhcp-config)# netbios-name-server 20.0.0.3</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>ip dhcp pool</b> - Creates a DHCP server address pool and enters in to the DHCP pool configuration mode in which the pool is customized.</li><li>• <b>network</b> - Creates a subnet pool that defines a network IP subnet address for the corresponding DHCP address pool and contains IP addresses to be assigned to the DHCP client.</li><li>• <b>show ip dhco server pools</b> - Displays the global DHCP option configuration for all DHCP server address pools and configuration information such as utilization threshold, of address pools for which subnet pool is created or host options are configured.</li></ul>

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## 22.3.15 netbios-node-type

<b>Command Objective</b>	<p>This command configures the NetBIOS node type for Microsoft DHCP clients, for the corresponding DHCP server address pool. The node type denotes the method used to register and resolve NetBIOS names to IP addresses.</p> <p>The no form of the command deletes the NetBIOS node type option configuration for the DHCP server address pool.</p>
<b>Syntax</b>	<pre>netbios-node-type { &lt;0-FF&gt;   b-node   h-node   m-node   p-node }  no netbios-node-type</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;0-FF&gt;</b> - Allows NetBIOS over TCP/IP clients. This value ranges from 0 to 255.</li><li>• <b>b-node</b> - Configures the DHCP server address pool to broadcast IP messages for registering and resolving NetBIOS names to IP addresses. The node type value is set as 1.</li><li>• <b>h-node</b> - Configures the DHCP server address pool to initially query name server and subsequently broadcast IP messages for registering and resolving NetBIOS names to IP addresses. The node type value is set as 8. This node type is the best option for all conditions.</li><li>• <b>m-node</b> - Configures the DHCP server address pool to initially broadcast IP message and then query name server for registering and resolving NetBIOS names to IP addresses. The node type value is set as 4.</li><li>• <b>p-node</b> - Configures the DHCP server address pool to have point-to-point communication with a NetBIOS name server for registering and resolving NetBIOS names to IP addresses. The node type value is set as 2.</li></ul>
<b>Mode</b>	DHCP Pool Configuration Mode
	The NetBIOS node type configuration takes effect only after creating a subnet pool for a DHCP server address pool.
<b>Example</b>	<pre>Your product(dhcp-config)# netbios-node-type h-node</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>ip dhcp pool</b> - Creates a DHCP server address pool and enters in to the DHCP pool configuration mode in which the pool is customized.</li><li>• <b>network</b> - Creates a subnet pool that defines a network IP subnet address for the corresponding DHCP address pool and contains IP addresses to be assigned to the DHCP client.</li></ul>

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- **show ip dhcp server pools** - Displays the global DHCP option configuration for all DHCP server address pools and configuration information such as utilization threshold, of address pools for which subnet pool is created or host options are configured.
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## 22.3.16 default-router

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**Command Objective** This command configures the IP address of a default router to which a DHCP client should send packets after booting, for the corresponding DHCP server address pool.

The no form of the command deletes the default router IP address configuration for the DHCP server address pool. The default router IP address configuration is deleted, if the no form of the network command is executed successfully.

---

**Syntax** `default-router <ip address>`  
`no default-router`

---

**Mode** DHCP Pool Configuration Mode



- The configured IP address of the default router should be on the same subnet of the DHCP client.
- The default router IP address configuration takes effect only after creating a subnet pool for a DHCP server address pool.

---

**Example** `Your product(dhcp-config)# default-router 10.23.2.99`


---

**Related Command(s)**

- `ip dhcp pool` - Creates a DHCP server address pool and enters in to the DHCP pool configuration mode in which the pool is customized.
- `network` - Creates a subnet pool that defines a network IP subnet address for the corresponding DHCP address pool and contains IP addresses to be assigned to the DHCP client.
- `show ip dhcp server pools` - Displays the global DHCP option configuration for all DHCP server address pools and configuration information such as utilization threshold, of address pools for which subnet pool is created or host options are configured.

---

## 22.3.17 option

<b>Command Objective</b>	<p>This command configures, for the corresponding DHCP server address pool, the various available DHCP server options with the corresponding specific values. These values can be an ASCII string, hexadecimal string or IP address.</p> <p>The no form of the command deletes the DHCP server option for the DHCP server address pool. The DHCP server option configuration is deleted, if the no form of the network command is executed successfully.</p>
<b>Syntax</b>	<pre>option &lt;code (1-2147483647)&gt; { ascii &lt;string&gt;   hex &lt;Hex String&gt;   ip &lt;address&gt; }  no option &lt;code (1-2147483647)&gt;</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;code (1-2147483647)&gt;</b> - Configures the unique DHCP option code that represents a specific DHCP option used in a DHCP OFFER message on response to a DHCP DISCOVER message. This value ranges from 1 to 2147483647.</li><li>• <b>ascii&lt;string&gt;</b> - Configures the ASCII value to be set for the corresponding option code that accepts ASCII string. This value is a character string that should contain only characters from NVT ASCII character set.</li><li>• <b>hex&lt;Hex String&gt;</b> - Configures the hexadecimal value to be set for the corresponding option code that accepts hexadecimal string.</li><li>• <b>ip&lt;address&gt;</b> - Configures the unicast IP address to be set for the corresponding option code that accepts IP address.</li></ul>
<b>Mode</b>	DHCP Pool Configuration Mode
<b>Default</b>	Option code - 1
	The DHCP server options configuration takes effect only after creating a subnet pool for a DHCP server address pool.
<b>Example</b>	<pre>Your product(dhcp-config) # option 19 hex f</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>ip dhcp pool</b> - Creates a DHCP server address pool and enters in to the DHCP pool configuration mode in which the pool is customized.</li><li>• <b>network</b> - Creates a subnet pool that defines a network IP subnet address for the corresponding DHCP address pool and contains IP addresses to be assigned to the DHCP client.</li></ul>



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- **show ip dhcp server pools** - Displays the global DHCP option configuration for all DHCP server address pools and configuration information such as utilization threshold, of address pools for which subnet pool is created or host options are configured.
-

## 22.3.18 lease

**Command Objective** This command configures, for the corresponding DHCP server, the DHCP lease period for an IP address that is assigned from a DHCP server to a DHCP client.

The DHCP lease period represents the time interval (in seconds) till which the DHCP client can use the assigned IP address. The time interval is internally calculated in seconds based on the number of days, hours and minutes configuration.

The no form of the command resets the DHCP lease period to its default value for the DHCP server address pool. The DHCP lease period configuration is deleted and reset, if the no form of the network command is executed successfully.

**Syntax**

```
lease { <days (0-365)> [<hours (0-23)> [<minutes (1-59)>]]  
| infinite }  
  
no lease
```

**Parameter Description**

- **<days (0-365)>** - Configures the number of days that is used to calculate the DHCP lease period. The period also depends on the configured number of hours and minutes. This value ranges from 0 to 365. The value 0 is valid only if either number of hours or minutes is configured with any value other than 0.
- **<hours (0-23)>** - Configures the number of hours that is used to calculate the DHCP lease period. The period also depends on the configured number of days and minutes. This value ranges from 0 to 23. The value 0 is valid only if either number of days or minutes is configured with any value other than 0.
- **<minutes (1-59)>** - Configures the number of minutes that is used to calculate the DHCP lease period. The period also depends on the configured number of days and hours. This value ranges from 1 to 59.
- **infinite** - Configures the DHCP lease period as 2147483647 seconds.

**Mode** DHCP Pool Configuration Mode

**Default** 3600 seconds (1 hour)



The DHCP lease period configuration takes effect only after creating a subnet pool for a DHCP server address pool.

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**Example**                      `Your product(dhcp-config)# lease 1`

---

**Related Command(s)**

- `ip dhcp pool` - Creates a DHCP server address pool and enters in to the DHCP pool configuration mode in which the pool is customized.
  - `network` - Creates a subnet pool that defines a network IP subnet address for the corresponding DHCP address pool and contains IP addresses to be assigned to the DHCP client.
  - `show ip dhcp server pools` - Displays the global DHCP option configuration for all DHCP server address pools and configuration information such as utilization threshold, of address pools for which subnet pool is created or host options are configured.
-

## 22.3.19 utilization threshold

<b>Command Objective</b>	<p>This command configures pool utilization threshold value (in percentage) for the corresponding DHCP server address pool.</p> <p>The no form of the command resets the pool utilization threshold to its default value for the DHCP server address pool.</p> <p>If the pool utilization exceeds the configured threshold value, a syslog event and an SNMP trap message are generated. The threshold value ranges from 0 to 100 percentage.</p>
<b>Syntax</b>	<pre>utilization threshold { &lt;integer (0-100)&gt; }  no utilization threshold</pre>
<b>Mode</b>	DHCP Pool Configuration Mode
<b>Default</b>	75 percent
	The pool utilization threshold configuration takes effect only after creating a subnet pool for a DHCP server address pool.
<b>Example</b>	<pre>Your product(dhcp-config)# utilization threshold 76</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip dhcp pool</code> - Creates a DHCP server address pool and enters in to the DHCP pool configuration mode in which the pool is customized.</li><li>• <code>network</code> - Creates a subnet pool that defines a network IP subnet address for the corresponding DHCP address pool and contains IP addresses to be assigned to the DHCP client.</li><li>• <code>show ip dhcp server pools</code> - Displays the global DHCP option configuration for all DHCP server address pools and configuration information such as utilization threshold, of address pools for which subnet pool is created or host options are configured.</li></ul>

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## 22.3.20 host hardware-type

<b>Command Objective</b>	<p>This command configures host hardware type and its DHCP option with specific values for the corresponding DHCP server address pool.</p> <p>The no form of the command deletes the hardware type and its DHCP option.</p>
<b>Syntax</b>	<pre>host hardware-type &lt;type (1-2147483647)&gt; client-identifier &lt;mac-address&gt; { ip &lt;address&gt;   option &lt;code (1- 2147483647)&gt; { ascii &lt;string&gt;   hex &lt;Hex String&gt;   ip &lt;address&gt; }}  no host hardware-type &lt;host-hardware-type (1-2147483647)&gt; client-identifier &lt;client-mac-address&gt; [{ ip   option &lt;code (1-2147483647)&gt; }]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;type (1-2147483647)&gt;</b> - Configures the host hardware type for which the host address and the DHCP options needs to be configured. This value ranges from 1 to 2147483647. Only the value 1 is supported, which represents that the hardware type is Ethernet.</li><li>• <b>client identifier&lt;mac-address&gt;</b> - Configures the DHCP client identifier in a host declaration so that a host record can be found using this client identifier. The client identifier represents the physical address (MAC address) of a network card.</li><li>• <b>ip &lt;address&gt;</b> - Configures the IPv4 address for the DHCP host.</li><li>• <b>option &lt;code (1-2147483647)&gt;</b>- Configures the unique DHCP option code that represents a specific DHCP option used in a DHCP OFFER message on response to a DHCP DISCOVER message. This value ranges from 1 to 2147483647.<ul style="list-style-type: none"><li>– <b>ascii&lt;string&gt;</b> - Configures the ASCII value to be set for the corresponding option code that accepts ASCII string. This value is a character string that should contain only characters from NVT ASCII character set.</li><li>– <b>hex&lt;Hex String&gt;</b> - Configures the hexadecimal value to be set for the corresponding option code that accepts hexadecimal string.</li><li>– <b>ip &lt;address&gt;</b> - Configures the unicast IP address to be set for the corresponding option code that accepts IP address.</li></ul></li></ul>
<b>Mode</b>	DHCP Pool Configuration Mode
<b>Example</b>	<pre>Your product(dhcp-config)# host hardware-type 1 client- identifier 00:11:22:33:44:55 option 1 ip 10.0.0.1</pre>

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## Related Command(s)

- **ip dhcp pool** - Creates a DHCP server address pool and enters in to the DHCP pool configuration mode in which the pool is customized.
  - **show ip dhcp server pools** - Displays the global DHCP option configuration for all DHCP server address pools and configuration information such as utilization threshold, of address pools for which subnet pool is created or host options are configured.
  - **show ip dhcp server binding** - Displays the DHCP server binding information
-

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## 22.3.21 debug ip dhcp server

<b>Command Objective</b>	<p>This command enables the tracking of the DHCP server operations as per the configured debug levels. The debug statements are generated for the configured trace levels.</p> <p>The no form of the command disables the tracking of the DHCP server operations. The debug statements are not generated for the configured trace levels.</p> <p>This command allows combination of debug levels to be configured (that is, more than one level of trace can be enabled or disabled). The debug levels are configured one after the other and not in single execution of the command.</p>
<b>Syntax</b>	<pre>debug ip dhcp server { all   events   packets   errors   bind   linkage }  no debug ip dhcp server { all   events   packets   errors   bind   linkage }</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>all</b> - Generates debug statements for all kind of failure traces.</li><li>• <b>events</b> - Generates debug statements for DHCP server events that provide DHCP server service status. The DHCP server events are generated when any of packets are sent successfully or when an ACK is received.</li><li>• <b>packets</b> - Generates debug statements for packet related messages. These messages are generated for all events generated during processing of packets.</li><li>• <b>errors</b> - Generates debug statements for trace error code debug messages. These messages are generated for all error events generated.</li><li>• <b>bind</b> - Generates debug statements for trace bind messages. These messages are generated when a DHCP ACK is received.</li><li>• <b>linkage</b> - Generates debug statements for database linkage messages. This feature has been included to adhere to the Industry Standard CLI syntax. This feature is currently not supported.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Default</b>	Tracking of the DHCP server operations is disabled
<b>Example</b>	<pre>Your product# debug ip dhcp server all</pre>

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## Related Command(s)

- `show ip dhcp server information` - Displays the DHCP server configuration information.
  - `show debugging` - Displays state of each debugging option
-



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## 22.3.22 show ip dhcp server information

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**Command Objective** This command displays the DHCP server configuration information.

The information contains status of DHCP server, ICMP echo mechanism status, debug level, boot server IP address, boot file name and server offer reuse time.

---

**Syntax** `show ip dhcp server information`

---

**Mode** Privileged EXEC Mode

---

**Example** `Your product# show ip dhcp server information`

```
DHCP server status           : Enable
Send Ping Packets           : Disable
Debug level                  : None
Server Address Reuse Timeout : 5 secs
Next Server Address         : 0.0.0.0
Boot file name               : None
```

---

**Related Command(s)**

- `service dhcp-server` - Enables the DHCP server in the switch (that is, switch acts as DHCP server).
- `ip dhcp next-server` - Sets the IP address of the boot server (that is, TFTP server) from which the initial boot file is to be loaded.
- `ip dhcp bootfile` - Configures the name of the initial boot file to be loaded in a DHCP client.
- `ip dhcp` - Enables ICMP echo mechanism or configures offer-reuse timeout for the DHCP server.
- `debug ip dhcp server` - Enables the tracking of the DHCP server operations as per the configured debug levels.

---

## 22.3.23 show ip dhcp server pools

<b>Command Objective</b>	This command displays the global DHCP option configuration for all DHCP server address pools and configuration information such as utilization threshold, of address pools for which subnet pool is created or host options are configured.
<b>Syntax</b>	<code>show ip dhcp server pools</code>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your product# show ip dhcp server pools  Global Options ----- Code       :    19, Value       : 0 Pool Id    : 1  -----  Subnet                               : 20.0.0.0 Subnet Mask                            : 255.0.0.0 Lease time                             : 86400 secs Utilization threshold                  : 76% Start Ip                               : 20.0.0.1 End Ip                                  : 20.0.0.50 Exclude Address Start IP               : 20.0.0.1 Exclude Address End IP                 : 20.0.0.30 Subnet Options ----- Code      :    1, Value       : 255.0.0.0 Code      :    3, Value       : 10.23.2.99 Code      :    6, Value       : 20.0.0.1 Code      :   15, Value       : SMIS Code      :   19, Value       : 0 Code      :   44, Value       : 20.0.0.3 Code      :   46, Value       : 8 Host Options -----</pre>

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---

Hardware type	:	1
Client Identifier	:	00:11:22:33:44:55
Code	:	1, Value
	:	10.0.0.1

---

## Related Command(s)

- **ip dhcp option** - Configures globally the various available DHCP server options with the corresponding specific values
  - **ip dhcp pool** - Creates a DHCP server address pool and enters in to the DHCP pool configuration mode in which the pool is customized.
  - **network** - Creates a subnet pool that defines a network IP subnet address for the corresponding DHCP address pool and contains IP addresses to be assigned to the DHCP client.
  - **excluded-address** - Creates an excluded pool that defines a range of IP addresses which needs to be excluded from the created subnet pool.
  - **domain-name** - Configures the domain name option for the corresponding DHCP server address pool.
  - **dns-server** - Configures the IP address of a DNS server for the corresponding DHCP server address pool.
  - **netbios-name-server** - Configures the IP address of a NetBIOS and WINS name server that is available to Microsoft DHCP clients.
  - **netbios-node-type** - Configures the NetBIOS node type for Microsoft DHCP clients, for the corresponding DHCP server address pool.
  - **default-router** - Configures the IP address of a default router to which a DHCP client should send packets after booting, for the corresponding DHCP server address pool.
  - **option** - Configures, for the corresponding DHCP server address pool, the various available DHCP server options with the corresponding specific values.
  - **lease** - Configures, for the corresponding DHCP server, the DHCP lease period for an IP address that is assigned from a DHCP server to a DHCP client.
  - **utilization threshold** - Configures pool utilization threshold value (in percentage) for the corresponding DHCP server address pool.
  - **host hardware-type** - Configures host hardware type and its DHCP option with specific values for the corresponding DHCP server address pool.
  - **show ip dhcp server statistics** - Displays various DHCP server statistics related information such as number of DHCPDECLINE messages received, DHCPOFFER messages sent and so on.
-

## 22.3.24 show ip dhcp server binding

**Command Objective** This command displays the DHCP server binding information.

A DHCP binding is created when a DHCP server assigns an IP address to a DHCP client. The information contains the allocated IP address, host hardware type, host hardware address, binding state and expiry time of the allocated DHCP lease.

**Syntax** `show ip dhcp server binding`

**Mode** Privileged EXEC Mode



The DHCP server binding information is displayed, only if the DHCP server is enabled and the DHCP binding is created.

**Example**

```
Your product# show ip dhcp server binding
Ip          Hw          Hw          Binding  Expire
Address    Type        Address      State    Time
-----    -
12.0.0.2   Ethernet  00:02:02:03: 4:01  Assigned May 12
13:22:41   2009
```

- Related Command(s)**
- `service dhcp-server` - Enables the DHCP server in the switch.
  - `ip dhcp` - Enables ICMP echo mechanism or configures offer-reuse timeout for the DHCP server.
  - `host hardware-type` - Configures host hardware type and its DHCP option with specific values for the corresponding DHCP server address pool.

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## 22.3.25 show ip dhcp server statistics

<b>Command Objective</b>	This command displays various DHCP server statistics related information such as number of DHCPDECLINE messages received, DHCPPOFFER messages sent and so on.
<b>Syntax</b>	<code>show ip dhcp server statistics</code>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your product# show ip dhcp server statistics Address pools : 2 Message                Received -----                - DHCPDISCOVER           6 DHCPREQUEST            2 DHCPDECLINE            0 DHCPRELEASE            0 DHCPINFORM             0 Message                Sent -----                - DHCPPOFFER             6 DHCPACK                2 DHCPNAK                0</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>service dhcp-server</code> - Enables the DHCP server in the switch.</li><li>• <code>ip dhcp pool</code> - Creates a DHCP server address pool and enters in to the DHCP pool configuration mode in which the pool is customized.</li><li>• <code>ip dhcp</code> - Enables ICMP echo mechanism or configures offer-reuse timeout for the DHCP server.</li><li>• <code>show ip dhcp server pools</code> - Displays the global DHCP option configuration for all DHCP server address pools and configuration information such as utilization threshold, of address pools for which subnet pool is created or host options are configured.</li></ul>

## Chapter 23

### IGMP Snooping

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Internet Group Multicast Protocol, (IGMP) is the protocol, a host uses to inform a router when it joins (or leaves) an Internet multicast group. IGMP is only used on a local network; a router must use another multicast routing protocol to inform other routers of group membership. IGMP Snooping (IGS) is a feature that allows the switch to “listen in” on the IGMP conversation between hosts and routers. In IGS, a host computer uses IGMP to inform a router that it intends to listen to a specific multicast address. If another computer snoops such packets, it can learn the multicast sessions to which other computers on the local network are listening. The multicast packet transfer happens only between the source and the destination computers. Broadcasting of packets is avoided. IGMP snooping significantly reduces traffic from streaming media and other bandwidth-intensive IP multicast applications.

The list of CLI commands for the configuration of IGS is common to both Single Instance and Multiple Instance except for a difference in the prompt that appears for the Switch with Multiple Instance support.

The prompt for the Global Configuration Mode is,

**Your Product(config)#**

The list of CLI commands for the configuration of IGS is as follows:

- [ip igmp snooping](#)
- [ip igmp snooping proxy-reporting](#)
- [snooping multicast-forwarding-mode](#)
- [ip igmp snooping mrouter-time-out](#)
- [ip igmp querier-timeout](#)
- [ip igmp snooping port-purge-interval](#)

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- [ip igmp snooping source-only learning age-timer](#)
- [ip igmp snooping report-suppression interval](#)
- [ip igmp snooping retry-count](#)
- [ip igmp snooping group-query-interval](#)
- [ip igmp snooping report-forward](#)
- [ip igmp snooping query-forward](#)
- [ip igmp snooping version](#)
- [ip igmp snooping fast-leave](#)
- [ip igmp snooping vlan - immediate leave](#)
- [ip igmp snooping querier](#)
- [ip igmp snooping query-interval](#)
- [ip igmp snooping startup-query-interval](#)
- [ip igmp snooping other-querier-present-interval](#)
- [ip igmp snooping mrouter](#)
- [ip igmp snooping vlan mrouter](#)
- [shutdown snooping](#)
- [debug ip igmp snooping](#)
- [snooping leave-process config-level](#)
- [ip igmp snooping enhanced-mode](#)
- [ip igmp snooping sparse-mode](#)
- [snooping report-process config-level](#)
- [ip igmp snooping multicast-vlan](#)
- [mvr](#)
- [ip igmp snooping filter](#)
- [ip igmp snooping blocked-router](#)
- [ip igmp snooping multicast-vlan profile](#)
- [ip igmp snooping leavemode](#)
- [ip igmp snooping ratelimit](#)
- [ip igmp snooping limit](#)
- [ip igmp snooping filter-profileid](#)
- [ip igmp snooping proxy](#)
- [ip igmp snooping max-response-code](#)
- [ip igmp snooping mrouter-port -time-out](#)
- [ip igmp snooping mrouter-port-version](#)
- [show ip igmp snooping mrouter](#)
- [show ip igmp snooping mrouter - Redundancy](#)
- [show ip igmp snooping globals](#)
- [show ip igmp snooping](#)
- [show ip igmp snooping - Redundancy](#)
- [show ip igmp snooping groups](#)

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- [show ip igmp snooping forwarding-database](#)
- [show ip igmp snooping forwarding-database - Redundancy](#)
- [show ip igmp snooping statistics](#)
- [show ip igmp snooping blocked-router](#)
- [show ip igmp snooping multicast-receivers](#)
- [show ip igmp snooping port-cfg](#)
- [show ip igmp snooping multicast-vlan](#)
- [ip igmp snooping clear counters](#)
- [ip igmp snooping send-query](#)
- [ip igmp snooping static-group](#)



# Supermicro Switch Configuration CLI Guide

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## 23.1 ip igmp snooping

**Command Objective** This command enables IGMP snooping in the switch/ a specific VLAN. When snooping is enabled in a switch or interface, it learns the hosts intention to listen to a specific multicast address. When the switch receives any packet from the specified multicast address, it forwards the packet to the host listening for that address. Broadcasting is avoided to save bandwidth. When IGMP snooping is enabled globally, it is enabled in all the existing VLAN interfaces.

The no form of the command disables IGMP snooping in the switch/a specific VLAN. When IGMP snooping is disabled globally, it is disabled in all the existing VLAN interfaces.

---

### Syntax

#### Global Configuration Mode

```
ip igmp snooping [vlan <vlanid/vfi_id>]
```

```
no ip igmp snooping [vlan <vlanid/vfi_id>]
```




#### Config-VLAN Mode

```
ip igmp snooping
```

```
no ip igmp snooping
```


---

### Parameter Description

- **vlan <vlan-id/vfi-id>** - Enables IGMP snooping for the specified VLAN / VFI ID. This value ranges between 1 and 65535.
  - **<vlan -id>** - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094
  - **<vfi-id>** - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported.
    -  The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.
    -  VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW .
    -  The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.

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<b>Mode</b>	Global Configuration Mode / Config-VLAN Mode
<b>Default</b>	IGMP snooping is globally disabled, and in all VLANs.
	GMRP has to be disabled for enabling the IGMP snooping.
<b>Example</b>	<pre>Your Product(config)# ip igmp snooping Your Product(config-vlan)# ip igmp snooping</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>shutdown snooping</code> - Shuts down IGMP snooping in the switch.</li><li>• <code>ip igmp snooping fast-leave / ip igmp snooping vlan - immediate leave</code> - Enables fast leave processing and IGMP snooping for a specific VLAN</li><li>• <code>show ip igmp snooping</code> - Displays IGMP snooping information for all VLANs or a specific VLAN.</li><li>• <code>show ip igmp snooping globals</code> - Displays the IGMP snooping information for all VLANs or a specific VLAN.</li><li>• <code>snooping multicast-forwarding-mode</code> – Specifies the snooping multicast forwarding mode.</li><li>• <code>show ip igmp snooping multicast-receivers</code> – Displays IGMP multicast host information for all VLANs or a specific VLAN or specific VLAN and group address for a given switch or for all switches (if no switch is specified).</li><li>• <code>show ip igmp forwarding-database</code> - Displays multicast forwarding entries</li></ul>

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## 23.2 ip igmp snooping proxy-reporting

<b>Command Objective</b>	<p>This command enables proxy reporting in the IGMP snooping switch. When enabled, the switch supports the multicast router to learn the membership information of the multicast group. It forwards the multicast packets based on group membership information. The proxy-reporting switch acts as a querier to the downstream hosts. It sends proxy-reporting to upstream queriers.</p> <p>The no form of the command disables proxy reporting in the IGMP snooping switch.</p>
<b>Syntax</b>	<pre>ip igmp snooping proxy-reporting</pre> <pre>no ip igmp snooping proxy-reporting</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	Proxy-reporting is enabled
	Proxy reporting can be enabled in the IGMP snooping switch only if the proxy is disabled in the switch.
<b>Example</b>	<pre>Your Product(config)# ip igmp snooping proxy-reporting</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>no ip igmp snooping proxy</code> – Disables proxy in the IGMP snooping switch.</li><li>• <code>show ip igmp snooping globals</code> - Displays the IGMP snooping information for all VLANs or a specific VLAN</li><li>• <code>show ip igmp forwarding-database</code> - Displays multicast forwarding entries</li></ul>

## 23.3 snooping multicast-forwarding-mode

<b>Command Objective</b>	This command specifies the snooping multicast forwarding mode (IP based or MAC based). When ip mode is selected, and PIM and IGS are enabled, the L3 bitmap in the IPMC table is updated by PIM. The corresponding L2 bitmap is updated by querying the IGS to obtain Portlist. When PIM is disabled, IGS updates the L2 bitmap in the IPMC table directly. When the mode is MAC based, the L2 bitmap is updated by PIM which queries the VLAN to obtain Portlist. When PIM is disabled, the IGS updates the L2 bitmap directly.
<b>Syntax</b>	<code>snooping multicast-forwarding-mode {ip   mac}</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li><code>ip</code> - Configures the multicast forwarding mode as IP Address based. The PIM queries the IGS module to obtain the Portlist.</li> <li><code>mac</code> - Configures the multicast forwarding mode as MAC Address based. The PIM queries the VLAN to obtain the Portlist.</li> </ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	mac
<b>Example</b>	<code>Your Product(config)# snooping multicast-forwarding-mode mac</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><code>show ip igmp snooping globals</code> - Displays the IGMP snooping information for all VLANs or a specific VLAN</li> <li><code>ip igmp snooping enhanced-mode</code> - Enables/disables snooping system enhanced mode in the switch.</li> <li><code>ip igmp snooping static-group</code> - Configure IGMP snooping static multicast for Vlan(s)</li> </ul>

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## 23.4 ip igmp snooping mrouter-time-out

<b>Command Objective</b>	<p>This command sets the IGMP snooping router port purge time-out interval. Snooping learns the available router ports and initiates router port purge time-out timer for each learnt router port. The router sends control messages to the ports. If the router ports receive such control messages, the timer is restarted. If no message is received by the router ports before the timer expires, the router port entry is purged. The purge time-out value ranges between 60 and 600 seconds.</p> <p>The no form of the command sets the IGMP snooping router port purge time-out to default value.</p>
<b>Syntax</b>	<pre>ip igmp snooping mrouter-time-out &lt;(60 - 600) seconds&gt;  no ip igmp snooping mrouter-time-out</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	125 seconds
<b>Example</b>	<pre>Your Product(config)#ip igmp snooping mrouter-time-out 70</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip igmp snooping mrouter</code> - Displays detailed information about the router ports for all VLANs or specific VLAN</li><li>• <code>show ip igmp snooping globals</code> - Displays the global information of IGMP snooping</li></ul>

## 23.5 ip igmp querier-timeout

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<b>Command Objective</b>	<p>This command sets the IGMP snooping router port purge time-out interval. Snooping learns the available router ports and initiates router port purge time-out timer for each learnt router port. The routers send control messages to the ports. If the router ports receive such control messages, the timer is restarted. If no message is received by the router ports before the timer expires, the router port entry is purged. The purge time-out value ranges between 60 and 600 seconds.</p> <p>This command is a standardized implementation of the existing command; ip igmp snooping mrouter-time-out. It operates similar to the existing command.</p>
<b>Syntax</b>	<code>ip igmp querier-timeout &lt;(60 - 600) seconds&gt;</code>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	125 seconds
<b>Example</b>	<code>Your Product(config)#ip igmp querier-timeout 70</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip igmp snooping mrouter</code> - Displays detailed information about the router ports for all VLANs or specific VLAN</li><li>• <code>show ip igmp snooping globals</code> - Displays the global information of IGMP snooping</li></ul>

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## 23.6 ip igmp snooping port-purge-interval

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<b>Command Objective</b>	<p>This command configures the IGMP snooping port purge time interval. When the port receives reports from hosts, the timer is initiated. If the port receives another report before the timer expires, the timer is restarted. If the port does not receive any report from hosts till the timer expires, then the port entry is purged from the multicast database. The purge time interval value ranges between 130 and 1225 seconds.</p> <p>The no form of the command sets the IGMP snooping port purge time to default value.</p>
<b>Syntax</b>	<pre>ip igmp snooping port-purge-interval &lt;(130 - 1225) seconds&gt;</pre> <pre>no ip igmp snooping port-purge-interval</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	260 seconds
<b>Example</b>	<pre>Your Product (config)# ip igmp snooping port-purge-interval 150</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip igmp snooping</code> - Displays IGMP snooping information for all VLANs or a specific VLAN.</li><li>• <code>show ip igmp snooping globals</code> - Displays the IGMP snooping information for all VLANs or a specific VLAN</li></ul>

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## 23.7 ip igmp snooping source-only learning age-timer

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<b>Command Objective</b>	<p>This command configures the IGMP snooping port purge time interval. When the port receives reports from hosts, the timer is initiated. If the port receives another report before the timer expires, the timer is restarted. If the port does not receive any report from hosts till the timer expires, then the port entry is purged from the multicast database. The purge time interval value ranges between 130 and 1225 seconds.</p> <p>This command is a standardized implementation of the existing command; ip igmp snooping port-purge-interval. It operates similar to the existing command.</p>
<b>Syntax</b>	<pre>ip igmp snooping source-only learning age-timer &lt;short(130-1225)&gt;  no ip igmp snooping source-only learning age-timer</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	260 seconds
<b>Example</b>	<pre>Your Product (config)# ip igmp snooping source-only learning age-timer 200</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip igmp snooping</code> - Displays IGMP snooping information for all VLANs or a specific VLAN.</li><li>• <code>show ip igmp snooping globals</code> - Displays the IGMP snooping information for all VLANs or a specific VLAN</li></ul>


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## 23.8 ip igmp snooping report-suppression interval

<b>Command Objective</b>	<p>This command sets the IGMP snooping report-suppression time interval. The switch forwards IGMPv2 report message to the multicast group. A timer is started immediately after forwarding the report message and runs for set period of time. During this interval the switch does not forward another IGMPv2 report message addressed to the same multicast group to the router ports.</p> <p>The no form of the command sets the IGMP snooping report-suppression interval time to the default value.</p>
<b>Syntax</b>	<pre>ip igmp snooping report-suppression-interval &lt;(1 - 25) seconds&gt;</pre> <pre>no ip igmp snooping report-suppression-interval</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	5 seconds
	The ip igmp snooping report-suppression-interval is used only when the proxy and proxy-reporting are disabled.
<b>Example</b>	<pre>Your Product(config)# ip igmp snooping report-suppression-interval 20</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip igmp snooping globals</code> - Displays the IGMP snooping information for all VLANs or a specific VLAN</li></ul>

## 23.9 ip igmp snooping retry-count

<b>Command Objective</b>	<p>This command sets the maximum number of group specific queries sent by the switch to check if there are any interested v2 receivers for the group when it receives a leave message in the proxy/ proxy-reporting mode. The port is deleted from the group membership information in the forwarding database if the maximum retry count exceeds set number. This value ranges between 1 and 5.</p> <p>The no form of the command sets the number of group specific queries sent by the switch on reception of leave message to default value.</p>
<b>Syntax</b>	<pre>ip igmp snooping retry-count &lt;1 - 5&gt;</pre> <pre>no ip igmp snooping retry-count</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	2
<b>Example</b>	<pre>Your Product (config)# ip igmp snooping retry-count 4</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip igmp snooping globals</code> - Displays the IGMP snooping information for all VLANs or a specific VLAN</li><li>• <code>ip igmp snooping clear counters</code> - Clears the IGMP snooping statistics maintained for Vlan(s).</li></ul>

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## 23.10 ip igmp snooping group-query-interval

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**Command Objective** This command sets the time interval after which the switch sends a group specific query to find out if there are any interested receivers in the group when it receives a leave message. If it does not receive a response from the group, the port is removed from the group membership information in the forwarding database. This value ranges between 2 and 5.

The no form of the commands sets the group specific query interval time to default value.

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**Syntax** `ip igmp snooping group-query-interval <2-5> seconds>`

`no ip igmp snooping group-query-interval`

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**Mode** Global Configuration Mode

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**Default** 2 seconds

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**Example** `Your Product(config)# ip igmp snooping group-query-interval 3`


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**Related Command(s)**

- `show ip igmp snooping globals` - Displays the IGMP snooping information for all VLANs or a specific VLAN
- `show ip igmp snooping statistics` - Displays IGMP snooping statistics for all VLANs or a specific VLAN
- `show ip igmp snooping groups` - Displays IGMP group information for all VLANs or a specific VLAN

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## 23.11 ip igmp snooping report-forward

<b>Command Objective</b>	<p>This command configures the IGMP reports to be forwarded to all ports, router ports of a VLAN or non-edge ports. The configuration enables the switch to forward IGMP report messages to the selected ports thus avoiding flooding of the network.</p> <p>The no form of the command sets IGMP report-forwarding status to default value.</p>
<b>Syntax</b>	<pre>ip igmp snooping report-forward {all-ports   router-ports   non-edge-ports }  no ip igmp snooping report-forward</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>all-ports</b> - Configures the IGMP reports to be forwarded to all the ports of a VLAN</li><li>• <b>router-ports</b> - Configures the IGMP reports to be forwarded only to router ports of a VLAN</li><li>• <b>non-edge-ports</b> - Configures the IGMP reports to be forwarded only to STP non edge ports</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	router-ports
	In snooping mode, snooping module will forward reports only on router ports by default.
<b>Example</b>	<pre>Your Product(config)# ip igmp snooping report-forward all-ports</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>show ip igmp snooping globals</b> - Displays the IGMP snooping information for all VLANs or a specific VLAN</li></ul>

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## 23.12 ip igmp snooping query-forward

<b>Command Objective</b>	This command configures the IGMP queries to be forwarded to all Vlan member ports or only to non-router ports. This configuration directs the queries to the selected ports to avoid flooding of the network. The queries are forwarded to multicast groups. If the Vlan module is enabled, IGMP snooping sends and receives the multicast packets through Vlan module. When Vlan is disabled, it sends the multicast packets through Bridge initialization/shutdown sub module.
<b>Syntax</b>	<code>ip igmp snooping query-forward {all-ports   non-router-ports}</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>all-ports</b> - Configures the IGMP query forward administrative control status as all VLAN member ports. This is done to find out if there are any interested listeners in the network.</li><li>• <b>non-router-ports</b> - Configures the IGMP query forward administrative control status as non-router ports only. This is done to reduce the traffic in the network.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	non-router-ports
<b>Example</b>	<code>Your Product(config)# ip igmp snooping query-forward all-ports</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip igmp snooping globals</code> - Displays the IGMP snooping information for all VLANs or a specific VLAN.</li></ul>


## 23.13 ip igmp snooping version

<b>Command Objective</b>	This command configures the operating version of the IGMP snooping switch for a specific VLAN. The version can be set manually to execute condition specific commands.
<b>Syntax</b>	<code>ip igmp snooping version { v1  v2   v3}</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>v1</code> - Configures the version as IGMP snooping Version 1.</li><li>• <code>v2</code> - Configures the version IGMP snooping Version 2.</li><li>• <code>v3</code> - Configures the version IGMP snooping Version 3.</li></ul>
<b>Mode</b>	Config-VLAN Mode
<b>Default</b>	v3
<b>Example</b>	<code>Your Product(config-vlan)#ip igmp snooping version v2</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip igmp snooping</code> - Displays IGMP snooping information for all VLANs or a specific VLAN.</li><li>• <code>show ip igmp forwarding-database</code> - Displays multicast forwarding entries.</li></ul>

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## 23.14 ip igmp snooping fast-leave

<b>Command Objective</b>	<p>This command enables fast leave processing and IGMP snooping for a specific VLAN, It enables IGMP snooping only for the specific VLAN, when IGMP snooping is globally disabled.</p> <p>When the fast leave feature is enabled, port information is removed from a multicast group entry immediately after fast leave message is received.</p> <p>The no form of the command disables fast leave processing for a specific VLAN.</p>
<b>Syntax</b>	<pre>ip igmp snooping fast-leave</pre> <pre>no ip igmp snooping fast-leave</pre>
<b>Mode</b>	Config-VLAN Mode
<b>Default</b>	Fast leave processing is disabled
	Fast leave configurations done in a VLAN when IGMP snooping is disabled in a VLAN, will be applied only when IGMP snooping is enabled in the VLAN.
<b>Example</b>	<pre>Your Product (config-vlan)# ip igmp snooping fast-leave</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip igmp snooping</code> - Enables IGMP snooping in the switch/a specific VLAN</li><li>• <code>show ip igmp snooping</code> - Displays IGMP snooping information for all VLANs or a specific VLAN</li><li>• <code>show ip igmp snooping globals</code> - Displays the global information of IGMP snooping</li></ul>

## 23.15 ip igmp snooping vlan - immediate leave

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<b>Command Objective</b>	<p>This command enables fast leave processing and IGMP snooping for a specific VLAN, It enables IGMP snooping only for the specific VLAN, when IGMP snooping is globally disabled. When the fast leave feature is enabled, port information is removed from a multicast group entry immediately after fast leave message is received. The ID of the VLAN ranges between 1 and 4094.</p> <p>The no form of the command disables fast leave processing for a specific VLAN.</p> <p>This command is a standardized implementation of the existing command; ip igmp snooping fast-leave. It operates similar to the existing command.</p>
<b>Syntax</b>	<pre>ip igmp snooping vlan &lt;vlanid(1-4094)&gt; immediate-leave</pre> <pre>no ip igmp snooping vlan &lt;vlanid(1-4094)&gt; immediate-leave</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	Fast leave processing is disabled in all the VLANs
	Fast leave configurations done in a VLAN when IGMP snooping is disabled in a VLAN, will be applied only when IGMP snooping is enabled in the VLAN.
<b>Example</b>	<pre>Your Product (config)# ip igmp snooping vlan 1 immediate-leave</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip igmp snooping</code> - Enables IGMP snooping in the switch/a specific VLAN</li><li>• <code>show ip igmp snooping</code> - Displays IGMP snooping information for all VLANs or a specific VLAN.</li></ul>

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## 23.16 ip igmp snooping querier

<b>Command Objective</b>	<p>This command configures the IGMP snooping switch as a querier for a specific VLAN. When configured as a querier, the switch sends IGMP query messages. The query messages will be suppressed if there are any routers in the network.</p> <p>The no form of the command configures the IGMP snooping switch as non-querier for a specific VLAN.</p>
<b>Syntax</b>	<pre>ip igmp snooping querier</pre> <pre>no ip igmp snooping querier</pre>
<b>Mode</b>	Config-VLAN Mode
<b>Default</b>	Non-querier
<b>Example</b>	Your Product (config-vlan)# ip igmp snooping querier
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip igmp snooping</code> - Displays IGMP snooping information for all VLANs or a specific VLAN</li></ul>

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## 23.17 ip igmp snooping query-interval

<b>Command Objective</b>	<p>This command sets the time period with which the general queries are sent by the IGMP snooping switch when configured as querier on a VLAN. The switch sends querier messages in proxy mode and proxy-reporting mode to all downstream interfaces for this time interval. The value range is between 60 to 600 seconds.</p> <p>The no form of the command sets the IGMP querier interval to default value.</p>
<b>Syntax</b>	<pre>ip igmp snooping query-interval &lt;(60 - 600) seconds&gt;</pre> <pre>no ip igmp snooping query-interval</pre>
<b>Mode</b>	Config-VLAN Mode
<b>Default</b>	125 Seconds
	<ul style="list-style-type: none"><li>• The switch must be configured as a querier for this configuration to be imposed.</li><li>• In proxy reporting mode, general queries are sent on all downstream interfaces with this interval only if the switch is the Querier.</li><li>• In proxy mode, general queries will be sent on all downstream interfaces with this interval.</li></ul>
<b>Example</b>	<pre>Your Product (config-vlan) # ip igmp snooping query-interval 200</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip igmp snooping</code> - Displays IGMP snooping information for all VLANs or a specific VLAN</li></ul>

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## 23.18 ip igmp snooping startup-query-interval

<b>Command Objective</b>	<p>This command sets the time interval between the general query messages sent by the IGMP snooping switch, during startup of the querier election process. This time interval ranges between 15 and 150 seconds and should be less than or equal to query interval/ 4.</p> <p>The no form of the command sets the IGMP startup query interval to the default value.</p>
<b>Syntax</b>	<pre>ip igmp snooping startup-query-interval &lt;(15 - 150) seconds&gt;  no ip igmp snooping startup-query-interval</pre>
<b>Mode</b>	Config-VLAN Mode
<b>Default</b>	31 Seconds
	<ul style="list-style-type: none"><li>• The switch should be configured as querier for the startup query interval command to produce results.</li><li>• The startup query interval should be less than or equal to ¼ of the query interval.</li></ul>
<b>Example</b>	<pre>Your Product(config-vlan) # ip igmp snooping startup-query- interval 100</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip igmp snooping query-interval</code> - Sets the time period with which the general queries are sent by the IGMP snooping switch when configured as querier on a VLAN</li><li>• <code>show ip igmp snooping querier</code> - Displays IGMP snooping information for all VLANs or a specific VLAN</li><li>• <code>show ip igmp snooping</code> - Displays IGMP snooping information for all VLANs or a specific VLAN for a given context or for all the contexts.</li></ul>

## 23.19 ip igmp snooping startup-query-count

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<b>Command Objective</b>	<p>This command sets the maximum number of general query messages sent out on switch startup, when the switch is configured as a querier. This value ranges between two and five. Startup query messages are sent to announce the presence of the switch along with its identity. The startup query count is manually configured to change the existing count. This value ranges between 2 and 5.</p> <p>The no form of the command sets the number of general query messages sent out on switch startup, when the switch is configured as a querier to default value.</p>
<b>Syntax</b>	<pre>ip igmp snooping startup-query-count &lt;2 - 5&gt;</pre> <pre>no ip igmp snooping startup-query-count</pre>
<b>Mode</b>	Config-VLAN Mode
<b>Default</b>	2
	The switch should be configured as a querier for startup query count configuration to be effective.
<b>Example</b>	<pre>Your Product (config-vlan) # ip igmp snooping startup-query-count 4</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip igmp snooping querier</code> - Configures the IGMP snooping switch as a querier for a specific VLAN</li><li>• <code>ip igmp snooping query-interval</code> - Sets the time period with which the general queries are sent by the IGMP snooping switch</li><li>• <code>ip igmp snooping clear counters</code> - Clears the IGMP snooping statistics maintained for Vlan(s).</li><li>• <code>show ip igmp snooping</code> - Displays IGMP snooping information for all VLANs or a specific VLAN</li></ul>

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## 23.20 ip igmp snooping other-querier-present-interval

<b>Command Objective</b>	<p>This command sets the maximum time interval to decide that another querier is present in the network. This time interval ranges between 120 and 1215 seconds. Within this time interval if the querier receives response from another querier, then the one with a higher IP address is announced as the querier for the network. The other querier present interval must be greater than or equal to <math>((\text{Robustness Variable} * \text{Query Interval}) + (\text{Query Response Interval}/2))</math>. Here, Robustness value is 2.</p> <p>The no form of the command resets this interval to default value.</p>
<b>Syntax</b>	<pre>ip igmp snooping other-querier-present-interval &lt;value (120-1215) seconds&gt;  no ip igmp snooping other-querier-present-interval</pre>
<b>Mode</b>	Config-VLAN Mode
<b>Default</b>	255 Seconds
	The switch should be configured as a querier for the other querier present command to be effective.
<b>Example</b>	<pre>Your Product(config-vlan) # ip igmp snooping other-querier- present-interval 200</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip igmp snooping querier</code> - Configures the IGMP snooping switch as a querier for a specific VLAN</li><li>• <code>ip igmp snooping query-interval</code> - Sets the time period with which the general queries are sent by the IGMP snooping switch when configured as querier on a VLAN.</li><li>• <code>ip igmp snooping max-response-code</code> - Sets the maximum response code inserted in general queries send to host.</li><li>• <code>show ip igmp snooping</code> - Displays IGMP snooping information for all VLANs or a specific VLAN.</li></ul>

## 23.21 ip igmp snooping mrouter

<b>Command Objective</b>	<p>This command enables IGMP snooping and configures a list of multicast router ports for a specific VLAN, when IGMP snooping is globally enabled. This will enable IGMP snooping only for the specific VLAN, if IGMP snooping is globally disabled.</p> <p>Any IGMP message received on a switch is forwarded only on the router-ports and not on the host ports. In this manner, the IGMP snooping functionality avoids flooding of IGMP query messages from the host to the entire network.</p> <p>The no form of the command deletes the statically configured router ports for a VLAN.</p>
<b>Syntax</b>	<pre>ip igmp snooping mrouter &lt;interface-type&gt; &lt;0/a-b, 0/c, ...&gt;</pre> <pre>no ip igmp snooping mrouter &lt;interface-type&gt; &lt;0/a-b, 0/c, ...&gt;</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>&lt;interface-type&gt;</b> - Configures list of multicast router ports for the specified type of interface. The interface can be: <ul style="list-style-type: none"> <li>– qx-ethernet – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>– gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.</li> <li>– extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>– port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.</li> </ul> </li> <li>• <b>&lt;0/a-b, 0/c, ...&gt;</b> - Sets list of multicast router ports for the list of interfaces or a specific interface identifier. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel. Use comma as a separator without space while configuring list of interfaces. Example: 0/1,0/3 or 1, 3.</li> </ul>
<b>Mode</b>	Config-VLAN Mode
	The list of multicast router ports configured while IGMP snooping is disabled in the VLAN is applied only when the IGMP snooping is enabled in the VLAN.
<b>Example</b>	<pre>Your Product (config-vlan)# ip igmp snooping mrouter gigabitethernet 0/1-3</pre>

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## Related Command(s)

- `ip igmp snooping` - Enables IGMP snooping in the switch/a specific VLAN
  - `show ip igmp snooping mrouter` - Displays the router ports for all VLANs or specific VLAN.
  - `ip igmp snooping mrouter-port -time-out` - Configures the router port purge time-out interval for a VLAN.
  - `ip igmp snooping mrouter-port-version` - Configures the operating version of the router port for a VLAN.
-

## 23.22 ip igmp snooping vlan mrouter

**Command Objective** This command enables IGMP snooping and configures a list of multicast router ports for a specific VLAN, if IGMP snooping is globally enabled. This will enable IGMP snooping only for the specific VLAN, if IGMP snooping is globally disabled.

Any IGMP message received on a switch is forwarded only on the router-ports and not on host ports. In this manner, the IGMP snooping functionality avoids flooding of IGMP query messages from the host to the entire network.

The no form of the command deletes the statically configured router ports for a VLAN.

This command is a standardized implementation of the existing command; ip igmp snooping mrouter. It operates similar to the existing command.

**Syntax** `ip igmp snooping vlan <vlanid (1-4094)> mrouter <ifXtype> <0/a-b, 0/c, ...>`

`no ip igmp snooping vlan <vlanid (1-4094)> mrouter <ifXtype> <0/a-b, 0/c, ...>`


**Parameter Description**

- **<vlanid (1-4094)>** - Configures the VLAN for which the list of multicast router ports should be configured statically. This is a unique value that represents the specific L3 VLAN created. An L3 VLAN interface is a VLAN that is mapped to an IP interface and assigned an IP address. This value ranges between 1 and 4094.
- **<ifXtype>** - Configures the list of multicast router ports for the specified type of interface. The interface can be:
  - qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.
  - gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
  - extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.
  - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
- **<0/a-b, 0/c, ...>** - Sets the list of multicast router ports for the list of interfaces or a specific interface identifier. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel. Use comma as a separator without space while configuring list of interfaces. Example: 0/1, 0/3 or 1, 3.



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<b>Mode</b>	Global Configuration Mode
	The list of multicast router ports configured while IGMP snooping is disabled in the VLAN is applied only when the IGMP snooping is enabled in the VLAN.
<b>Example</b>	<pre>Your Product(config)# ip igmp snooping vlan 1 mrouter gigabitethernet 0/1</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip igmp snooping</code> - Enables IGMP snooping in the switch/a specific VLAN</li><li>• <code>show ip igmp snooping mrouter</code> - Displays the router ports for all VLANs or specific VLAN</li><li>• <code>ip igmp snooping mrouter-port -time-out</code> - Configures the router port purge time-out interval for a VLAN</li><li>• <code>ip igmp snooping mrouter-port-version</code> - Configures the operating version of the router port for a VLAN</li></ul>

---

## 23.23 shutdown snooping

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<b>Command Objective</b>	<p>This command shuts down snooping in the switch. When the user does not require the IGMP snooping module to be running, it can be shut down. When shut down, all resources acquired by the Snooping Module are released to the system. For the IGS feature to be functional on the switch, the 'system-control' status must be set as 'start' and the 'state' must be 'enabled'.</p> <p>The no form of the command starts and enables snooping in the switch.</p>
<b>Syntax</b>	<p><code>shutdown snooping</code></p> <p><code>no shutdown snooping</code></p>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	Snooping is enabled
	Snooping cannot be started in the switch, if the base bridge mode is configured as transparent bridging.
<b>Example</b>	<code>Your Product(config)# shutdown snooping</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>base bridge-mode</code> - Configures the mode in which the VLAN feature should operate on the switch.</li><li>• <code>ip igmp snooping</code> - Enables IGMP snooping in the switch/a specific VLAN</li></ul>

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## 23.24 debug ip igmp snooping

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**Command Objective** This command configures the various debug and trace statements to handle error and event management available in the igmp snooping module. The traces are enabled by passing the necessary parameters.

The no form of the command resets debug options for IGMP snooping module.

---

**Syntax**

```
debug ip igmp snooping
{[init][resources][tmr][src][grp][qry]
[vlan][pkt][fwd][mgmt][redundancy] | all } [switch
<switch_name>]
```

```
no debug ip igmp snooping
{[init][resources][tmr][src][grp][qry]
[vlan][pkt][fwd][mgmt][redundancy] | all } [switch
<switch_name>]
```

---

**Parameter Description**

- **init** - Generates Init and Shutdown trace messages at the instances when the module is initiated or shutdown. The information is logged in a file.
  - **resources** - Generates System Resources management trace messages when there is a change in the resource status. The information is logged in a file.
  - **tmr** - Generates Timer trace messages at the instances where timers are involved. The information is logged in a file.
  - **src** - Generates trace messages when Source Information is involved.
  - **grp** - Generates trace messages when Group Information is involved.
  - **qry** - Generates trace messages when Query messages are sent or received.
  - **vlan** - Generates trace messages when VLAN related Information is involved.
  - **pkt** - Generates debug statements for packets handling traces. This trace is generated when there is an error condition in transmission or reception of packets.
  - **fwd** - Generates traces messages when forwarding Database is involved.
  - **mgmt** - Generates debug statements for management plane functionality traces.
  - **redundancy** - Generates debug statements for redundancy code flow traces. This trace is generated when there is a failure in redundancy
-

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processing.

- **all** - Generates all types of trace messages
- **switch <switch\_name>** - Generates switch related trace messages.

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**Mode** Privileged EXEC Mode

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**Default** Debugging is Disabled.

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**Example** Your Product# `debug ip igmp snooping fwd`

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**Related Command(s)**

- `show debugging` - Displays state of each debugging option

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## 23.25 snooping leave-process config-level

<b>Command Objective</b>	This command specifies the level of configuring the leave processing mechanisms. When the switch intercepts a leave group message on a switch port, it normally sends a query to that multicast group through the same switch port. If no hosts respond to the query and no multicast routers have been discovered on the switch port, that port is removed from the multicast group.
<b>Syntax</b>	<code>snooping leave-process config-level {vlan   port}</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>vlan</b> - Configures the leave mechanism at the Vlan level. In Vlan based leave processing mode, the fast leave functionality configurable per vlan or normal leave configurations are available for processing leave messages.</li><li>• <b>port</b> - Configures the leave mechanism at port level. In Port based leave processing mode, the explicit host tracking functionality, the fast leave functionality or normal leave configurable on a interface are used for processing the leave messages.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	vlan
<b>Example</b>	<pre>Your Product(config)# snooping leave-process config-level port</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip igmp snooping leavemode</code> – Configures the port leave mode for an interface.</li><li>• <code>show ip igmp snooping globals</code> – Displays IGMP snooping information for all VLANs or a specific VLAN for a given switch or for all switch (if switch is not specified)</li></ul>


## 23.26 ip igmp snooping enhanced-mode

<b>Command Objective</b>	This command configures snooping system enhanced mode in the switch. It is a mode of operation provided to enhance the operation of IGMP snooping module to duplicate Multicast traffic by learning Multicast group entries based on the Port and Inner Vlan. This mode of operation is applied when the down stream devices are less intelligent or not capable of duplicating Multicast traffic.
<b>Syntax</b>	<code>ip igmp snooping enhanced-mode { enable   disable }</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li><code>enable</code> - Enables snooping system enhanced mode in the switch.</li> <li><code>disable</code> - Disables snooping system enhanced mode in the switch.</li> </ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	disable
 <b>Note</b>	Enhanced mode is in enabled state only when the snooping mode is set as IP Based
<b>Example</b>	<code>Your Product(config)# ip igmp snooping enhanced-mode enable</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><code>snooping multicast-forwarding-mode</code> – Specifies the snooping multicast forwarding mode.</li> <li><code>show ip igmp snooping globals</code> – Displays IGMP snooping information for all VLANs or a specific VLAN for a given switch or for all switch (if switch is not specified).</li> <li><code>ip igmp snooping leavemode</code> – Configures the port leave mode for an interface.</li> <li><code>ip igmp snooping ratelimit</code> – Configures the rate limit for a downstream interface in units of the number of IGMP packets per second.</li> <li><code>ip igmp snooping limit</code> – Configures the maximum limit type for an interface.</li> <li><code>ip igmp snooping filter-profileId</code> – Configures the multicast profile index for a downstream interface.</li> </ul>

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## 23.27 ip igmp snooping sparse-mode

<b>Command Objective</b>	This command configures snooping system sparse mode in the switch. In the sparse mode, the IGS module drops the unknown multicast traffic when there is no listener for the multicast data. In the non-sparse-mode, the IGS module forwards the unknown multicast traffic. The multicast data gets flooded to the member port of vlan.
<b>Syntax</b>	<code>ip igmp snooping sparse-mode { enable   disable }</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>enable</b> - Enables snooping system sparse mode in the switch. Drops unknown multicast packets.</li><li>• <b>disable</b> - Disables snooping system sparse mode in the switch. Floods unknown multicast packets.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	disable
	Sparse mode is in enabled state only when the snooping mode is set as MAC Based
<b>Example</b>	<code>Your Product(config)# ip igmp snooping sparse-mode enable</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip igmp snooping globals</code> – Displays the IGMP snooping information for all VLANs or a specific VLAN.</li></ul>

## 23.28 snooping report-process config-level

<b>Command Objective</b>	This command sets the configuration-level for report processing as non-router ports or as all ports.
<b>Syntax</b>	<code>snooping report-process config-level {non-router-ports   all-ports}</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>non-router-ports</code> - The incoming report messages are processed only in the non-router ports. Report message received on the router ports are not processed in this configuration.</li><li>• <code>all-ports</code> - The incoming report messages are processed in all the ports inclusive of router ports.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	non-router-ports
<b>Example</b>	<pre>Your Product(config)# snooping report-process config-level all-ports</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip igmp snooping globals</code> - Displays the IGMP snooping information for all VLANs or a specific VLAN.</li></ul>



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## 23.29 ip igmp snooping multicast-vlan

<b>Command Objective</b>	This command configures the multicast VLAN feature on a port. Multicast VLAN feature is used for applications where wide-scale deployment of multicast traffic is necessary. MVLAN registration allows a subscriber on a port to subscribe and unsubscribe to a particular multicast stream on any of the multicast VLANs. Multicast VLANs enable efficient multicast data flow in separate M-VLANs, while normal data flows through VLANs.
<b>Syntax</b>	<code>ip igmp snooping multicast-vlan {enable disable}</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>enable</b> - Enables the multicast Vlan feature. Router sends a single copy of the data for the particular MVLAN, instead of forwarding a separate copy of the multicast data to each VLAN. This saves the network bandwidth</li><li>• <b>disable</b> - Disables the multicast Vlan feature. A separate copy of the multicast data has to be forwarded from the router in the absence of M-VLAN.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	disable
<b>Example</b>	<pre>Your Product(config)# ip igmp snooping multicast-vlan enable</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip igmp snooping multicast-vlan</code> – Displays multicast VLAN statistics in a switch and displays various profiles mapped to the multicast VLANs.</li><li>• <code>show ip igmp snooping globals</code> – Displays IGMP snooping information for all VLANs or a specific VLAN for a given switch or for all switch (if switch is not specified)</li></ul>

## 23.30 mvr

**Command Objective** This command configures the multicast VLAN feature on a port. Multicast VLAN feature is used for applications where wide-scale deployment of multicast traffic is necessary. MVLAN Registration allows a subscriber on a port to subscribe and unsubscribe to a particular multicast stream on any of the multicast VLANs. Multicast VLANs enable efficient multicast data flow in separate M-VLANs, while normal data flows through VLANs.

The no form of this command disables the multicast VLAN feature.

This command is a standardized implementation of the existing command; ip igmp snooping multicast-vlan. It operates similar to the existing command.

**Syntax** `mvr`  
`no mvr`

**Mode** Global Configuration Mode

**Package** Workgroup, Enterprise, Metro\_E and Metro

**Example** `Your Product(config)# mvr`

**Related Command(s)**

- `show ip igmp snooping multicast-vlan` – Displays multicast VLAN statistics in a switch and displays various profiles mapped to the multicast VLANs
- `show ip igmp snooping globals` – Displays IGMP snooping information for all VLANs or a specific VLAN for a given switch or for all switch (if switch is not specified)

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## 23.31 ip igmp snooping filter

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<b>Command Objective</b>	<p>This command configures the IGMP snooping filter. The IGS filtering feature restricts channel registration from being added to the database. In transparent snooping, the filtered packet will not be added to the snooping database but will be forwarded upstream. When disabled, all the filter related configurations remain but the incoming reports will not be subject to filtering. IGS module programs the hardware to remove the configured rate limit. It flushes all the registrations learnt through a port if a threshold limit is configured for this interface.</p> <p>The no form of the command disables the IGMP snooping filter.</p>
<b>Syntax</b>	<pre>ip igmp snooping filter</pre> <pre>no ip igmp snooping filter</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	disabled.
<b>Example</b>	<pre>Your Product(config)# ip igmp snooping filter</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip igmp snooping globals</code> – Displays IGMP snooping information for all VLANs or a specific VLAN for a given switch or for all switch (if switch is not specified).</li><li>• <code>ip igmp snooping ratelimit</code> – Configures the rate limit for a downstream interface in units of the number of IGMP packets per second.</li><li>• <code>ip igmp snooping limit</code> – Configures the maximum limit type for an interface.</li><li>• <code>ip igmp snooping filter-profileId</code> – Configures the multicast profile index for a downstream interface.</li></ul>

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## 23.32 ip igmp snooping blocked-router

<b>Command Objective</b>	This command configures a static router-port as blocked router port.
	When configured as a blocked router, the queries, PIM DVMRP and data messages are discarded, The corresponding port entry is removed from the forwarding database. The ports to be configured as blocked router ports, must not be configured as static router ports.
	The no form of the command resets the blocked router ports to normal router port.
<b>Syntax</b>	<pre>ip igmp snooping blocked-router &lt;interface-type&gt; &lt;0/a-b, 0/c, ...&gt;</pre> <pre>no ip igmp snooping blocked-router &lt;interface-type&gt; &lt;0/a-b, 0/c, ...&gt;</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>&lt;interface-type&gt;</b> - Configures the type of interface to be employed on the port. <ul style="list-style-type: none"> <li>– qx-ethernet – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>– gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.</li> <li>– extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.</li> <li>– port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.</li> </ul> </li> <li>• <b>&lt;0/a-b, 0/c, ...&gt;</b> - Configures the list of router-ports to be set as blocked. The interface ids are given as an array. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel. Use comma as a separator without space while configuring list of interfaces. Example: 0/1, 0/3 or 1, 3.</li> </ul>
<b>Mode</b>	Config-VLAN Mode
	The ports to be configured as blocked router ports, must not be configured as static router ports.
<b>Example</b>	<pre>Your Product (config-vlan)# ip igmp snooping blocked-router gigabitethernet 0/4-5</pre>

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## Related Command(s)

- `show ip igmp snooping blocked-router` – Displays the blocked router ports for all VLANs or a specific VLAN for a given switch or for all the switches (if no switch is specified)
-

## 23.33 ip igmp snooping multicast-vlan profile

<b>Command Objective</b>	<p>This command configures profile ID to VLAN mapping for multicast VLAN classification. The switch is configured with list of entries such as multicast group, multicast source and filter mode. These entries are maintained in access profiles. Each profile is associated with a particular vlan which is categorized as multicast vlan. When any untagged report or leave message is received ( that is, packet with no tag in a customer bridge or packet with no S-tag in a provider or 802.1ad bridge), and if the group and source address in the received packet matches any rule in this profile, then the received packet is classified to be associated to the VLAN (that is, multicast VLAN) to which the profile is mapped.</p> <p>The no form of the command removes the profile ID to VLAN mapping for multicast VLAN classification.</p>
<b>Syntax</b>	<pre>ip igmp snooping multicast-vlan profile &lt;Profile ID (0-4294967295)&gt; no ip igmp snooping multicast-vlan profile</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>&lt;Profile ID (0-4294967295)&gt;</b> - Configures the multicast profile ID for a particular VLAN. This value ranges between 0 and 4294967295.</li> </ul>
<b>Mode</b>	Config-VLAN Mode
<b>Default</b>	0
	<ul style="list-style-type: none"> <li>• Multicast snooping mode should be IP based.</li> <li>• This command can be executed only after creating a multicast profile and setting the action for the created profile as permit.</li> <li>• The configurations done by this command will take effect only if the profile is activated.</li> </ul>
<b>Example</b>	<pre>Your Product (config-vlan)# ip igmp snooping multicast-vlan profile 1</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li>• <b>ip mcast profile</b> – Creates or modifies a multicast profile.</li> <li>• <b>permit</b>– Configures the action for the profile as permit.</li> <li>• <b>profile active</b> – Activates the profile entry.</li> <li>• <b>show ip mcast profile statistics</b> – Displays the profile statistics.</li> </ul>

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## 23.34 ip igmp snooping leavemode

<b>Command Objective</b>	This command configures the port leave mode for an interface. The mechanism to process the leave messages in the downstream is selected. The switch sends an IGMP query message to find if there is any host interested in the multicast group.
<b>Syntax</b>	<code>ip igmp snooping leavemode {exp-hosttrack   fastLeave   normalleave} [InnerVlanId &lt;short (1-4094)&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>exp-hosttrack</b> - Configures the port to use the explicit host tracking mode to process the leave messages. The decision to remove the interface is made based on the tracked host information</li><li>• <b>fastLeave</b> - Configures the port to use the fast leave mode to process the leave messages. On receiving a leave message the interface is removed from the group registration and the leave message is sent to the router ports.</li><li>• <b>normalleave</b> - Configures the port to use the normal leave mode. The normal leave mode is applicable only for v2 hosts. When the system receives a v2 leave message, it sends a group specific query on the interface. For v3 hosts normal leave has no effect.</li><li>• <b>innerVlanId &lt;short (1-4094)&gt;]</b> - Configures the inner vlan Id. In provider bridging domain, the customer vlan itag is denoted as innervlan id. This value ranges between 1 and 4094.<ul style="list-style-type: none"><li>– If InnerVlanId is specified, multicast forwarding mode must be IP based and enhanced mode must be enabled in the snooping system,</li><li>– If InnerVlanId is not specified, leave mode can be configured irrespective of multicast forwarding mode and enhanced mode status.</li></ul></li></ul>
<b>Mode</b>	Interface configuration mode
<b>Package</b>	Workgroup, Enterprise, Metro_E and Metro
<b>Default</b>	exp-host track/fastLeave/normalleave - Normalleave
<b>Example</b>	<pre>Your Product(config-if)# ip igmp snooping leavemode fastLeave InnerVlanId 1</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>snooping leave-process config-level</b> – Specifies the level of configuring the leave processing mechanisms</li><li>• <b>ip igmp snooping enhanced-mode</b> – Enables/disables snooping system enhanced mode in the switch.</li></ul>

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- **snooping multicast-forwarding-mode** – Specifies the snooping multicast forwarding mode.
  - **show ip igmp snooping port-cfg** – Displays IGS Port configuration information for all Inner VLANs or a specific Inner VlanId or a given switch.
  - **show ip igmp snooping multicast-receivers** – Displays IGMP multicast host information for all VLANs or a specific VLAN or specific VLAN and group address for a given switch or for all switches (if no switch is specified).
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## 23.35 ip igmp snooping ratelimit

<b>Command Objective</b>	<p>This command configures the rate limit for a downstream interface in units of the number of IGMP packets per second. The switch allows to configure the maximum rate of IGMP reports incoming for a port. The IGMP rate limiting eliminates the bursts or attacks from specific physical port. It prevents the exhaustion of system resources.</p> <p>The no form of the command resets the rate limit to default value for an interface. By default, the rate limit will hold the maximum value supported by an unsigned integer and will not rate limit any IGMP packets.</p>
<b>Syntax</b>	<pre>ip igmp snooping ratelimit &lt;integer&gt; [InnerVlanId &lt;short (1-4094)&gt;]  no ip igmp snooping ratelimit [InnerVlanId &lt;short (1-4094)&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>ratelimit &lt;integer&gt;</b> - Configures the ratelimit value for a downstream interface in units of the number of IGMP packets per second</li><li>• <b>InnerVlanId &lt;short (1-4094)&gt;</b> - Configures the ratelimit value for Inner VLAN identifier. This value ranges between 1 and 4094. If InnerVlanId is specified, then enhanced mode should be enabled otherwise enhanced mode need not be enabled</li></ul>
<b>Mode</b>	Interface configuration mode
<b>Default</b>	rate limit is 4294967295.
	<ul style="list-style-type: none"><li>• The actual rate supported will depend on what the system can support.</li><li>• The IGMP snooping filter must be enabled for this configuration to have the effect.</li><li>• Even with out enabling IGMP snooping filter, control plane data structure update takes place. But the benefits can be realized only when IGMP Snooping filter is enabled.</li></ul>
<b>Example</b>	<pre>Your Product(config-if)# ip igmp snooping ratelimit 100 InnerVlanId 1</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>ip igmp snooping enhanced-mode</b> – Enables/disables snooping system enhanced mode in the switch.</li><li>• <b>ip igmp snooping filter</b> – Enables the IGMP snooping filter.</li></ul>

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- `show ip igmp snooping port-cfg` – Displays IGS Port configuration information for all Inner VLANs or a specific Inner VlanId or a given switch.
  - `ip mcast profile` – Creates or modifies a multicast profile.
  - `profile active` – Activates the profile entry.
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## 23.36 ip igmp snooping limit

<b>Command Objective</b>	<p>This command configures the maximum limit type for an interface. The maximum limit is the number of unique registrations for a channel or group.</p> <p>The no form of the command configures the maximum limit type as none for an interface.</p>
<b>Syntax</b>	<pre>ip igmp snooping limit { channels   groups } &lt;integer32&gt; [InnerVlanId &lt;short (1-4094)&gt;]  no ip igmp snooping limit [InnerVlanId &lt;short (1-4094)&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>Channels</b> - Configures the snooping maximum limit as channels (group, source). Channel limit is applied for IGMPv3 include and allow reports.</li><li>• <b>Groups</b> - Configures the snooping maximum limit as groups. Group limit is applied for all IGMP reports.</li><li>• <b>&lt;integer32&gt;</b> - Configures the snooping maximum limit. The maximum limit is the number of unique registrations for a channel or group. This value ranges between 0 and 4294967295.</li><li>• <b>InnerVlanId &lt;short (1-4094)&gt;</b> - Configures the maximum limit type for the Inner VLAN identifier. This value ranges between 1 and 4094. If InnerVlanId is specified, then enhanced mode should be enabled otherwise enhanced mode need not be enabled.</li></ul>
<b>Mode</b>	Interface configuration mode
<b>Default</b>	The limit is set as 0 so that no limiting is done.
	<ul style="list-style-type: none"><li>• The IGMP snooping filter must be enabled for this configuration to have the effect.</li><li>• Even without enabling IGMP snooping filter, control plane data structure update takes place. But the benefits can be realized only when IGMP Snooping filter is enabled.</li></ul>
<b>Example</b>	<pre>Your Product(config-if)# ip igmp snooping limit groups 10 InnerVlanId 1</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>ip igmp snooping enhanced-mode</b> – Enables/disables snooping system enhanced mode in the switch.</li><li>• <b>ip igmp snooping filter</b> – Enables the IGMP snooping filter.</li></ul>

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- `show ip igmp snooping port-cfg` – Displays IGS Port configuration information for all Inner VLANs or a specific Inner VlanId or a given switch.
  - `ip mcast profile` – Creates or modifies a multicast profile.
  - `profile active` – Activates the profile entry.
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## 23.37 ip igmp snooping filter-profileId

<b>Command Objective</b>	<p>This command configures the multicast profile index for a downstream interface. This profile contains a set of allowed or denied rules to be applied for the IGMP packets received through this downstream interface.</p> <p>The no form of the command resets the multicast profile index to default value.</p>
<b>Syntax</b>	<pre>ip igmp snooping filter-profileId &lt;integer&gt; [InnerVlanId &lt;short (1-4094)&gt;]  no ip igmp snooping filter-profileId [InnerVlanId &lt;short (1-4094)&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li><b>filter-profileId &lt;integer&gt;</b> - Configures the multicast filter profile index for a downstream interface.</li><li><b>InnerVlanId &lt;short (1-4094)&gt;</b> - Configures multicast filter profile index for the Inner VLAN identifier. This value ranges between 1 and 4094. If InnerVlanId is specified, then enhanced mode should be enabled otherwise enhanced mode need not be enabled.</li></ul>
<b>Mode</b>	Interface configuration mode
<b>Default</b>	The profile ID is 0.
	<ul style="list-style-type: none"><li>The IGMP snooping filter must be enabled for this configuration to have the effect.</li><li>Even without enabling IGMP snooping filter, control plane data structure update takes place. But the benefits can be realized only when IGMP Snooping filter is enabled.</li><li>IGMP Snooping Multicast forwarding mode must be IP based.</li></ul>
<b>Example</b>	<pre>Your Product(config-if)# ip igmp snooping filter-profileId 2 InnerVlanId 1</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><b>ip igmp snooping enhanced-mode</b> – Enables/disables snooping system enhanced mode in the switch.</li><li><b>ip igmp snooping filter</b> – Enables the IGMP snooping filter.</li><li><b>snooping multicast-forwarding-mode ip</b> - Sets the snooping multicast forwarding mode as IP address based.</li><li><b>show ip igmp snooping port-cfg</b> – Displays IGS Port configuration information for all Inner VLANs or a specific Inner VlanId or a given switch.</li></ul>

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- `ip mcast profile` – Creates or modifies a multicast profile.
  - `profile active` – Activates the profile entry.
  - `show ip mcast profile statistics` – Displays the profile statistics.
-

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## 23.38 ip igmp snooping proxy

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<b>Command Objective</b>	<p>This command enables proxy in the IGMP snooping switch. In proxy mode, the switch acts as a querier for all downstream interfaces and a host for all upstream interfaces. The switch sends general query to all downstream interfaces at the query interval and collects information about the member ports. The proxy sends current consolidated report and state change report to upstream interfaces.</p> <p>The no form of the command disables proxy in the IGMP snooping switch.</p>
<b>Syntax</b>	<pre>ip igmp snooping proxy</pre> <pre>no ip igmp snooping proxy</pre>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	The proxy is disabled in the IGMP snooping switch.
	Proxy can be enabled in the IGMP snooping switch only if the proxy reporting is disabled in the snooping switch.
<b>Example</b>	<pre>Your Product(config)# ip igmp snooping proxy</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>no ip igmp snooping proxy-reporting</code> – Disables proxy reporting in the IGMP snooping switch.</li><li>• <code>show ip igmp snooping globals</code> – Displays IGMP snooping information for all VLANs or a specific VLAN for a given switch or for all switch (if switch is not specified).</li></ul>

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## 23.39 ip igmp snooping max-response-code

<b>Command Objective</b>	<p>This command sets the maximum response code inserted in general queries sent to host. The unit of the response code is tenth of second. This value ranges between 0 and 255.</p> <p>The no form of the command sets the query response code to default value.</p>
<b>Syntax</b>	<pre>ip igmp snooping max-response-code &lt;(0 - 255)&gt;</pre> <pre>no ip igmp snooping max-response-code</pre>
<b>Mode</b>	Config-VLAN Mode
<b>Default</b>	100
<b>Example</b>	<pre>Your Product(config-vlan)# ip igmp snooping max-response-code 10</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip igmp snooping</code> - Displays IGMP snooping information for all VLANs or a specific VLAN.</li></ul>

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## 23.40 ip igmp snooping mrouter-port –time-out

**Command Objective** This command configures the router port purge time-out interval for a VLAN. The time interval after which the proxy assumes there are no v1/v2 routers present on the upstream port. While the older querier timer is running, the proxy replies to all the queries with consolidated v1/v2 reports. When the timer expires, if the v2/v3 queriers are not present and the port is dynamically learnt, the port is purged. If the port is static, router port, the proxy replies to all queries with new version of v2/v3 consolidated reports.

The no form of the command resets the router port purge time-out interval to default, for a VLAN.

**Syntax**

```
ip igmp snooping mrouter-port <ifXtype> <iface_list> time-out <short(60-600)>
```

```
no ip igmp snooping mrouter-port <interface-type> <0/a-b, 0/c, ...>
```

**Parameter Description**

- **<ifXtype> / <interface-type>** - Configures the purge time-out interval for the specified type of interface. The interface can be:
  - qx-ethernet – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.
  - gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
  - extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.
  - port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.
- **<iface\_list> / <0/a-b, 0/c, ...>** - Configures the list of multicast router ports for the list of interfaces or a specific interface identifier. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel. Use comma as a separator without space while configuring list of interfaces. Example: 0/1, 0/3 or 1, 3.
- **time-out <short(60-600)>** - Configures the router port purge time-out interval. This value ranges between 60 and 600 seconds.

**Mode** Config-VLAN Mode

**Default** time-out - 125 seconds



The router ports must be statically configured for the VLAN.

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**Example**

```
Your Product(config-vlan)# ip igmp snooping mrouter-port  
gigabitethernet 0/1-3 time-out 150
```


---

**Related Command(s)**

- `ip igmp snooping mrouter` – Configures statically the router ports for a VLAN
  - `show ip igmp snooping mrouter detail`– Displays detailed information about the router ports.
-

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## 23.41 ip igmp snooping mrouter-port-version

<b>Command Objective</b>	<p>This command configures the operating version of IGMP PROXY on the upstream router port for a VLAN.</p> <p>The no form of the command resets the operating version of the IGMP PROXY on the upstream router port to its default operating version.</p>
<b>Syntax</b>	<pre>ip igmp snooping mrouter-port &lt;ifXtype&gt; &lt;iface_list&gt; version {v1   v2   v3}  no ip igmp snooping mrouter-port &lt;ifXtype&gt; &lt;iface_list&gt; version</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;ifXtype&gt;</b> - Configures the operating version of IGMP PROXY for the specified type of interface. The interface can be:<ul style="list-style-type: none"><li>– qx-ethernet – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.</li><li>– gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.</li><li>– extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.</li><li>– port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.</li></ul></li><li>• <b>&lt;iface_list&gt;</b> - Configures the operating version of IGMP PROXY for the list of multicast router ports for the list of interfaces or a specific interface identifier. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel. Use comma as a separator without space while configuring list of interfaces. Example: 0/1, 0/3 or 1, 3.</li><li>• <b>Version</b> - Configures the operating version of the IGMP snooping<ul style="list-style-type: none"><li>– <b>v1</b> – IGMP snooping Version 1</li><li>– <b>v2</b> – IGMP snooping Version 2</li><li>– <b>v3</b> – IGMP snooping Version 3</li></ul></li></ul>
<b>Mode</b>	Config-VLAN Mode
<b>Default</b>	v3
	The router ports must be statically configured for the VLAN.

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**Example**

```
Your Product(config-vlan)# ip igmp snooping mrouter-port  
gigabitethernet 0/2 version v1
```

---




**Related Command(s)**

- `ip igmp snooping mrouter` – Configures statically the router ports for a VLAN.
  - `show ip igmp snooping mrouter detail` – Displays detailed information about the router ports
-

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## 23.42 show ip igmp snooping mrouter

<b>Command Objective</b>	This command displays the router ports for all VLANs or a specific VLAN for a given switch or for all the switches (if no switch is specified). The interface details and the corresponding port number along with its type (static/dynamic) are displayed.
<b>Syntax</b>	<code>show ip igmp snooping mrouter [Vlan &lt;vlan-id/vfi-id&gt;] [detail] [switch &lt;switch_name&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>Vlan &lt;vlan-id/vfi-id&gt;</b> - Displays the router ports for the specified VLAN / VFI ID. This value ranges between 1 and 65535.<ul style="list-style-type: none"><li>– <b>&lt;vlan -id&gt;</b> - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094</li><li>– <b>&lt;vfi-id&gt;</b> - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This type of switch is not supported.<ul style="list-style-type: none"><li> The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.</li><li> VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW .</li><li> The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.</li></ul></li></ul></li><li>• <b>detail</b> - Displays detailed information about the router ports</li><li>• <b>switch &lt;switch_name&gt;</b> - Displays the router ports for the specified context. This value represents unique name of the switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<p><b>Single Instance</b></p> <pre>Your Product# show ip igmp snooping mrouter Vlan   Ports -----   1    Gi0/1(dynamic), Gi0/2(static)   2    Gi0/1(static), Gi0/2(dynamic)</pre>

### Multiple Instance

```
Your Product# show ip igmp snooping mrouter
```

```
Switch cust1
```

```
Vlan    Ports
```

```
-----
```

```
1 Gi0/1(static)
```

```
2 Gi0/1(static)
```

```
Switch cust2
```

```
Vlan    Ports
```

```
-----
```

```
1 Gi0/9(static)
```

```
2 Gi0/9(static)
```




---

### Related Command(s)

- `ip igmp snooping mrouter-time-out / ip igmp querier-timeout` - Sets the IGMP snooping router port purge time-out interval
  - `ip igmp snooping mrouter` - Configures statically the router ports for a VLAN.
  - `ip igmp snooping mrouter-port -time-out` - Configures the router port purge time-out interval for a VLAN.
  - `ip igmp snooping mrouter-port-version` - Configures the operating version of the router port for a VLAN.
-

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## 23.43 show ip igmp snooping mrouter - Redundancy

<b>Command Objective</b>	This command displays the router ports for all VLANs or a specific VLAN for a given switch or for all switches (if no switch is specified).
<b>Syntax</b>	<pre>show ip igmp snooping mrouter [Vlan &lt;vlan-id/vfi-id&gt;] [redundancy] [detail] [switch &lt;switch_name&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>Vlan &lt;vlan-id/vfi-id&gt;</b> - Displays the router ports for the specified VLAN / VFI ID. This value ranges between 1 and 65535.<ul style="list-style-type: none"><li>– <b>&lt;vlan -id&gt;</b> - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094</li><li>– <b>&lt;vfi-id&gt;</b> - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported.<ul style="list-style-type: none"><li> The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.</li><li> VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW .</li><li> The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.</li></ul></li></ul></li><li>• <b>redundancy</b> - Displays the Synced Messages</li><li>• <b>detail</b> - Displays detailed information about the router ports</li><li>• <b>switch &lt;switch_name&gt;</b> - Displays the specified context. This value represents unique name of the switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show ip igmp snooping mrouter redundancy Igs Redundancy Vlan Sync Data for Vlan 1 Vlan Router Port List Vlan  Ports -----  ----- 1  Gi0/1(dynamic), Gi0/3(dynamic)</pre>

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IGMP Router Port List

Vlan IGMP Ports

-----

1 Gi0/1(dynamic)

---

**Related Command(s)**

- `ip igmp snooping mrouter` - Configures statically the router ports for a VLAN
  - `ip igmp snooping mrouter-port -time-out` - Configures the router port purge time-out interval for a VLAN.
  - `ip igmp snooping mrouter-port-version` - Configures the operating version of the router port for a VLAN.
-



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## 23.44 show ip igmp snooping globals

<b>Command Objective</b>	This command displays IGMP snooping information for all VLANs or a specific VLAN for a given switch or for all switches (if switch is not specified).
<b>Syntax</b>	<code>show ip igmp snooping globals [switch &lt;switch_name&gt;]</code>
<b>Syntax</b>	<ul style="list-style-type: none"><li><code>switch &lt;switch_name&gt;</code> - Displays the specified context. This value represents unique name of the switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show ip igmp snooping globals Snooping Configuration ----- IGMP Snooping globally enabled IGMP Snooping is operationally enabled IGMP Snooping Enhanced mode is disabled Transmit Query on Topology Change globally disabled Multicast forwarding mode is MAC based Proxy globally disabled Proxy reporting globally enabled Filter is disabled Router port purge interval is 125 seconds Port purge interval is 260 seconds Report forward interval is 5 seconds Group specific query interval is 2 seconds Reports are forwarded on router ports Group specific query retry count is 2 Multicast VLAN disabled Leave config level is Vlan based</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><code>ip igmp snooping</code> - Enables IGMP snooping in the switch/a specific VLAN</li><li><code>ip igmp snooping proxy-reporting</code> - Enables proxy reporting in the IGMP snooping switch</li><li><code>snooping multicast-forwarding-mode</code> - Specifies the forwarding mode (IP based or MAC based) that will be effective on switch restart</li></ul>

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- `ip igmp snooping mrouter-port -time-out / ip igmp querier-timeout` - Sets the IGMP snooping router port purge time-out interval
  - `ip igmp snooping port-purge-interval / ip igmp snooping source-only learning age-timer` - Configures the IGMP snooping port purge time interval
  - `ip igmp snooping report-suppression interval` - Sets the IGMP report-suppression interval
  - `ip igmp snooping retry-count` - Sets the maximum number of group specific queries sent on a port on reception of a IGMPV2 leave message
  - `ip igmp snooping version` – Specifies the IGMP snooping operating mode of the switch
  - `ip igmp snooping report-forward` - Specifies if IGMP reports must be forwarded on all ports or router ports of a VLAN
  - `snooping leave-process config-level` - Specifies the level of configuring the leave processing mechanisms.
  - `ip igmp snooping enhanced-mode` - Enables/disables snooping system enhanced mode in the switch.
  - `ip igmp snooping multicast-vlan` - Enables/disables the multicast VLAN feature.
  - `mvr` - Enables the multicast VLAN feature. This command is applicable only for the code using industry standard commands
  - `ip igmp snooping filter` - Enables the IGMP snooping filter.
  - `ip igmp snooping proxy` – Enables proxy in the IGMP snooping switch.
  - `ip igmp snooping send-query` - Configures the IGMP general query transmission feature.
-

## 23.45 show ip igmp snooping

<b>Command Objective</b>	This command displays IGMP snooping information for all VLANs or a specific VLAN for a given context or for all the contexts (if no switch is specified).
<b>Syntax</b>	<pre>show ip igmp snooping [Vlan &lt;vlan-id/vfi-id&gt;] [switch &lt;switch_name&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>vlan &lt;vlan-id/vfi-id&gt;</b> - Displays IGMP snooping information for the specified VLAN / VFI ID. This value ranges between 1 and 65535.<ul style="list-style-type: none"><li>– <b>&lt;vlan -id&gt;</b> - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094</li><li>– <b>&lt;vfi-id&gt;</b> - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported.<ul style="list-style-type: none"><li> The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.</li><li> VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW.</li><li> The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.</li></ul></li></ul></li><li>• <b>switch &lt;switch_name&gt;</b> - Displays the specified context. This value represents unique name of the switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show ip igmp snooping vlan 2 Snooping VLAN Configuration for the VLAN 1 IGMP Snooping enabled IGMP configured version is V3 Fast leave is disabled Snooping switch is acting as Non-Querier Query interval is 125 seconds Port Purge Interval is 260 seconds</pre>

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Max Response Code is 100, Time is 10 seconds

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## Related Command(s)

- `ip igmp snooping` - Enables IGMP snooping in the switch/a specific VLAN
  - `ip igmp snooping version` - Specifies the IGMP snooping operating mode of switch
  - `ip igmp snooping port-purge-interval / ip igmp snooping source-only learning age-timer` - Configures the IGMP snooping port purge time interval
  - `ip igmp snooping fast-leave / ip igmp snooping vlan - immediate leave` - Enables fast leave processing and IGMP snooping for a specific VLAN
  - `ip igmp snooping querier` - Configures the IGMP snooping switch as a querier for a specific VLAN
  - `ip igmp snooping query-interval` - Sets the time period with which the general queries are sent by the IGMP snooping switch when configured as querier on a VLAN
  - `ip igmp snooping max-response-code` - Sets the maximum response code inserted in general queries send to host.
-

## 23.46 show ip igmp snooping - Redundancy




<b>Command Objective</b>	This command displays IGMP snooping information for all VLANs or a specific VLAN for a given switch or for all switches (if no switch is specified).
<b>Syntax</b>	<pre>show ip igmp snooping [Vlan &lt;vlan-id/vfi-id&gt;] [redundancy] [switch &lt;switch_name&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>vlan &lt;vlan-id/vfi-id&gt;</b> - Displays IGMP snooping information for the specified VLAN / VFI ID. This value ranges between 1 and 65535.<ul style="list-style-type: none"><li>– <b>&lt;vlan -id&gt;</b> - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094</li><li>– <b>&lt;vfi-id&gt;</b> - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported.<ul style="list-style-type: none"><li> The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.</li><li> VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW.</li><li> The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.</li></ul></li></ul></li><li>• <b>redundancy</b> - Displays the Synced Messages</li><li>• <b>switch &lt;switch_name&gt;</b> - Displays the specified context. This value represents unique name of the switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show ip igmp snooping redundancy IGMP Snooping VLAN Configuration for VLAN 1 IGMP snooping switch is acting as Non-Querier IGMP current operating version is V1</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>ip igmp snooping</b> - Enables IGMP snooping in the switch/a specific VLAN</li></ul>

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- `ip igmp snooping version` - Specifies the IGMP snooping operating mode of switch
  - `ip igmp snooping fast-leave` / `ip igmp snooping vlan - immediate leave` - Enables fast leave processing and IGMP snooping for a specific VLAN
  - `ip igmp snooping querier` - Configures the IGMP snooping switch as a querier for a specific VLAN
  - `ip igmp snooping query-interval` - Sets the time period with which the general queries are sent by the IGMP snooping switch when configured as querier on a VLAN
-

## 23.47 show ip igmp snooping groups

<b>Command Objective</b>	This command displays IGMP group information for all VLANs or a specific VLAN or specific VLAN and group address for a given switch or for all switch (if no switch is specified) . It also displays the information for static / dynamic or both types of multicast entries.
<b>Syntax</b>	<code>show ip igmp snooping groups [Vlan &lt;vlan-id/vfi-id&gt; [Group &lt;Address&gt;]] [{static   dynamic}][switch &lt;switch_name&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>Vlan &lt;vlan-id/vfi-id&gt;</b> - Displays IGMP snooping group information for the specified VLAN / VFI ID. This value ranges between 1 and 65535. <ul style="list-style-type: none"> <li>– <b>&lt;vlan -id&gt;</b> - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094</li> <li>– <b>&lt;vfi-id&gt;</b> - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported. <ul style="list-style-type: none"> <li> The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.</li> <li> VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW .</li> <li> The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.</li> </ul> </li> </ul> </li> <li>• <b>Group &lt;Address&gt;</b> - Displays the Group Address of the VLAN ID</li> <li>• <b>static</b> - Displays only static multicast entries</li> <li>• <b>dynamic</b> - Displays only dynamic multicast entries. If not specified, both static and dynamic entries are displayed</li> <li>• <b>switch &lt;switch_name&gt;</b> - Displays the specified context. This value represents unique name of the switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.</li> </ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<b>Single Instance</b>

# Supermicro Switch Configuration CLI Guide

---

**/\* IP based \*/**

Your Product# **show ip igmp snooping groups**

IGMP Snooping Group information

-----

VLAN ID:2 Group Address: 227.1.1.1

Filter Mode: EXCLUDE

Exclude sources: None

V1/V2 Receiver Ports:

Gi0/4

V3 Receiver Ports:

Port Number: Gi0/2

Include sources: None

Exclude sources:

12.0.0.10, 12.0.0.20

Port Number: Gi0/3

Include sources: None

Exclude sources:

12.0.0.40, 12.0.0.30

**/\* MAC based \*/**

Your Product# **show ip igmp snooping groups**

IGMP Snooping Group information

-----

VLAN ID:2 Group Address: 227.1.1.1

Filter Mode: EXCLUDE

Exclude sources: None

Receiver Ports:

Gi0/2, Gi0/3, Gi0/4, Gi0/5




---

## Related Command(s)

- **ip igmp snooping static-group** - Configure IGMP snooping static multicast for Vlan(s)



## 23.48 show ip igmp snooping forwarding-database

<b>Command Objective</b>	This command displays multicast forwarding entries for all VLANs or a specific VLAN for a given switch or for all switches (if no switch is specified). It also displays the information for static / dynamic or both types of multicast entries.
<b>Syntax</b>	<code>show ip igmp snooping forwarding-database [Vlan &lt;vlan-id/vfi-id&gt;] [{static   dynamic}] [switch &lt;switch_name&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>Vlan &lt;vlan-id/vfi-id&gt;</b> - Displays multicast forwarding entries for the specified VLAN / VFI ID. This value ranges between 1 and 65535. <ul style="list-style-type: none"> <li>– <b>&lt;vlan -id&gt;</b> - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094</li> <li>– <b>&lt;vfi-id&gt;</b> - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported. <ul style="list-style-type: none"> <li> The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.</li> <li> VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW.</li> <li> The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.</li> </ul> </li> </ul> </li> <li>• <b>Static</b> - Display the static multicast forwarding entries.</li> <li>• <b>Dynamic</b> - Display the dynamic multicast forwarding entries. If not specified, both static and dynamic entries are displayed</li> <li>• <b>switch &lt;switch_name&gt;</b> - Displays the specified context. This value represents unique name of the switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.</li> </ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<p><b>Single Instance</b></p> <pre>/* IP based */</pre>

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---

```
Your Product# show ip igmp snooping forwarding-database static
```

```
Vlan Source Address Group Address Ports
-----
2      12.0.0.10      227.1.1.1 Gi0/1, Gi0/3, Gi0/4
2      12.0.0.20      227.1.1.1 Gi0/1, Gi0/3, Gi0/4
2      12.0.0.30      227.1.1.1 Gi0/1, Gi0/2, Gi0/4
2      12.0.0.40      227.1.1.1 Gi0/1, Gi0/2, Gi0/
```

**/\* MAC based \*/**

```
Your Product# show ip igmp snooping forwarding-database
```

```
Vlan MAC-Address Ports
-----
2 01:00:5e:01:01:01 Gi0/2, Gi0/3, Gi0/4, Gi0/5
2 01:00:5e:02:02:02 Gi0/2, Gi0/3
```




---

## Related Command(s)

- **ip igmp snooping** - Enables IGMP snooping in the switch/a specific VLAN
  - **ip igmp snooping proxy-reporting** – Enables proxy reporting in the IGMP snooping switch
  - **ip igmp snooping version** - Configures the operating version of the IGMP snooping switch for a specific VLAN
  - **ip igmp snooping static-group** - Configure IGMP snooping static multicast for Vlan(s) By default, both static and dynamic entries are displayed
-

## 23.49 show ip igmp snooping forwarding-database - Redundancy

---

<b>Command Objective</b>	This command displays multicast forwarding entries for all VLANs or a specific VLAN for a given switch or for all switches (if no switch is specified). It also displays the information for static / dynamic or both types of multicast entries.
<b>Syntax</b>	<pre>show ip igmp snooping forwarding-database [Vlan &lt;vlan-id/vfi-id&gt;] [{static   dynamic}] [redundancy] [switch &lt;switch_name&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>Vlan &lt;vlan-id/vfi-id&gt;</b> - Displays multicast forwarding entries for the specified VLAN / VFI ID. This value ranges between 1 and 65535.<ul style="list-style-type: none"><li>– <b>&lt;vlan -id&gt;</b> - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094</li><li>– <b>&lt;vfi-id&gt;</b>. - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported.<ul style="list-style-type: none"><li> The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.</li><li> VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW.</li><li> The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.</li></ul></li></ul></li><li>• <b>static</b> - Display the static multicast forwarding entries.</li><li>• <b>dynamic</b> - Display the dynamic multicast forwarding entries. If not specified, both static and dynamic entries are displayed</li><li>• <b>redundancy</b> - Displays the Synced Messages.</li><li>• <b>switch &lt;switch_name&gt;</b> - Displays the specified context. This value represents unique name of the switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode

---

# Supermicro Switch Configuration CLI Guide

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## Example

```
Your Product# show ip igmp snooping forwarding-database  
redundancy
```

```
Igs Redundancy Multicast Group Info Sync Data
```

```
Vlan   Group Address  Ports
```

```
-----
```




```
1      224.1.1.1  Gi0/2, Gi0/3
```

```
1      224.1.2.3  Gi0/1, Gi0/3
```

## Related Command(s)

- **ip igmp snooping** - Enables IGMP snooping in the switch/a specific VLAN
  - **ip igmp snooping proxy-reporting** – Enables proxy reporting in the IGMP snooping switch
  - **ip igmp snooping version** - Configures the operating version of the IGMP snooping switch for a specific VLAN
  - **ip igmp snooping static-group** - Configure IGMP snooping static multicast for Vlan(s) By default, both static and dynamic entries are displayed
-

## 23.50 show ip igmp snooping statistics

<b>Command Objective</b>	This command displays IGMP snooping statistics for all VLANs or a specific VLAN for a given switch or for all switches (if no switch is specified).
<b>Syntax</b>	<code>show ip igmp snooping statistics [Vlan &lt;vlan-id/vfi-id&gt;] [switch &lt;switch_name&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li> <b>vlan &lt;vlan-id/vfi-id&gt;</b> - Displays IGMP snooping statistics for the specified VLAN / VFI ID. This value ranges between 1 and 65535. <ul style="list-style-type: none"> <li><b>&lt;vlan -id&gt;</b> - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094</li> <li><b>&lt;vfi-id&gt;</b> - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported. <ul style="list-style-type: none"> <li> The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.</li> <li> VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW.</li> <li> The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.</li> </ul> </li> </ul> </li> <li> <b>switch &lt;switch_name&gt;</b> - Displays the IGMP snooping statistics for specified context. This value represents unique name of the switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature. </li> </ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show ip igmp snooping statistics IGMP Snooping Statistics for VLAN 1 IGMP Snooping General queries received : 3 IGMP Snooping Group specific queries received : 0 IGMP Snooping Group and source specific queries received : 0 IGMP Snooping V1/V2 reports received : 10 IGMP Snooping V3 reports received : 0</pre>

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```
IGMP Snooping V3 IS_INCLUDE messages received : 0
IGMP Snooping V3 IS_EXCLUDE messages received : 0
IGMP Snooping V3 TO_INCLUDE messages received : 0
IGMP Snooping V3 TO_EXCLUDE messages received : 0
IGMP Snooping V3 ALLOW messages received : 0
IGMP Snooping V3 Block messages received : 0
IGMP Snooping V2 Leave messages received : 0
IGMP Snooping General queries transmitted : 0
IGMP Snooping Group specific queries transmitted : 2
IGMP Snooping V1/V2 reports transmitted : 0
IGMP Snooping V3 reports transmitted : 3
IGMP Snooping V2 leaves transmitted : 0
IGMP Snooping Packets dropped : 1
```

---





## Related Command(s)

- `ip igmp snooping` - Enables IGMP snooping in the switch/a specific VLAN
-

## 23.51 show ip igmp snooping blocked-router

<b>Command Objective</b>	This command displays the blocked router ports for all VLANs or a specific VLAN for a given switch or for all the switches (if no switch is specified).
<b>Syntax</b>	<code>show ip igmp snooping blocked-router [Vlan &lt;vlan-id/vfi-id&gt;] [switch &lt;switch_name&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li> <b>vlan &lt;vlan-id/vfi-id&gt;</b> - Displays the blocked router ports for the specified VLAN / VFI ID. This value ranges between 1 and 65535. <ul style="list-style-type: none"> <li><b>&lt;vlan -id&gt;</b> - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094</li> <li><b>&lt;vfi-id&gt;</b> - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported. <ul style="list-style-type: none"> <li> The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.</li> <li> VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW.</li> <li> The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.</li> </ul> </li> </ul> </li> <li> <b>switch &lt;switch_name&gt;</b> - Displays the blocked router ports for specified context. This value represents unique name of the switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature. </li> </ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show ip igmp snooping blocked-router Vlan  Ports ----  - 1     Gi0/1, Gi0/2, Gi0/3, Gi0/4 2     Gi0/6, Gi0/7, Gi0/8</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><b>ip igmp snooping blocked-router</b> – Configures statically the blocked router ports for a VLAN.</li> </ul>

## 23.52 show ip igmp snooping multicast-receivers

<b>Command Objective</b>	This command displays IGMP multicast host information for all VLANs or a specific VLAN or specific VLAN and group address for a given switch or for all switches (if no switch is specified).
<b>Syntax</b>	<code>show ip igmp snooping multicast-receivers [Vlan &lt;vlan-id/vfi-id&gt; [Group &lt;Address&gt;]] [switch &lt;switch_name&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>Vlan &lt;vlan-id/vfi-id&gt;</b> - Displays the displays IGMP multicast host information for the specified VLAN / VFI ID. This value ranges between 1 and 65535.<ul style="list-style-type: none"><li>– <b>&lt;vlan -id&gt;</b> - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094</li><li>– <b>&lt;vfi-id&gt;</b> - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported.<ul style="list-style-type: none"><li> The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.</li><li> VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW.</li><li> The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.</li></ul></li></ul></li><li>• <b>Group</b> - Displays IGMP multicast host information for the Multicast group address.</li><li>• <b>switch &lt;switch_name&gt;</b> - Displays IGMP multicast host information for the specified context. This value represents unique name of the switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
	<ul style="list-style-type: none"><li>• IGMP snooping must be enabled in the switch.</li><li>• The port leave mode for an interface must be set as exp-hosttrack</li></ul>
	<pre>Your Product# show ip igmp snooping multicast-receivers Snooping Receiver Information</pre>



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## Example

```
-----  
VLAN ID: 1 Group Address: 225.0.0.10  
Receiver Port: Gi0/2  
Attached Hosts: 12.0.0.10  
Exclude Sources: None  
VLAN ID: 1 Group Address: 225.0.0.20  
Receiver Port: Gi0/2  
Attached Hosts: 12.0.0.20  
Include Sources: 14.0.0.10  
Receiver Port: Gi0/4  
Attached Hosts: 12.0.0.40  
Include Sources: 14.0.0.20
```

## Related Command(s)

- `ip igmp snooping` - Enables IGMP snooping in the switch/a specific VLAN
  - `ip igmp snooping leavemode exp-hosttrack` - Processes the leave messages using the explicit host tracking mechanism.
-

# Supermicro Switch Configuration CLI Guide

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## 23.53 show ip igmp snooping port-cfg

<b>Command Objective</b>	This command displays IGS Port configuration information for all Inner VLANs or a specific Inner VlanId or a given switch.
<b>Syntax</b>	<pre>show ip igmp snooping port-cfg [{interface &lt;interface-type&gt; &lt;interface-id&gt; [InnerVlanId vlan-id(1-4094)]   switch &lt;switch_name&gt;}]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>interface&lt;interface-type&gt; &lt;interface-id&gt;</b> - Displays IGS Port configuration information for the the interface type and interface identifier. The details to be provided are:<ul style="list-style-type: none"><li>– <b>&lt;interface-type&gt;</b> - Sets the type of interface. The interface can be:<ul style="list-style-type: none"><li>▪ qx-ethernet – A version of Ethernet that supports data transfer up to 40 Gigabits per second. This Ethernet supports only full duplex links.</li><li>▪ gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.</li><li>▪ extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.</li></ul></li><li>– <b>&lt;interface-id&gt;</b> - Sets the interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash, for interface type other than i-lan. Only i-lan ID is provided, for interface type i-lan.</li></ul></li><li>• <b>InnerVlanId vlan-id(1-4094)</b> - Displays the IGS Port configuration information for the Inner VLAN identifier. This value ranges between 1 and 4094.</li><li>• <b>switch &lt;switch_name&gt;</b> - Displays the IGS Port configuration information for the specified context. This value represents unique name of the switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature..</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show ip igmp snooping port-cfg Snooping Port Configurations ----- Snooping Port Configuration for Port 2 Leave Process mode is Normal Leave Rate limit on the interface is 100 Max limit Type is Groups</pre>

```
Max limit is 20
Current member count is 0
Profile Id is 0
Snooping Port Configuration for Port 3
Leave Process mode is Fast Leave
Rate limit on the interface is -1
Max limit Type is Channels
Max limit is 500
Current member count is 0
Profile Id is 0

Your Product# show ip igmp snooping port-cfg interface
gigabitethernet 0/2
Snooping Port Configurations
-----
Snooping Port Configuration for Port 2
Leave Process mode is Normal Leave
Rate limit on the interface is 100
Max limit Type is Groups
Max limit is 20
Current member count is 0
Profile Id is 0
```

---

**Related Command(s)**

- **ip igmp snooping leavemode** – Configures the port leave mode for an interface.
  - **ip igmp snooping ratelimit** – Configures the rate limit for a downstream interface in units of the number of IGMP packets per second.
  - **ip igmp snooping limit** – Configures the maximum limit type for an interface.
  - **ip igmp snooping filter-profileId** – Configures the multicast profile index for a downstream interface.
-

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## 23.54 show ip igmp snooping multicast-vlan

<b>Command Objective</b>	This command displays multicast VLAN statistics in a switch and displays various profiles mapped to the multicast VLANs.
<b>Syntax</b>	<code>show ip igmp snooping multicast-vlan [switch &lt;switch_name&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li><code>switch &lt;switch_name&gt;</code> - Displays multicast VLAN statistics for the specified context. This value represents unique name of the switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show ip igmp snooping multicast-vlan Multicast VLAN Statistics ===== ----- Multicast VLAN disabled Profile ID -- Multicast VLAN ----- -- -----       1      --      1       2      --      2 ----- -- -----</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><code>ip igmp snooping multicast-vlan</code> – Enables/disables the multicast VLAN feature.</li><li><code>mvr</code> - Enables the multicast VLAN feature. This command is applicable only for the code using industry standard commands.</li></ul>

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## 23.55 ip igmp snooping clear counters

<b>Command Objective</b>	This command clears the IGMP snooping statistics maintained for Vlan(s).
<b>Syntax</b>	<code>ip igmp snooping clear counters [Vlan &lt;vlan-id/vfi-id&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>Vlan &lt;vlan-id/vfi-id&gt;</b> - Clears the IGMP snooping statistics maintained for the specified VLAN / VFI ID. This value ranges between 1 and 65535.<ul style="list-style-type: none"><li>– <b>&lt;vlan -id&gt;</b> - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094</li><li>– <b>&lt;vfi-id&gt;</b> - VFI ID is a VLAN created in the system which contains Pseudo wires and Attachment Circuits as member ports . This creates a logical LAN for the VPLS service. This value ranges between 4096 and 65535. This interface type is not supported.<ul style="list-style-type: none"><li> The VLAN ID 4095 is reserved and may be used to indicate a wildcard match for the VID in management operations or Filtering Database entries.</li><li> VFI IDs 4096 and 4097 are reserved identifiers used in MPLS PW.</li><li> The theoretical maximum for the maximum number of VFI is 65535 but the actual number of VFI supported is a sizing constant. Based on this, the maximum number of VFI ID accepted in the management interface is restricted. For example if 100 VFIs are supported, the maximum number of VFI supported will be restricted to maximum number of VLANs + 100. An error message is displayed for any value beyond this range.</li></ul></li></ul></li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Example</b>	<pre>Your Product(config)# ip igmp snooping clear counters vlan 4094</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip igmp snooping retry-count</code> - Sets the maximum number of group specific queries sent by the switch.</li><li>• <code>ip igmp snooping startup-query-count</code> - Sets the maximum number of general query messages sent out on switch startup, when the switch is configured as a querier.</li></ul>

## 23.56 ip igmp snooping send-query

<b>Command Objective</b>	This command configures the IGMP general query transmission feature upon the topology change in the switch.
<b>Syntax</b>	<code>ip igmp snooping send-query { enable   disable }</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>enable</b> - Enables the snooping query transmission status which generates IGMP query messages.</li><li>• <b>disable</b> - Disables the snooping query transmission status which stops the switch from generating IGMP query messages.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Example</b>	<code>Your product(config)# ip igmp snooping send-query enable</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show ip igmp snooping globals</code> - Displays IGMP snooping information for all/specified VLAN(s).</li></ul>

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## 23.57 ip igmp snooping static-group

<b>Command Objective</b>	<p>This command configures IGMP snooping static multicast in the multicast switch</p> <p>This no form of the command removes the IGMP snooping static multicast in the multicast switch</p>
<b>Syntax</b>	<pre>ip igmp snooping static-group &lt;mcast_addr&gt; ports &lt;ifXtype&gt; &lt;iface_list&gt;</pre> <pre>no ip igmp snooping static-group &lt;mcast_addr&gt;</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;mcast_addr&gt;</b> - Configures the Multicast Address. This value ranges between 225.0.0.0. and 239.255.255.255</li><li>• <b>&lt;ifXtype&gt;</b> - Configures snooping static multicast for the specified type of interface. The interface can be:<ul style="list-style-type: none"><li>– qx-ethernet – A version of Ethernet that supports data transfer upto 40 Gigabits per second. This Ethernet supports only full duplex links.</li><li>– gigabitethernet – A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.</li><li>– extreme-ethernet – A version of Ethernet that supports data transfer upto 10 Gigabits per second. This Ethernet supports only full duplex links.</li><li>– port-channel – Logical interface that represents an aggregator which contains several ports aggregated together.</li></ul></li><li>• <b>&lt;iface list&gt;</b> - Configures snooping static multicast for the list of interfaces or a specific interface identifier. This value is a combination of slot number and port number separated by a slash, for interface type other than port-channel. Only port-channel ID is provided, for interface type port-channel. Use comma as a separator without space while configuring list of interfaces. Example: 0/1, 0/3 or 1, 3.</li></ul>
<b>Mode</b>	Config-VLAN Mode
<b>Example</b>	<pre>Your Product (config-vlan)# ip igmp snooping static-group 225.3.2.2 ports gigabitethernet 0/2</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>snooping multicast-forwarding-mode</b>- Specifies the snooping multicast forwarding mode</li><li>• <b>show ip igmp snooping forwarding-database static</b> – Displays static forwarding entries</li></ul>

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## CHAPTER : IGMP SNOOPING

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- `show ip igmp snooping groups static`– Displays IGMP group information
-



## Chapter

# 24

## RMON

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RMON (Remote Monitoring) is a standard monitoring specification that enables various network monitors and console systems to exchange network-monitoring data.

The RMON specification defines a set of statistics and functions that can be exchanged between RMON-compliant console managers and network probes. As such, RMON provides network administrators with comprehensive network-fault diagnosis, planning, and performance-tuning information.

The list of CLI commands for the configuration of RMON is as follows:

- [set rmon](#)
- [rmon collection history](#)
- [rmon collection stats](#)
- [rmon event](#)
- [rmon alarm](#)
- [show rmon](#)


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## 24.1 set rmon

<b>Command Objective</b>	This command is used to enable or disable the RMON feature.
<b>Syntax</b>	<code>set rmon {enable   disable}</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>enable</b> - Enables the RMON feature in the system. On enabling, the RMON starts monitoring the networks both local and remote and provides network fault diagnosis</li><li>• <b>disable</b> - Disables the RMON feature in the system. On disabling, the RMON's network monitoring is called off.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	Disabled
<b>Example</b>	<code>Your Product(config)# set rmon enable</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show rmon</code> - Displays the RMON statistics, alarms, events, and history configured on the interface</li></ul>

## 24.2 rmon collection history

<b>Command Objective</b>	This command enables history collection of interface/ VLAN statistics in the buckets for the specified time interval.
	The no form of the command disables the history collection on the interface/VLAN.
<b>Syntax</b>	<pre>rmon collection history &lt;index (1-65535)&gt; [buckets &lt;bucket-number (1-65535)&gt;] [interval &lt;seconds (1-3600)&gt;] [owner &lt;ownername (127)&gt;]  no rmon collection history &lt;index (1-65535)&gt;</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>&lt;index (1-65535)&gt;</b> - Identifies an entry in the history control table. Each such entry defines a set of samples at a particular interval for an interface on the device. This value ranges between 1 and 65535.</li> <li>• <b>buckets&lt;bucket-number (1-65535)&gt;</b> - Configures the number of buckets desired for the RMON collection history group of statistics. This is the requested number of discrete time intervals over which data is to be saved in the part of the media-specific table associated with this History Control Entry. The polling cycle is the bucket interval where the interface statistics details are stored. This value ranges between 1 and 65535.</li> <li>• <b>interval&lt;seconds (1-3600)&gt;</b> - Configures the time interval over which the data is sampled for each bucket. The value ranges between 1 and 3600.</li> <li>• <b>owner&lt;ownername (127)&gt;</b> - Configures the name of the owner of the RMON group of statistics</li> </ul>
<b>Mode</b>	Interface Configuration Mode / Config VLAN Mode
<b>Default</b>	<ul style="list-style-type: none"> <li>• bucket number - 50</li> <li>• interval - 1800 seconds</li> </ul>
	In Config VLAN Mode, this command executes only if either VLAN is set as active or if the member ports are associated with the VLAN.
<b>Example</b>	<p><b>Interface Configuration Mode</b></p> <pre>Your Product(config) interface gigabitethernet 0/1 Your Product(config-if)# rmon collection history 1 buckets 2 interval 20</pre>

# Supermicro Switch Configuration CLI Guide

---

---

## Config VLAN Mode

Your Product(config) vlan 1

Your Product(config-vlan) rmon collection history 2


---

### Related Command(s)

- `vlan active` - Activates a VLAN in the switch.
  - `ports` - Configures a VLAN entry with the required member ports, untagged ports and/or forbidden ports, and activates the VLAN.
  - `show rmon` - Displays the history collection for the configured bucket
-

## 24.3 rmon collection stats

---

<b>Command Objective</b>	<p>This command enables RMON statistic collection on the interface/ VLAN.</p> <p>The no form of the command disables RMON statistic collection on the interface/ VLAN.</p>
<b>Syntax</b>	<pre>rmon collection stats &lt;index (1-65535)&gt; [owner &lt;ownername (127)&gt;]  no rmon collection stats &lt;index (1-65535)&gt;</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>&lt;index (1-65535)&gt;</b> - Identifies an entry in the statistics table.. This value ranges between 1 and 65535.</li><li>• <b>owner &lt;ownername (127)&gt;</b> - Configures the the name of the owner of the RMON group of statistics</li></ul>
<b>Mode</b>	Interface Configuration Mode / Config VLAN Mode
	In Config VLAN Mode, this command executes only if either VLAN is set as active or if the member ports are associated with the VLAN.
<b>Example</b>	<p><b>Interface Configuration Mode</b></p> <pre>Your Product(config) interface gigabitethernet 0/1 Your Product(config-if)# rmon collection stats 1</pre> <p><b>Config VLAN Mode</b></p> <pre>Your Product(config) vlan 1 Your Product(config-vlan) rmon collection stats 2</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>vlan active</b> - Activates a VLAN in the switch.</li><li>• <b>ports</b>- Configures a VLAN entry with the required member ports, untagged ports and/or forbidden ports, and activates the VLAN.</li><li>• <b>show rmon</b> - Displays the RMON collection statistics</li></ul>

---

# Supermicro Switch Configuration CLI Guide

---

## 24.4 rmon event

---

**Command Objective** This command adds an event to the RMON event table. The added event is associated with an RMON event number.

The no form of the command deletes an event from the RMON event table.

---

**Syntax**

```
rmon event <number (1-65535)> [description <event-  
description (127)>] [log] [owner <ownername (127)>] [trap  
<community (127)>]
```

```
no rmon event <number (1-65535)>
```

---

**Parameter Description**

- **<number (1-65535)>** - Sets the number of events to be added in the event table. This value ranges between 1 and 65535.
- **description<event-description (127)>** - Provides a description for the event. This value is a string with a maximum length of 127.
- **log** - Creates an entry in the log table for each event.
- **owner<ownername (127)>** - Displays the entity that are configured this entry. This value is a string with a maximum value of 127.
- **trap<community (127)>** - Generates a trap, The SNMP community string is to be passed for the specified trap. This value is a string with a maximum value of 127.

---

**Mode** Global Configuration Mode

---

**Example** Your Product(config)# rmon event 1 log owner aricent trap netman

---

**Related Command(s)**

- **rmon alarm** - Sets an alarm on a MIB object
- **show rmon** - Displays the RMON events (show rmon events)
- **show snmp community** - Configures the SNMP community details

---

## 24.5 rmon alarm

**Command Objective** This command sets an alarm on a MIB object. The Alarm group periodically takes statistical samples from variables in the probe and compares them to thresholds that have been configured.

The no form of the command deletes the alarm configured on the MIB object.

**Syntax**

```
rmon alarm <alarm-number> <mib-object-id (255)> <sample-  
interval-time (1-65535)> {absolute | delta} rising-  
threshold <value (0-2147483647)> [rising-event-number (1-  
65535)] falling-threshold <value (0-2147483647)> [falling-  
event-number (1-65535)] [owner <ownername (127)>]
```

```
no rmon alarm <number (1-65535)>
```

**Parameter Description**

- **<alarm-number>/ <number (1-65535)>** - Displays the value of the statistic during the last sampling period. This value remains available until the current sampling period is completed. For example, if the sample type is deltaValue, this value will be the difference between the samples at the beginning and end of the period. If the sample type is absoluteValue, this value will be the sampled value at the end of the period. This value is compared with the rising and falling thresholds. The value ranges between 1 and 65535.
- **<mib-object-id (255)>** - Identifies the mib object.
- **<sample-interval-time (1-65535)>** - Identifies an entry in the alarm table. Each such entry defines a diagnostic sample at a particular level for a MIB object in the device. This value ranges between 1 and 65535 seconds.
- **absolute** - Compares the value of the selected variable with the thresholds at the end of the sampling interval.
- **delta** - Subtracts the value of the selected variable at the last sample from the current value, and the difference is compared with the thresholds at the end of the sampling interval.
- **rising-threshold <value (0-2147483647)>** - Configures the rising threshold value. If the startup alarm is set as Rising alarm or RisingOrFalling alarm and if the configured threshold value is reached, then an alarm is raised. When the current sampled value is greater than or equal to the configured Rising threshold, and the value at the last sampling interval is less than this configured threshold, a single event will be generated. The value ranges between 0 and 2147483647.
- **<rising-event-number (1-65535)>** - Raises the index of the event, when the Rising threshold is reached. The event entry identified by a particular value of this index is the same as identified by the same value of the event index object. This value ranges between 1 and 65535.

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---

- **falling-threshold <value (0-2147483647)>** - Configures the falling threshold value. If the startup alarm is set as Falling alarm or RisingOrFalling alarm and if the configured threshold value is reached, then an alarm is raised. When the current sampled value is lesser than or equal to the configured Falling threshold, and the value at the last sampling interval is greater than this threshold, a single event will be generated. This value ranges between 0 and 2147483647
- **<falling-event-number (1-65535)>** - Raises the index of the event when the Falling threshold is reached. The event entry identified by a particular value of this index is the same as identified by the same value of the event index object. This value ranges between 1 and 65535.
- **owner<ownername (127)>** - Sets the entity that are configured this entry.

---

**Mode** Global Configuration Mode

---

**Default** By default, the least event number in the event table is assigned for the rising and falling threshold as its event number.



- RMON events must have been configured
- RMON collection stats must be configured
- In SMIS, we cannot monitor all the mib objects through RMON. This will be applicable only to the Ethernet interfaces and VLANs

---

**Example**

```
Your Product(config)# rmon alarm 4
1.3.6.1.6.3.16.1.2.1.4.1.4.110.111.110.101 2 absolute
rising-threshold 2 2 falling-threshold 1 2 owner Aricent
```

---

**Related Command(s)**

- **rmon collection stats** - Enables RMON statistic collection on the interface
- **rmon event** - Adds an event to the RMON event table
- **show rmon** - Displays the RMON alarms (show rmon alarms)

---



## 24.6 show rmon

<b>Command Objective</b>	This command displays the RMON statistics, alarms, events, and history configured on the interface.
<b>Syntax</b>	<code>show rmon [statistics [&lt;stats-index (1-65535)&gt;]] [alarms] [events] [history [history-index (1-65535)] [overview]]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li><b>statistics</b> - Displays a collection of statistics for a particular Ethernet Interface. The probe for each monitored interface on this device measures the statistics.</li> <li><b>alarms</b> - Displays the value of the statistic during the last sampling period. This value remains available until the current sampling period is completed.</li> <li><b>events</b> - Generates events whenever an associated condition takes place in the device. The Conditions may be alarms. Alarms are generated when a sampled statistical variable value exceeds the defined threshold value. Alarm module calls events module</li> <li><b>history</b> - Displays the history of the configured RMON</li> <li><b>overview</b> - Displays only the overview of rmon history entries</li> </ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show rmon statistics RMON is enabled Collection 4 on Vlan 1 is active, and owned by monitor, Monitors Vlan 1 which has Received 0 octets, 0 packets, 0 broadcast and 0 multicast packets, 0 undersized and 0 oversized packets, 0 fragments and 0 jabbers, 0 CRC alignment errors and 0 collisions. 0 out FCS errors, # of packets received of length (in octets): 64: 0, 65-127: 0, 128-255: 0, 256-511: 0, 512-1023: 0, 1024-1518: 0 Collection 45 on Gi0/1 is active, and owned by monitor, Monitors ifEntry.1.1 which has Received 0 octets, 0 packets,</pre>

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---

```
0 broadcast and 0 multicast packets,
0 undersized and 0 oversized packets,
0 fragments and 0 jabbers,
0 CRC alignment errors and 0 collisions.
0 out FCS errors,
# of packets received of length (in octets):
64: 0, 65-127: 0, 128-255: 0,
256-511: 0, 512-1023: 0, 1024-1518: 0
Collection 56 on Vlan 5 is active, and owned by monitor,
Monitors Vlan 5 which has
Received 0 octets, 0 packets,
0 broadcast and 0 multicast packets,
0 undersized and 0 oversized packets,
0 fragments and 0 jabbers,
0 CRC alignment errors and 0 collisions.
0 out FCS errors,
# of packets received of length (in octets):
64: 0, 65-127: 0, 128-255: 0,
256-511: 0, 512-1023: 0, 1024-1518: 0
Number of statistics collection on interface: 1
Number of statistics collection on Vlan      : 2

Your Product# show rmon
RMON is enabled

Your Product# show rmon history
RMON is disabled
Entry 1 is active, and owned by monitor Monitors
ifEntry.1.2 every 1800 second(s) Requested # of
time intervals, ie buckets, is 50, Granted # of
time intervals, ie buckets, is 50,
Entry 4 is active, and owned by monitor
Monitors Vlan 40 every 1800 second(s)
Requested # of time intervals, ie buckets, is 50,
Granted # of time intervals, ie buckets, is 50,
Number of history collection on interface: 1
Number of history collection on Vlan      : 1
```

---

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**Your Product# show rmon events**

```
RMON is enabled
Event 1 is active, owned by
  Description is
  Event firing causes nothing,
  Time last sent is Aug 27 18:30:01 2009
Event 2 is active, owned by
  Description is
  Event firing causes nothing,
  Time last sent is Aug 27 18:31:36 2009
```

**Your Product# show rmon alarms**

```
RMON is enabled
Alarm 4 is active, owned by Aricent
  Monitors 1.3.6.1.6.3.16.1.2.1.4.1.4.110.111.110.101 every
  2 second(s)
  Taking absolute samples, last value was 3
  Rising threshold is 2, assigned to event 2
  Falling threshold is 1, assigned to event 2
  On startup enable rising or falling alarm
```

**Your Product# show rmon statistics 2 alarms events history 1**

```
RMON is enabled
Collection 2 on Ex0/1 is active, and owned by monitor,
  Monitors ifEntry.1.1 which has
  Received 5194 octets, 53 packets,
  0 broadcast and 0 multicast packets,
  0 undersized and 0 oversized packets,
  0 fragments and 0 jabbers,
  53 CRC alignment errors and 0 collisions.
  # of packets received of length (in octets):
  64: 0, 65-127: 53, 128-255: 0,
  256-511: 0, 512-1023: 0, 1024-1518: 0
Alarm 4 is active, owned by Aricent
  Monitors 1.3.6.1.6.3.16.1.2.1.4.1.4.110.111.110.101 every
  2 second(s)
  Taking absolute samples, last value was 3
  Rising threshold is 2, assigned to event 2
```

---

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---

---

```
Falling threshold is 1, assigned to event 2
On startup enable rising or falling alarm
```

```
Event 1 is active, owned by
Description is
Event firing causes nothing,
Time last sent is Aug 27 18:30:01 2009
```

```
Event 2 is active, owned by
Description is
Event firing causes nothing,
Time last sent is Aug 27 18:31:36 2009
```

**Your Product# show rmon history overview**

```
RMON is enabled
Entry 1 is active, and owned by monitor Monitors
ifEntry.1.2 every 1800 second(s) Requested # of
time intervals, ie buckets, is 50, Granted # of
time intervals, ie buckets, is 50,
Entry 4 is active, and owned by monitor
Monitors Vlan 40 every 1800 second(s)
Requested # of time intervals, ie buckets, is 50,
Granted # of time intervals, ie buckets, is 50,
Number of history collection on interface: 1
Number of history collection on Vlan : 1
```

---

## Related Command(s)

- **set rmon** - Enables or disables the RMON feature
  - **rmon collection history** - Enables history collection of interface/VLAN statistics in the buckets for the specified time interval
  - **rmon collection stats** - Enables RMON statistic collection on the interface/VLAN
  - **rmon event** - Adds an event to the RMON event table
  - **rmon alarm** - Sets an alarm on a MIB object
-

## Chapter 25

### RMON2

---

RMONv2 is an extension of the RMON that deals with the information at the physical and data link network levels to support monitoring and protocol analysis of LANs. RMONv2 adds support for network and application layer monitoring.

RMONv2 is a portable implementation of Remote Network Monitoring version 2. RMONv2 is implemented with nine RMON Mib groups. They are Protocol directory, Protocol distribution, Address Map, Network Layer Host, Network Layer Matrix, Application Layer Host, Application layer Matrix, User History collection and Probe configuration groups. RMONv2 provides extensions to four RMONv1 tables. They are: etherStats table, historyControl table, hostControl table and matrixControl table. RMON should be enabled for configuring the RMONv1 tables

The list of CLI commands for the configuration of RMON2 is as follows:

- [rmon2](#)
- [debug rmon2](#)

# Supermicro Switch Configuration CLI Guide

---

## 25.1 rmon2

---

<b>Command Objective</b>	This command enables / disables RMON2 module in the switch. RMON2 lists the inventory of protocols, lists MAC address to network address bindings, tracks the amount of traffic between network addresses and so on. The default value is disabled.
<b>Syntax</b>	<code>rmon2 {enable   disable}</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>enable</b> - Enables the RMON2 module in the switch. Resources are allocated to the module.</li><li>• <b>disable</b> - Disables the RMON2 module in the switch. Resources allocated are released back to the system.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Default</b>	disabled
<b>Example</b>	<code>Your Product(config)# rmon2 enable</code>

---

## 25.2 debug rmon2

---

**Command Objective** This command configures various RMON2 debug trace messages.

The no form of the command disables the debug feature for RMON2 module. Debug facility captures events, errors and the level of severity of the traces and logs them in a file.

---

**Syntax**

```
debug rmon2 {[func-entry][func-exit][critical][mem-  
fail][debug] | [ALL]}
```

```
no debug rmon2
```

---

**Parameter Description**

- **func-entry** - Generates Function Entry Trace messages. When a function is called in the RMON2 module, the details of the function are displayed in the trace message. The traces are captured for all the functions in RMON2.
- **func-exit** - Generates Function Exit Trace messages. When the system completes a function and exits, the details of the function exited is displayed in the trace messages. The traces are captured for all functions.
- **critical** - Generates Critical Trace messages. The errors that cause damage or malfunctioning of the system are displayed as critical traces.
- **mem-fail** - Generates Memory failure Trace messages. When there is a constraint for memory allocation when a function is initiated, the mem-fail trace is displayed.
- **debug** - Generates Debug Trace messages for less severe errors and events.
- **ALL** - Generates all kinds of trace messages mentioned above.

---

**Mode** Privileged EXEC Mode

---

**Example** Your Product# debug rmon2 ALL

---

## Chapter 26

### QoS

---

QoS (Quality of Service) defines the ability to provide different priorities to different applications, users or data flows or the ability to guarantee a certain level of performance to a data flow. **QoS** refers to resource reservation control mechanisms rather than the achieved service quality and specifies a guaranteed throughput level.

**SMIS QoS** provides a complete IP Quality of Service solution and helps in implementing service provisioning policies for application or customers, who desire to have an enhanced performance for their traffic on the Internet.

The list of CLI commands for the configuration of QoS is as follows:

- [shutdown qos](#)
- [qos](#)
- [priority-map](#)
- [class-map](#)
- [meter](#)
- [policy-map](#)
- [queue-type](#)
- [shape-template](#)
- [scheduler](#)
- [queue](#)
- [queue-map](#)
- [sched-hierarchy](#)
- [qos interface](#)




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- [map](#)
- [match access-group](#)
- [set class](#)
- [meter-type](#)
- [set policy](#)
- [set meter](#)
- [set algo-type](#)
- [random-detect dp](#)
- [show qos global info](#)
- [show priority-map](#)
- [show class-map](#)
- [show class-to-priority-map](#)
- [show meter](#)
- [show policy-map](#)
- [show queue-template](#)
- [show shape-template](#)
- [show scheduler](#)
- [show queue](#)
- [show queue-map](#)
- [show sched-hierarchy](#)
- [show qos pbit-preference-over-Dscp](#)
- [show qos def-user-priority](#)
- [show qos meter-stats](#)
- [show qos queue-stats](#)
- [debug qos](#)
- [qos pbit-preference](#)
- [cpu rate limit queue](#)
- [show cpu rate limit](#)


## 26.1 shutdown qos

<b>Command Objective</b>	This command shuts down the QoS subsystem.  The no form of the command starts the QoS subsystem.
<b>Syntax</b>	<code>shutdown qos</code>  <code>no shutdown qos</code>
<b>Mode</b>	Global Configuration Mode
<b>Defaults</b>	QoS subsystem is started and enabled by default.
	<ul style="list-style-type: none"><li>Resources required by QoS subsystem are allocated and QoS subsystem starts running, when started.</li><li>All the MemPools used by the QoS subsystem will be released, when shutdown.</li></ul>
<b>Example</b>	<code>Your Product(config)# shutdown qos</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><code>show qos global info</code> - Displays QoS related global configurations.</li></ul>


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## 26.2 qos

<b>Command Objective</b>	This command enables / disables the QoS subsystem.
<b>Syntax</b>	<code>qos {enable   disable}</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>enable</b> - Enables the QoS subsystem</li><li>• <b>disable</b> - Disables the QoS subsystem</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Defaults</b>	Enabled
	<ul style="list-style-type: none"><li>• QoS module programs the hardware and starts protocol operation, when set as enable.</li><li>• QoS module stops protocol operation by deleting the hardware configuration, when set as disable.</li></ul>
<b>Example</b>	<code>Your Product(config)# qos enable</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show qos global info</code> - Displays QoS related global configurations.</li></ul>

## 26.3 priority-map

<b>Command Objective</b>	<p>This command adds a Priority Map entry. Configures the priority map index for the incoming packet received over ingress Port/VLAN with specified incoming priority. This value ranges between 1 and 65535.</p> <p>The no form of the command deletes a Priority Map entry.</p>
<b>Syntax</b>	<pre>priority-map &lt;priority-map-Id(1-65535)&gt; no priority-map &lt;priority-map-Id(1-65535)&gt;</pre>
<b>Mode</b>	Global Configuration Mode
	QoS subsystem should have been started.
<b>Example</b>	<pre>Your Product(config)# priority-map 1 Your Product(config-pri-map)#</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show priority-map</code> - Displays the Priority Map entry.</li></ul>

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---

## 26.4 class-map

---

**Command Objective** This command adds a Class Map entry. Configures an Index that enumerates the MultiField Classifier table entries. This value ranges between 1 and 65535.

The no form of the command deletes a Class Map entry.

---

**Syntax** `class-map <class-map-id(1-65535)>`  
`no class-map <class-map-id(1-65535)>`

---

**Mode** Global Configuration Mode



QoS subsystem should have been started.

---

**Example** `Your Product(config)# class-map 1`  
`Your Product(config-cls-map)#`

---

**Related Command(s)**

- `show class-map` - Displays the Class Map entry.

---

## 26.5 meter

---

**Command Objective** This command creates a Meter. Configures an Index that enumerates the Meter entries. This value ranges between 1 and 65535.

The no form of the command deletes a Meter.

---

**Syntax** `meter <meter-id(1-65535)>`  
`no meter <meter-id(1-65535)>`

---

**Mode** Global Configuration Mode



QoS subsystem should have been started.

---

**Example** `Your Product(config)# meter 1`  
`Your Product(config-meter)#`

---

**Related Command(s)**

- `show meter` - Displays the Meter entry.

---

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---

## 26.6 policy-map

---

**Command Objective** This command creates a policy map. Configures an Index that enumerates the policy-map table entries. This value ranges between 1 and 65535.

The no form of the command deletes a policy map.

---

**Syntax** `policy-map <policy-map-id(1-65535)>`  
`no policy-map <policy-map-id(1-65535)>`

---

**Mode** Global Configuration Mode



QoS subsystem should have been started.

---

**Example** `Your Product(config)# policy-map 1`  
`Your Product(config-ply-map)#`

---

**Related Command(s)**

- `show policy-map` - Displays the Policy Map entry.

---

## 26.7 queue-type

---

**Command Objective** This command creates a Queue Template Type. This value ranges between 1 and 65535.

The no form of the command deletes a Queue Template Type.

---

**Syntax** `queue-type <Q-Template-Id(1-65535)>`  
`no queue-type <Q-Template-Id(1-65535)>`

---

**Mode** Global Configuration Mode

---

**Example** `Your Product(config)# queue-type 1`  
`Your Product(config-qtype)#`

---

**Related Command(s)**

- `show queue-template` - Displays the Q Template and Random Detect configurations.

---




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---

## 26.8 shape-template


<b>Command Objective</b>	<p>This command creates a Shape Template.</p> <p>The no form of the command deletes a Shape Template.</p>
<b>Syntax</b>	<pre>shape-template &lt;integer(1-65535)&gt; [cir &lt;integer(1-10485760)&gt;] [cbs &lt;integer(0-10485760)&gt;] [eir &lt;integer(0-10485760)&gt;] [ebs &lt;integer(0-10485760)&gt;]</pre> <pre>no shape-template &lt;Shape-Template-Id(1-65535)&gt;</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>shape-template &lt;integer(1-65535)&gt;</b> - Configures the shape Template Table index. This value ranges between 1 and 65535.</li><li>• <b>cir&lt;integer(1-10485760)&gt;</b> - Configures the Committed information rate for packets through the queue. This value ranges between 1 and 10485760. Cir should be less than eir</li><li>• <b>cbs&lt;integer(0-10485760)&gt;</b> - Configures the Committed burst size for packets through the queue. This value ranges between a and 10485760</li><li>• <b>eir&lt;integer(0-10485760)&gt;</b> - Configures the Excess information rate for packets through the hierarchy. This value ranges between a and 10485760</li><li>• <b>ebs&lt;integer(0-10485760)&gt;</b> - Configures the Excess burst size for packets through the hierarchy. This value ranges between a and 10485760</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Example</b>	<pre>Your Product(config)# shape-template 1 cir 20 cbs 40 eir 50 ebs 40</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>show shape-template</b> - Displays the Shape Template configurations.</li></ul>

## 26.9 scheduler

<b>Command Objective</b>	<p>This command creates a Scheduler and configures the Scheduler parameters.</p> <p>The no form of the command deletes a scheduler.</p>
<b>Syntax</b>	<pre> scheduler &lt;integer(1-65535)&gt; interface &lt;iftype&gt; &lt;ifnum&gt; [sched-algo {strict-priority   rr   wrr   wfq   strict-rr   strict-wrr   strict-wfq   deficit-rr}] [shaper &lt;integer(0-65535)&gt;] [hierarchy-level &lt;integer(0-10)&gt;]  no scheduler &lt;Scheduler-Id(1-65535)&gt; interface &lt;iftype&gt; &lt;ifnum&gt;                     </pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>scheduler-Id&lt;integer(1-65535)&gt;</b> - Scheduler identifier that uniquely identifies the scheduler in the system/egress interface. This value ranges between 1 and 65535.</li> <li>• <b>iftype</b> - Interface type. Supports everything except port-channel</li> <li>• <b>ifnum</b> - Interface number.</li> <li>• <b>sched-algo</b> - Packet scheduling algorithm for the port. The algorithms are: <ul style="list-style-type: none"> <li>- <b>strict-priority</b> – strictPriority.</li> <li>- <b>rr</b> – roundRobin.</li> <li>- <b>wrr</b> – weightedRoundRobin.</li> <li>- <b>wfq</b> – weightedFairQueing.</li> <li>- <b>strict-rr</b> – strictRoundRobin.</li> <li>- <b>strict-wrr</b> – strictWeightedRoundRobin.</li> <li>- <b>strict-wfq</b> – strictWeightedFairQueing.</li> <li>- <b>deficit-rr</b> – deficitRoundRobin.</li> </ul> <p> <b>wfq/strict-wfq/deficit-rr</b> are not supported in some modes.</p> </li> <li>• <b>shaper&lt;integer(0-65535)&gt;</b> - Shaper identifier that specifies the bandwidth requirements for the scheduler. This value ranges between 0 and 65535.</li> <li>• <b>hierarchy-level&lt;integer(0-10)&gt;</b> - Depth of the queue/scheduler hierarchy. This value ranges between 0 and 10.</li> </ul>
<b>Mode</b>	Global Configuration Mode
<b>Defaults</b>	<ul style="list-style-type: none"> <li>• sched-algo - strict-priority</li> </ul>

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<b>Example</b>	<ul style="list-style-type: none"><li>• hierarchy-level - 0</li></ul> <pre>Your Product(config)# scheduler 1 interface gigabitethernet 0/1 sched-algo rr shaper 1 hierarchy-level 1</pre>
	Shape -template with the shaper id should have been created to specify the bandwidth requirements for the scheduler
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show scheduler</code> - Displays the configured Scheduler.</li><li>• <code>sched-hierarchy</code> - Creates a Scheduler Hierarchy.</li><li>• <code>show sched-hierarchy</code> - Displays the configured hierarchy scheduler.</li><li>• <code>shape-template</code> - Creates a Shape Template.</li></ul>

## 26.10 queue

<b>Command Objective</b>	<p>This command creates a Queue and configures the Queue parameters.</p> <p>The no form of the command deletes a Queue.</p>
<b>Syntax</b>	<pre>queue &lt;integer(1-65535)&gt; interface &lt;iftype&gt; &lt;ifnum&gt; [qtype &lt;integer(1-65535)&gt;] [scheduler &lt;integer(1-65535)&gt;] [weight &lt;integer(0-1000)&gt;] [priority &lt;integer(0-15)&gt;] [shaper &lt;integer(0-65535)&gt;] [queue-type {unicast   multicast }]  no queue &lt;integer(1-65535)&gt; interface &lt;iftype&gt; &lt;ifnum&gt;</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>queue&lt;integer(1-65535)&gt;</b> - Queue identifier that uniquely identifies the queue in the system/port. This value ranges between 1 and 65535.</li> <li>• <b>iftype</b> - Interface type. Supports everything except port-channel</li> <li>• <b>ifnum</b> - Interface number.</li> <li>• <b>qtype&lt;integer(1-65535)&gt;</b> - Queue Type identifier. This value ranges between 1 and 65535.</li> <li>• <b>scheduler&lt;integer(1-65535)&gt;</b> - Scheduler identifier that manages the specified queue. This value ranges between 1 and 65535.</li> <li>• <b>weight&lt;integer(0-1000)&gt;</b> - User assigned weight to the CoS queue. This value ranges between 0 and 1000.</li> <li>• <b>priority&lt;integer(0-15)&gt;</b> - User assigned priority for the CoS queue. This value ranges between 0 and 15.</li> <li>• <b>shaper&lt;integer(0-65535)&gt;</b> - Shaper identifier that specifies the bandwidth requirements for the queue. This value ranges between 0 and 65535.</li> <li>• <b>unicast</b> - Unicast queue to store known unicast packets</li> <li>• <b>multicast</b> - Multicast queue to store DLF, multicast, broadcast and mirrored packets</li> </ul>
<b>Mode</b>	Global Configuration Mode
<b>Defaults</b>	<ul style="list-style-type: none"> <li>• weight - 0</li> <li>• priority - 0</li> <li>• Queue-type - Unicast</li> </ul>

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## Example

```
Your Product(config)# queue 1 interface giga 0/1 qtype 2  
scheduler 1 weight 20 priority 10 shaper 1.
```

---




- Scheduler identifier is unique relative to an egress interface.
  - User assigned weights are used only when scheduling algorithm is a weighted scheduling algorithm.
  - User assigned priority is used only when the scheduler uses a priority based scheduling algorithm.
- 


## Related Command(s)

- **queue-type** – Creates a Queue Template Type.
  - **scheduler** – Creates a Scheduler and configures the Scheduler parameters.
  - **shape-template** – Creates a Shape Template.
  - **show queue** – Displays the configured Queues.
-

## 26.11 queue-map

<b>Command Objective</b>	<p>This command creates a Map for a Queue with Class or regenerated priority.</p> <p>The no form of the command deletes a Queue map entry.</p>
<b>Syntax</b>	<pre>queue-map { CLASS &lt;integer(1-65535)&gt;   regn-priority { vlanPri   ipTos   ipDscp   mplsExp   vlanDEI } &lt;integer(0-63)&gt; } [interface &lt;iftype&gt; &lt;ifnum&gt;] queue-id &lt;integer(1-65535)&gt;  no queue-map { CLASS &lt;integer(1-65535)&gt;   regn-priority { vlanPri   ipTos   ipDscp   mplsExp   vlanDEI } &lt;integer(0-63)&gt; } [interface &lt;iftype&gt; &lt;ifnum&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>CLASS &lt;integer(1-65535)&gt;</b> - Input CLASS that needs to be mapped to an outbound queue. This value ranges between 1 and 65535.</li> <li>• <b>regn-priority&lt;integer(0-63)&gt;</b> - Regenerated-priority type and regenerated-priority that needs to be mapped to an outbound queue. The types are <ul style="list-style-type: none"> <li>– <b>vlanPri</b> – VLAN Priority.</li> <li>– <b>ipTos</b> – IP Type of Service.</li> <li>– <b>ipDscp</b> – IP Differentiated Services Code Point.</li> <li>– <b>mplsExp</b> – MPLS Experimental</li> <li>– <b>vlanDEI</b> – VLAN Drop Eligibility Indicator.</li> </ul> </li> <li>• <b>iftype</b> - Interface type. Supports everything except port-channel</li> <li>• <b>ifnum</b> - Interface number.</li> <li>• <b>queue-id &lt;integer(1-65535)&gt;</b> - Queue identifier that uniquely identifies a queue relative to an interface. This value ranges between 1 and 65535.</li> </ul>
<b>Mode</b>	Global Configuration Mode
<b>Example</b>	<pre>Your Product(config)# queue-map CLASS 1 interface giga 0/1 queue-id 1</pre>
	<ul style="list-style-type: none"> <li>• CLASS should be zero while configuring RegenPriority specific Q.</li> <li>• Regenerated-priority should be zero while configuring CLASS specific Queue.</li> </ul>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li>• <b>show queue-map</b> – Displays the configured Queue map.</li> </ul>

## 26.12 sched-hierarchy

<b>Command Objective</b>	This command creates a Scheduler Hierarchy.
	The no form of the command deletes a Scheduler Hierarchy.
<b>Syntax</b>	<pre> <b>sched-hierarchy</b> interface &lt;iftype&gt; &lt;ifnum&gt; hierarchy-level &lt;integer(1-10)&gt; sched-id &lt;integer(1-65535)&gt; {next-level- queue &lt;integer(0-65535)&gt;   next-level-scheduler &lt;integer(0-65535)&gt;} [priority &lt;integer(0-15)&gt;] [weight &lt;integer(0-1000)&gt;]  no sched-hierarchy interface &lt;iftype&gt; &lt;ifnum&gt; hierarchy- level &lt;integer(1-10)&gt; sched-id &lt;integer(1-65535)&gt; </pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>iftype</b> - Interface type. Supports everything except port-channel</li> <li>• <b>ifnum</b> - Interface number.</li> <li>• <b>hierarchy-level &lt;integer(1-10)&gt;</b> - Depth of the queue/scheduler hierarchy.</li> <li>• <b>sched-id &lt;integer(1-65535)&gt;</b> - Scheduler identifier. <ul style="list-style-type: none"> <li>- <b>next-level-queue</b> – Next-level queue to which the scheduler output needs to be sent.</li> <li>- <b>next-level-scheduler</b> – Next-level scheduler to which the scheduler output needs to be sent.</li> </ul> </li> <li>• <b>priority &lt;integer(0-15)&gt;</b> - Scheduler priority.</li> <li>• <b>weight &lt;integer(0-1000)&gt;</b> - Scheduler weight.</li> </ul>
<b>Mode</b>	Global Configuration Mode
<b>Defaults</b>	priority - 0
<b>Example</b>	<pre> Your Product(config)# sched-hierarchy interface giga 0/1 hierarchy-level 3 sched-id 1 next-level-queue 2 priority 5 weight 50 </pre>
	<ul style="list-style-type: none"> <li>• The priority is specified when the scheduler is connecting to any of the priorities ( EF, AF, BE) of the next level strict-priority scheduler.</li> <li>• The weight is specified if the scheduler is connecting to a WeightedFairQueuing of another scheduler.</li> </ul>

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## Related Command(s)

- `show scheduler` - Displays the configured Scheduler.
  - `sched-hierarchy` - Creates a Scheduler Hierarchy.
  - `show sched-hierarchy` - Displays the configured hierarchy scheduler.
-



## 26.13 qos interface

<b>Command Objective</b>	This command sets the default ingress user priority for the port.
<b>Syntax</b>	<code>qos interface &lt;iftype&gt; &lt;ifnum&gt; def-user-priority &lt;integer(0-7)&gt;</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>iftype</code> - Interface type</li><li>• <code>ifnum</code> - Interface number</li><li>• <code>def-user-priority &lt;integer(0-7)&gt;</code> - Default ingress user priority for the port</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Example</b>	<pre>Your Product(config)# qos interface gigabitethernet 0/1 def-user-priority 3</pre>
	The default ingress user priority will be used to set priority for untagged packets.
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show qos def-user-priority</code> – Displays the configured default ingress user priority for a port.</li></ul>

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## 26.14 map

<b>Command Objective</b>	<p>This command adds a Priority Map Entry for mapping an incoming priority to a regenerated priority.</p> <p>The no form of the command sets default value to the Interface, VLAN, and regenerated inner priority.</p>
<b>Syntax</b>	<pre>map [interface &lt;iftype&gt; &lt;ifnum&gt;] [vlan &lt;integer(1-4094)&gt;] in-priority-type { vlanPri   ipTos   ipDscp   mplsExp   vlanDEI } in-priority &lt;integer(0-63)&gt; regen-priority &lt;integer(0-63)&gt; [regen-inner-priority &lt;integer(0-7)&gt;]  no map { interface   vlan   regen-inner-priority }</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>iftype</b> - Interface type</li><li>• <b>ifnum</b> - Interface number</li><li>• <b>vlan &lt;integer(1-4094)&gt;</b> - VLAN identifier. This value ranges between 1 and 4094.</li><li>• <b>in-priority-type</b> - Type of the incoming priority. The types are:<ul style="list-style-type: none"><li>– <b>vlanPri</b> – VLAN Priority.</li><li>– <b>ipTos</b> – IP Type of Service.</li><li>– <b>ipDscp</b> – IP Differentiated Services Code Point.</li><li>– <b>mplsExp</b> – MPLS Experimental</li><li>– <b>vlanDEI</b> – VLAN Drop Eligibility Indicator.</li></ul></li><li>• <b>in-priority &lt;integer(0-63)&gt;</b> - Incoming priority value determined for the received frame. This value ranges between 0 and 63.</li><li>• <b>regen-priority &lt;integer(0-63)&gt;</b> - Regenerated priority value determined for the received frame. This value ranges between 0 and 63.</li><li>• <b>regen-inner-priority &lt;integer(0-7)&gt;</b> - Regenerated inner-VLAN (CVLAN) priority value determined for the received frame. This value ranges between 0 and 7.</li></ul>
<b>Mode</b>	Priority Map Configuration Mode
<b>Defaults</b>	<ul style="list-style-type: none"><li>• vlan - 0</li><li>• in-priority-type - vlanPri</li></ul>

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- in-priority - -1
- regen-priority - 0

---

**Example**

```
Your Product(config-pri-map)# map interface gig 0/1 vlan  
4094 in-priority-type vlanPri in-priority 0 regen-priority  
7 regen-inner-priority 1
```



Priority Map entry should have been created.

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**Related Command(s)**

- `priority-map` – Adds a Priority Map entry
  - `show priority-map` – Displays the Priority Map entry.
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## 26.15 match access-group

<b>Command Objective</b>	This command sets Class Map parameters using L2and/or L3 ACL or Priority Map ID.
<b>Syntax</b>	<pre>match access-group { [mac-access-list &lt;integer(0-65535)&gt;] [ ip-access-list &lt;integer(0-65535)&gt;]   priority-map &lt;integer(0-65535)&gt; }</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>mac-access-list &lt;integer(0-65535)&gt;</b> - Identifier of the MAC filter. This value ranges between 0 and 65535.</li><li>• <b>ip-access-list &lt;integer(0-65535)&gt;</b> - Identifier of the IP filter. This value ranges between 0 and 65535.</li><li>• <b>priority-map &lt;integer(0-65535)&gt;</b> - Priority Map identifier for mapping incoming priority against received packet. This value ranges between 0 and 65535.</li></ul>
<b>Mode</b>	Class Map Configuration Mode
<b>Defaults</b>	<ul style="list-style-type: none"><li>• mac-access-list - 0</li><li>• ip-access-list - 0</li><li>• priority-map - 0</li></ul>
<b>Example</b>	<pre>Your Product(config-cls-map)# match access-group priority-map 1</pre>
	<ul style="list-style-type: none"><li>• Priority map ID should have been created.</li><li>• L2 and/or L3 ACL should have been created.</li></ul>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>priority-map</b> – Adds a Priority Map entry.</li><li>• <b>show class-map</b> – Displays the Class Map entry.</li></ul>

## 26.16 set class

<b>Command Objective</b>	<p>This command sets CLASS for L2and/or L3 filters or Priority Map ID and adds a CLASS to Priority Map entry with regenerated priority.</p> <p>The no form of the command deletes a CLASS to Priority Map Table entry.</p>
<b>Syntax</b>	<pre>set class &lt;class integer(1-65535)&gt; [pre-color { green   yellow   red   none }] [ regen-priority &lt;integer(0-7)&gt; group-name &lt;string(31)&gt; ]  no set class &lt;class integer(1-65535)&gt;</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>&lt;class integer(1-65535)&gt;</b> - Traffic CLASS to which an incoming frame pattern is classified.</li> <li>• <b>pre-color</b> - Color of the packet prior to metering. This can be any one of the following: <ul style="list-style-type: none"> <li>- <b>None</b> – Traffic is not pre-colored.</li> <li>- <b>green</b> – Traffic conforms to SLAs (Service Level Agreements.</li> <li>- <b>yellow</b> – Traffic exceeds the SLAs.</li> <li>- <b>red</b> – Traffic violates the SLAs.</li> </ul> </li> <li>• <b>regen-priority &lt;integer(0-7)&gt;</b> - Regenerated priority value determined for the input CLASS. This value ranges between 0 and 7.</li> <li>• <b>group-name &lt;string(31)&gt;</b> - Unique identification of the group to which an input CLASS belongs.</li> </ul>
<b>Mode</b>	Class Map Configuration Mode
<b>Defaults</b>	<ul style="list-style-type: none"> <li>• class - 0</li> </ul>
<b>Example</b>	<pre>Your Product(config-cls-map)# set class 1000 pre-color none regen-priority 1 group-name CLASS</pre>
	<ul style="list-style-type: none"> <li>• Class map should have created.</li> <li>• The default value zero provided for the class is not configurable.</li> </ul>
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li>• <b>show class-to-priority-map</b> – Displays the class group Entry.</li> </ul>


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## 69.17 meter-type


<b>Command Objective</b>	This command sets Meter parameters CIR, CBS, EIR, EBS, Interval, meter type and color awareness.
<b>Syntax</b>	<pre>meter-type { simpleTokenBucket   avgRate  srTCM   trTCM   tswTCM   mefCoupled   mefDeCoupled } [ color-mode { aware   blind } ] [interval &lt;short(1-10000)&gt;] [cir &lt;integer(0-65535)&gt;] [cbs &lt;integer(0-65535)&gt;] [eir &lt;integer(0-65535)&gt;] [ebs &lt;integer(0-65535)&gt;] [next-meter &lt;integer(0-65535)&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>simpleTokenBucket</b> - Two Parameter Token Bucket Meter.</li><li>• <b>avgRate</b> - Average Rate Meter. Valid parameters supported are interval and cir. It is not supported in some models.</li><li>• <b>srTCM</b> - Single Rate Three Color Marker Metering as defined by RFC 2697. Valid parameters supported are cir, cbs and ebs</li><li>• <b>trTCM</b> - Two Rate Three Color Marker Metering as defined by RFC 2698. Valid value for Given Meter Type are CIR, CBS EIR, and EBS</li><li>• <b>tswTCM</b> - Time Sliding Window Three Color Marker Metering as defined by RFC 2859.</li><li>• <b>mefCoupled</b> - Dual bucket meter as defined by RFC 4115. It is not supported in some models.</li><li>• <b>mefDeCoupled</b> - Dual bucket meter as defined by RFC 2697 and MEF coupling Flag. It is not supported in some models.</li><li>• <b>color-mode</b> - Indicates the color mode of the Meter. The color modes are:<ul style="list-style-type: none"><li>– <b>aware</b> – The Meter considers the pre-color of the packet.</li><li>– <b>blind</b> – The Meter ignores the pre-color of the packet.</li></ul></li><li>• <b>interval &lt;short(1-10000)&gt;</b> - Time interval used with the token bucket. This value ranges between 1 and 10000.</li><li>• <b>cir &lt;integer(0-65535)&gt;</b> - Committed information rate. This value ranges between 0 and 65535.</li><li>• <b>cbs &lt;integer(0-65535)&gt;</b> - Committed burst size. This value ranges between 0 and 65535.</li><li>• <b>eir &lt;integer(0-65535)&gt;</b> - Excess information rate. This value ranges between 0 and 65535.</li><li>• <b>ebs &lt;integer(0-65535)&gt;</b> - Excess burst size. This value ranges between 0 and 65535.</li></ul>

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	<ul style="list-style-type: none"><li>• <b>next-meter</b> &lt;integer(0-65535)&gt; - Meter entry identifier used for applying the second/next level of conformance on the incoming packet. This value ranges between 0 and 65535.</li></ul>
<b>Mode</b>	Meter Configuration Mode
<b>Defaults</b>	<ul style="list-style-type: none"><li>• color-mode - blind</li><li>• interval - none</li><li>• next-meter - next-meter</li><li>• type - Simple token bucket</li></ul>
<b>Example</b>	Your Product(config-meter)# meter-type simpleTokenBucket color-mode aware interval 10 cir 1000
	Meter should have been created.
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>meter</b> - Creates a Meter.</li><li>• <b>show meter</b> - Displays the Meter entry.</li></ul>

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## 26.18 set policy

<b>Command Objective</b>	<p>This command sets CLASS for policy.</p> <p>The no form of the command sets the default value for interface in this policy.</p>
<b>Syntax</b>	<pre>set policy [class &lt;integer(0-65535)&gt;] [interface &lt;iftype&gt; &lt;ifnum&gt;] default-priority-type { none   { vlanPri   ipTos   ipDscp   mplsExp } &lt;integer(0-63)&gt; }  no set policy interface</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>class &lt;integer(0-65535)&gt;</b> - Traffic CLASS for which the policy-map needs to be applied.</li><li>• <b>iftype</b> - Interface type</li><li>• <b>ifnum</b> - Interface number</li><li>• <b>default-priority-type&lt;integer(0-63)&gt;</b> - Per-Hop Behavior (PHB) type to be used for filling the default PHB for the policy-map entry. The types are:<ul style="list-style-type: none"><li>- <b>none</b> – No specific PHB type is set.</li><li>- <b>vlanPri</b> – VLAN priority.</li><li>- <b>ipTos</b> – IP Type of Service.</li><li>- <b>ipDscp</b> – IP Differentiated Services Code Point.</li><li>- <b>mplsExp</b> – MPLS Experimental</li></ul></li></ul>
<b>Mode</b>	Policy Map Configuration Mode
<b>Defaults</b>	class - 0
<b>Example</b>	<pre>Your Product(config-ply-map)# set policy class 1 interface gigabitethernet 0/1 default-priority-type none</pre>
	CLASS should have been created.
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>class-map</b> – Adds a Class Map Entry.</li><li>• <b>policy-map</b> – Creates a policy map.</li><li>• <b>show policy-map</b> – Displays the Policy Map Entry.</li></ul>



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## 26.19 set meter

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**Command Objective** This command sets Policy parameters such as Meter and Meter Actions.

The no form of the command removes the Meter from the Policy and the Meter Actions.

---

**Syntax**

```
set meter <integer(1-65535)> [ conform-action { drop | set-cos-transmit <short(0-7)> set-de-transmit <short(0-1)> | set-port <iftype> <ifnum> | set-inner-vlan-pri <short(0-7)> | set-mpls-exp-transmit <short(0-7)> | set-ip-prec-transmit <short(0-7)> | set-ip-dscp-transmit <short(0-63)> } ] [ exceed-action { drop | set-cos-transmit <short(0-7)> set-de-transmit <short(0-1)> | set-inner-vlan-pri <short(0-7)> | set-mpls-exp-transmit <short(0-7)> | set-ip-prec-transmit <short(0-7)> | set-ip-dscp-transmit <short(0-63)> } ] [ violate-action { drop | set-cos-transmit <short(0-7)> set-de-transmit <short(0-1)> | set-inner-vlan-pri <short(0-7)> | set-mpls-exp-transmit <short(0-7)> | set-ip-prec-transmit <short(0-7)> | set-ip-dscp-transmit <short(0-63)> } ] [ set-conform-newclass <integer(0-65535)> ] [ set-exceed-newclass <integer(0-65535)> ] [ set-violate-newclass <integer(0-65535)> ]
```

```
no set meter
```

---


**Parameter Description**

- **<integer(1-65535)>** - Meter table identifier which is the index for the Meter table.
- **conform-action** - Action to be performed on the packet, when the packets are found to be In profile (conform). Options are:
  - **drop** – No action is configured.
  - **set-cos-transmit<short(0-7)>** – Sets the VLAN priority of the outgoing packet. This value ranges 0 and 7.
  - **set-de-transmit<short(0-1)>** – Sets the VLAN Drop Eligible indicator of the outgoing packet. This value ranges between 0 and 1.
  - **set-port<iftype> <ifnum>** – Sets the new port value.
  - **set-inner-vlan-pri<short(0-7)>** – Sets the inner VLAN priority of the outgoing packet. This value ranges between 0 and 7.
  - **set-mpls-exp-transmit<short(0-7)>** – Sets the MPLS Experimental bits of the outgoing packet. This value ranges between 0 and 7. It is not supported.
  - **set-ip-prec-transmit<short(0-7)>** – Sets the new IP TOS value. This value ranges between 0 and 7.
  - **set-ip-dscp-transmit<short(0-63)>** – Sets the new DSCP value. This value ranges between 0 and 63.


- **exceed-action** - Action to be performed on the packet, when the packets are found to be In profile (exceed). Options are:
    - **drop** – Drops the packet.
    - **set-cos-transmit<short(0-7)>** – Sets the VLAN priority of the outgoing packet. This value ranges 0 and 7.
    - **set-de-transmit<short(0-1)>** – Sets the VLAN Drop Eligible indicator of the outgoing packet. This value ranges between 0 and 1.
    - **set-port<iftype> <ifnum>** – Sets the new port value.
    - **set-inner-vlan-pri<short(0-7)>** – Sets the inner VLAN priority of the outgoing packet. This value ranges between 0 and 7.
    - **set-mpls-exp-transmit<short(0-7)>** – Sets the MPLS Experimental bits of the outgoing packet. This value ranges between 0 and 7. It is not supported.
    - **set-ip-prec-transmit<short(0-7)>** – Sets the new IP TOS value. This value ranges between 0 and 7.
    - **set-ip-dscp-transmit<short(0-63)>** – Sets the new DSCP value. This value ranges between 0 and 63.
  - **violate-action** - Action to be performed on the packet, when the packets are found to be out of profile. Options are:
    - **drop** – Drops the packet.
    - **set-cos-transmit<short(0-7)>** – Sets the VLAN priority of the outgoing packet. This value ranges 0 and 7.
    - **set-de-transmit<short(0-1)>** – Sets the VLAN Drop Eligible indicator of the outgoing packet. This value ranges between 0 and 1.
    - **set-port<iftype> <ifnum>** – Sets the new port value.
    - **set-inner-vlan-pri<short(0-7)>** – Sets the inner VLAN priority of the outgoing packet. This value ranges between 0 and 7.
    - **set-mpls-exp-transmit<short(0-7)>** – Sets the MPLS Experimental bits of the outgoing packet. This value ranges between 0 and 7. It is not supported.
    - **set-ip-prec-transmit<short(0-7)>** – Sets the new IP TOS value. This value ranges between 0 and 7.
    - **set-ip-dscp-transmit<short(0-63)>** – Sets the new DSCP value. This value ranges between 0 and 63.
  - **set-conform-newclass<integer(0-65535)>** - Represents the Traffic CLASS to which an incoming frame pattern is classified after metering. This value ranges between 0 and 65535.
  - **set-exceed-newclass<integer(0-65535)>** - Represents the Traffic CLASS to which an incoming frame pattern is classified after metering. This value ranges between 0 and 65535.
  - **set-violate-newclass<integer(0-65535)>** - Represents the Traffic CLASS to which an incoming frame pattern is classified after metering. This value ranges between 0 and 65535.
-

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<b>Mode</b>	Policy Map Configuration Mode
<b>Defaults</b>	<ul style="list-style-type: none"><li>• <code>set-cos-transmit - 0</code></li><li>• <code>set-de-transmit - 0</code></li><li>• <code>set-mpls-exp-transmit - 0</code></li><li>• <code>set-inner-vlan-pri - 0</code></li></ul>
<b>Example</b>	<pre>Your Product(config-ply-map)# set meter 1 conform-action drop exceed-action drop violate-action drop set-conform- newclass 1 set-exceed-newclass 1 set-violate-newclass 1</pre>
	VLAN priority can be set to a non-zero value only when MPLS Experimental bits is set to zero.
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>Show policy-map</code> - Displays the Policy Map entry</li></ul>

## 26.20 set algo-type

<b>Command Objective</b>	This command sets Q Template entry parameters.
<b>Syntax</b>	<code>set algo-type { tailDrop   headDrop   red   wred } [queue-limit &lt;integer(1-65535)&gt;] [queue-drop-algo {enable   disable }]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>algo-type</b> - Type of drop algorithm used by the queue template. Options are: <ul style="list-style-type: none"> <li>– <b>tailDrop</b> – Beyond the maximum depth of the queue, all newly arriving packets will be dropped. It is not supported in some models.</li> <li>– <b>headDrop</b> – Packets currently at the head of the queue are dropped to make room for the new packet to be enqueued at the tail of the queue, when the current depth of the queue is at the maximum depth of the queue. It is not supported in some models.</li> <li>– <b>red</b> – On packet arrival, an Active Queue Management algorithm is executed which may randomly drop a packet. It is not supported in some models.</li> <li>– <b>wred</b> – On packet arrival, an Active Queue Management algorithm is executed which may randomly drop a packet.</li> </ul> </li> <li>• <b>queue-limit&lt;integer(1-65535)&gt;</b> - Queue size. This value ranges between 1 and 65535.</li> <li>• <b>queue-drop-algo</b> - Enable/disable Drop Algorithm for Congestion Management. Options are: <ul style="list-style-type: none"> <li>– <b>enable</b> – Enables Drop Algorithm.</li> <li>– <b>disable</b> – Disables Drop Algorithm.</li> </ul> </li> </ul>
<b>Mode</b>	Queue Template Configuration mode
<b>Defaults</b>	<ul style="list-style-type: none"> <li>• queue-drop-algo - disable</li> <li>• Drop-type - Taildrop</li> <li>• Queue-limit - 10000</li> </ul>
<b>Example</b>	<code>Your Product(config-qtype)# set algo-type red queue-limit 18 queue-drop-algo enable</code>
	<ul style="list-style-type: none"> <li>• Queue size must be greater than or equal to the minimum average threshold and less than or equal to the maximum average threshold.</li> <li>• Drop algorithm for Congestion Management can be enabled only when the Random Detect Table entry is created for the Queue.</li> </ul>

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## Related Command(s)

- `random-detect dp` – Sets Random Detect Table entry parameters.
  - `show queue-template` – Displays the Q Template and Random Detect configurations.
-

## 26.21 random-detect dp

<b>Command Objective</b>	This command sets Random Detect Table entry parameters.
	The no form of the command deletes Random Detect Table entry.
<b>Syntax</b>	<pre>random-detect dp &lt;short(0-2)&gt; [min-threshold &lt;short(1-65535)&gt;] [max-threshold &lt;short(1-65535)&gt;] [max-pkt-size &lt;short(1-65535)&gt;] [mark-probability-denominator &lt;short(1-100)&gt;] [exponential-weight &lt;integer(0-31)&gt;]  no random-detect dp &lt;short(0-2)&gt;</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li>• <b>dp&lt;short(0-2)&gt;</b> - Drop Precedence. Options are: <ul style="list-style-type: none"> <li>- 0 – low drop precedence.</li> <li>- 1 – medium drop precedence.</li> <li>- 2 – high drop precedence.</li> </ul> </li> <li>• <b>min-threshold&lt;short(1-65535)&gt;</b> - Minimum average threshold for the random detect algorithm. This value ranges between 1 and 65535.</li> <li>• <b>max-threshold&lt;short(1-65535)&gt;</b> - Maximum average threshold for the random detect algorithm. This value ranges between 1 and 65535.</li> <li>• <b>max-pkt-size&lt;short(1-65535)&gt;</b> - Maximum allowed packet size. This value ranges between 1 and 65535.</li> <li>• <b>mark-probability-denominator&lt;short(1-100)&gt;</b> - Maximum probability of discarding a packet in units of percentage. This value ranges between 1 and 100.</li> <li>• <b>exponential-weight&lt;integer(0-31)&gt;</b> - Exponential weight for determining the average queue size. This value ranges between 0 and 31.</li> </ul>
<b>Mode</b>	Queue Template Configuration Mode
<b>Defaults</b>	<ul style="list-style-type: none"> <li>• mark-probability-denominator - 100</li> <li>• exponential-weight - 0</li> </ul>
<b>Example</b>	<pre>Your Product(config-qtype)# random-detect dp 1 min-threshold 1200 max-threshold 13000 max-pkt-size 100 mark-probability-denominator 50 exponential-weight 30</pre>


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## 26.22 show qos global info

<b>Command Objective</b>	This command displays QoS related global configurations.
<b>Syntax</b>	<code>show qos global info</code>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# show qos global info QoS Global Information ----- System Control           : Start System Control           : Enable Rate Unit                 : kbps Rate Granularity         : 64 Trace Flag                : 0</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>shutdown qos</code> – Shutdown the QoS subsystem.</li><li>• <code>qos</code> – Enables or disables the QoS subsystem.</li></ul>

## 26.23 show priority-map


<b>Command Objective</b>	This command displays the Priority Map entry.
<b>Syntax</b>	<code>show priority-map [&lt;priority-map-id(1-65535)&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li><code>&lt;priority-map-id(1-65535)&gt;</code> - Output priority map index for the incoming packet received over ingress Port/VLAN with specified incoming priority.</li> </ul>
<b>Mode</b>	Privileged EXEC Mode.
<b>Example</b>	<pre>Your Product# show priority-map QoS Priority Map Entries ===== PriorityMapId           : 1 IfIndex                 : 1 VlanId                  : 4094 InPriorityType           : VlanPriority InPriority               : 0 RegenPriority            : 7 InnerRegenPriority       : 1 PriorityMapId           : 9 IfIndex                 : gi 0/5 VlanId                  : 2 InPriorityType           : IP Protocol InPriority               : 1 RegenPriority            : 5 InnerRegenPriority       : 7</pre>
	If executed without the optional parameters, this command displays all the available Priority Map information.
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><code>priority-map</code> – Adds a Priority Map entry</li> <li><code>map</code> - Adds a Priority Map entry for mapping an incoming priority to a regenerated priority</li> </ul>



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## 26.24 show class-map

<b>Command Objective</b>	This command displays the Class Map entry.
<b>Syntax</b>	<code>show class-map [&lt;class-map-id(1-65535)&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li><code>&lt;class-map-id(1-65535)&gt;</code> - Index that enumerates the MultiField Classifier table entries.</li></ul>
<b>Mode</b>	Privileged EXEC Mode.
<b>Example</b>	<pre>Your Product# show class-map QoS Class Map Entries ===== ClassMapId           : 1 L2FilterId           : None L3FilterId           : None PriorityMapId        : 1 CLASS                : 1000 PolicyMapId          : 1 PreColor             : None Status               : Active</pre>
	If executed without the optional parameters, this command displays all the available Class Map information
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><code>class-map</code> – Adds a Class Map entry.</li><li><code>priority-map</code> – Adds a Priority Map entry</li></ul>


## 26.25 show class-to-priority-map

<b>Command Objective</b>	This command displays the class group entry.
<b>Syntax</b>	<code>show class-to-priority-map &lt;group-name(31)&gt;</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li><code>&lt;group-name(31)&gt;</code> - Unique identification of the group to which an input CLASS belongs.</li></ul>
<b>Mode</b>	Privileged EXEC Mode.
<b>Example</b>	<pre>Your Product# show class-to-priority-map CLASS1 QoS Class To Priority Map Entries ----- GroupName      : CLASS1 Class           LocalPriority -----                 2                2</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><code>show class-map</code> - Displays the Class Map entry.</li><li><code>set class</code> - Sets CLASS for L2and/or L3 filters or Priority Map ID and adds a CLASS to Priority Map Entry with regenerated priority.</li></ul>


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## 26.26 show meter

<b>Command Objective</b>	This command displays the Meter entry.
<b>Syntax</b>	<code>show meter [&lt;meter-id(1-65535)&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li><code>&lt;meter-id(1-65535)&gt;</code> - Index that enumerates the Meter entries. This value ranges between 1 and 65535.</li></ul>
<b>Mode</b>	Privileged EXEC Mode.
<b>Example</b>	<pre>Your Product# show meter QoS Meter Entries ===== MeterId                : 1 Type                   : Simple Token Bucket Color Mode              : Color Aware Interval                : 10 CIR                     : 1000 CBS                     : None EIR                     : None EBS                     : None NextMeter               : None Status                  : Active</pre>
	If executed without the optional parameters, this command displays all the available Meter information.
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><code>set meter</code> – Sets Policy parameters such as Meter and Meter Actions.</li></ul>


## 26.27 show policy-map

<b>Command Objective</b>	This command displays the Policy Map entry.
<b>Syntax</b>	<code>show policy-map [&lt;meter-id(1-65535)&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li><code>&lt;meter-id(1-65535)&gt;</code> - Index that enumerates the Meter entries.</li></ul>
<b>Mode</b>	Privileged EXEC Mode.
<b>Example</b>	<pre>Your Product# show policy-map QoS Policy Map Entries ===== PolicyMapId   : 1 IfIndex       : 0 Class         : 0 DefaultPHB    : None. MeterId       : 1 ConNClass     : 0 ExcNClass     : 0 VioNClass     : 0 ConfAct       : Port 1 ExcAct        : Drop. VioAct        : Drop.</pre>
	If executed without the optional parameter, this command displays all the available Policy Map. information
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><code>set policy</code> - Sets CLASS for policy.</li></ul>


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## 26.28 show queue-template

<b>Command Objective</b>	This command displays the Q Template and Random Detect configurations.
<b>Syntax</b>	<code>show queue-template [&lt;queue-template-Id(1-65535)&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li><code>&lt;queue-template-Id(1-65535)&gt;</code>-Id - Queue Template Table index.</li></ul>
<b>Mode</b>	Privileged EXEC Mode.
<b>Example</b>	<pre>Your Product# show queue-template Queue Template Entries ----- Q Template Id           : 1 Q Limit                 : 10000 Drop Type               : Tail Drop Drop Algo Status       : Disable</pre>
	If executed without the optional parameter, this command displays all the available Queue Template information.
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li><code>queue-type</code> - Creates a Queue Template Type.</li></ul>


## 26.29 show shape-template

<b>Command Objective</b>	This command displays the Shape Template configurations.
<b>Syntax</b>	<code>show shape-template [&lt;shape-template-Id(1-65535)&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li><code>&lt;shape-template-Id(1-65535)&gt;</code> - Shape Template Table index.</li> </ul>
<b>Mode</b>	Privileged EXEC Mode.
<b>Example</b>	<pre> Your Product# show shape-template QoS Shape Template Entries ----- ShapeTemplate Id          CIR    CBS    EIR    EBS ----- 1                          1      1      1      1                     </pre>
	If executed without the optional parameter, this command displays all the available Shape Template information
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><code>shape-template</code> – Creates a Shape Template.</li> </ul>


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## 26.30 show scheduler

<b>Command Objective</b>	This command displays the configured Scheduler.
<b>Syntax</b>	<code>show scheduler [interface &lt;iftyp&gt; &lt;ifnum&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>iftyp</code> - Interface type.</li><li>• <code>ifnum</code> - Interface number.</li></ul>
<b>Mode</b>	Privileged EXEC Mode.
<b>Example</b>	<pre>Your Product# show scheduler QoS Scheduler Entries ----- IfIndex Scheduler Index Scheduler Algo Shape Index Scheduler HL GlobalId ----- ----- Gi0/1 1 strictPriority 0 0 1</pre>
	If executed without the optional parameter, this command displays all the available scheduler entries.
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>scheduler</code> - Creates a Scheduler and configures the Scheduler parameters.</li></ul>


## 26.31 show queue

<b>Command Objective</b>	This command displays the configured Queues.
<b>Syntax</b>	<code>show queue [interface &lt;iftype&gt; &lt;ifnum&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li><code>iftype</code> - Interface type.</li> <li><code>ifnum</code> - Interface number.</li> </ul>
<b>Mode</b>	Privileged EXEC Mode.
<b>Example</b>	<pre> Your Product# show queue QoS Queue Entries ----- IfIndex Queue Idx Queue Type Scheduler Idx Weight Priority Shape Idx Global Id ----- ----- Gi0/1      1          1          1          1          1 1          1           </pre>
	If executed without the optional parameter, this command displays all the available queue entries
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><code>queue</code> - Creates a Queue and configures the Queue parameters.</li> <li><code>queue-type</code> - Creates a Queue Template Type.</li> <li><code>show queue-template</code> - Displays the Q Template and Random Detect configurations.</li> </ul>




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## 26.32 show queue-map

<b>Command Objective</b>	This command displays the configured Queue map.
<b>Syntax</b>	<code>show queue-map [interface &lt;iftype&gt; &lt;ifnum&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>iftype</code> - Interface type.</li><li>• <code>ifnum</code> - Interface number.</li></ul>
<b>Mode</b>	Privileged EXEC Mode.
<b>Example</b>	<pre>Your Product# show queue-map QoS Queue Map Entries ----- IfIndex  CLASS  PriorityType  Priority Value  Mapped Queue ----- - Gi0/1    1      none         0              1</pre>
	If executed without the optional parameter, this command displays all the available queue map entries.
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>queue-map</code> – Creates a Map for a Queue with Class or regenerated priority.</li></ul>


## 26.33 show sched-hierarchy

<b>Command Objective</b>	This command displays the configured hierarchy scheduler.
<b>Syntax</b>	<code>show sched-hierarchy [interface &lt;iftype&gt; &lt;ifnum&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li><code>iftype</code> - Interface type.</li> <li><code>ifnum</code> - Interface number.</li> </ul>
<b>Mode</b>	Privileged EXEC Mode.
<b>Example</b>	<pre> Your Product# show sched-hierarchy QoS Hierarchy Scheduler Entries ----- IfIndex Hierarchy Level Sched Index NextQueue Id NextSched Id Weight Priority ----- Gi0/1      1      1      1      0      2 1          1           </pre>
	If executed without the optional parameter, this command displays all the available hierarchy scheduler entries
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><code>scheduler</code> - Creates a Scheduler and configures the Scheduler parameters.</li> <li><code>sched-hierarchy</code> - Creates a Scheduler Hierarchy.</li> </ul>

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## 26.34 show qos pbit-preference-over-Dscp

<b>Command Objective</b>	This command displays configured pbit reference for the tagged ports.
<b>Syntax</b>	<code>show qos pbit-preference-over-Dscp [interface &lt;iftype&gt; &lt;ifnum&gt; ]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>iftype</code> - Interface type.</li><li>• <code>ifnum</code> - Interface number.</li></ul>
<b>Mode</b>	Privileged EXEC Mode.
<b>Example</b>	<pre>Your Product# show qos pbit-preference-over-Dscp QoS Default Pbit Preference Entries ----- IfIndex  Pbit preference over DSCP ----- Gi0/1    Enabled</pre>
	If executed without the optional parameter, this command displays all the available scheduler entries
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>scheduler</code> - Creates a Scheduler and configures the Scheduler parameters.</li><li>• <code>sched-hierarchy</code> - Creates a Scheduler Hierarchy.</li></ul>

## 26.35 show qos def-user-priority

<b>Command Objective</b>	This command displays the configured default ingress user priority for a port.
<b>Syntax</b>	<code>show qos def-user-priority [interface &lt;iftype&gt; &lt;ifnum&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>iftype</code> - Interface type.</li><li>• <code>ifnum</code> - Interface number.</li></ul>
<b>Mode</b>	Privileged EXEC Mode.
<b>Example</b>	<pre>Your Product# show qos def-user-priority QoS Default User Priority Entries ----- IfIndex  Default User Priority ----- Gi0/1           0 Gi0/2           0 Gi0/3           0 Gi0/4           0 Gi0/5           0 Gi0/6           0 Gi0/7           0 Gi0/8           0 Gi0/9           0 Gi0/10          0 Gi0/11          0 Gi0/12          0 Gi0/13          0 Gi0/14          0 Gi0/15          0 Gi0/16          0 Gi0/17          0 Gi0/18          0 Gi0/19          0 Gi0/20          0</pre>

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Gi0/21	0
Gi0/22	0
Gi0/23	0
Gi0/24	0

---




If executed without the optional parameter, this command displays the available default ingress user priority entries for all the interface.

---

## Related Command(s)

- `qos interface` – Sets the default ingress user priority for the port.
-


## 26.36 show qos meter-stats

<b>Command Objective</b>	This command displays the Meters statistics for conform, exceed, violate packets and octets count.
<b>Syntax</b>	<code>show qos meter-stats [&lt;Meter-Id(1-65535)&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"> <li><code>&lt;Meter-Id(1-65535)&gt;</code> - Index that enumerates the Meter entries.</li> </ul>
<b>Mode</b>	Privileged EXEC Mode.
<b>Example</b>	<pre>Your Product# show qos meter-stats QoS Meter (Policer) Stats ----- Meter Index                : 1 Conform Packets            : 00 Conform Octects            : 00 Exceed Packets             : 00 Exceed Octects             : 00 Violate Packets            : 00 Violate Octects            : 0</pre>
	If executed without the optional parameter, this command displays the Meter statistics for all the available Meters.
<b>Related Command(s)</b>	<ul style="list-style-type: none"> <li><code>show meter</code> - Displays the Meter entry.</li> <li><code>set meter</code> - Sets Policy parameters such as Meter and Meter Actions.</li> </ul>

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## 26.37 show qos queue-stats

<b>Command Objective</b>	This command displays Queue statistics for EnQ, DeQ, discarded packets and octets Count, Management Algo Drop and Q occupancy.
<b>Syntax</b>	<code>show qos queue-stats [interface &lt;iftyp&gt; &lt;ifnum&gt;]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>iftyp</code> - Interface Type.</li><li>• <code>ifnum</code> - Interface Number.</li></ul>
<b>Mode</b>	Privileged EXEC Mode.
<b>Example</b>	<pre>Your Product# show qos queue-stats QoS Queue Stats ----- Interface Index           : Gi 0/1 Queue Index               : 2 EnQ Packets               : 00 EnQ Octects               : 00 DeQ Packets               : 00 DeQ Octects               : 00 Discard Packets           : 00 Discard Octects           : 00 Occupancy Octects         : 00 CongMgntAlgoDrop Octects : 00</pre>
	If executed without the optional parameter, this command displays the Queue statistics for all the available Interfaces.
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show queue</code> – Displays the configured Queues.</li></ul>

## 26.38 debug qos

<b>Command Objective</b>	<p>This command sets the debug level for QOS module.</p> <p>The no form of the command resets the debug level for QoS module.</p>
<b>Syntax</b>	<pre>debug qos {initshut   mgmt   ctrl   dump   os   failall   buffer}  no debug qos {initshut   mgmt   ctrl   dump   os   failall   buffer}</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>initshut</b> - Generates debug statements for Init and shutdown traces</li><li>• <b>mgmt</b> - Generates debug statements for Management traces</li><li>• <b>ctrl</b> - Generates debug statements for Control plane traces</li><li>• <b>dump</b> - Generates debug statements for Packet dump traces</li><li>• <b>os</b> - Generates debug statements for Traces related to all resources except buffers</li><li>• <b>failall</b> - Generates debug statements for All failure traces</li><li>• <b>buffer</b> - Generates debug statements for Buffer allocation / release traces</li></ul>
<b>Mode</b>	Privileged EXEC Mode
<b>Example</b>	<pre>Your Product# debug qos initshut</pre>



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## 26.39 qos pbit-preference

<b>Command Objective</b>	This command sets qbit preference value. Setting this to enable indicates that if a frame includes both 802.1p and a DSCP field, then the pbit field takes precedence. For DSCP to take precedence, set to Disable.
<b>Syntax</b>	<code>qos pbit-preference {enable   disable}</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>enable</code> - Enables the feature</li><li>• <code>disable</code> - Disables the feature</li></ul>
<b>Mode</b>	Interface Configuration mode
<b>Default</b>	Disabled
<b>Example</b>	<code>Your Product(config-if)# qos pbit-preference enable</code>

## 26.40 cpu rate limit queue

<b>Command Objective</b>	This command is used to configure rates for a CPU port Queues.
<b>Syntax</b>	<code>cpu rate limit queue &lt;integer(1-65535)&gt; minrate &lt;integer(1-65535)&gt; maxrate &lt;integer(1-65535)&gt;</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>&lt;integer(1-65535)&gt;</code> - Queue Identifier that uniquely identifies the queue in the system/port. This value ranges between 1 and 65535.</li><li>• <code>minrate &lt;integer(1-65535)&gt;</code> - minimum transmission rate on a cpu port. This value ranges between 1 and 65535. Minimum Rate must be less than or equal to Max Rate.</li><li>• <code>maxrate &lt;integer(1-65535)&gt;</code> - maximum transmission rate on a cpu port. This value ranges between 1 and 65535. Max Rate must be greater than or equal to Min Rate.</li></ul>
<b>Mode</b>	Global Configuration Mode
<b>Defaults</b>	Enabled
<b>Example</b>	<pre>Your Product(config)# cpu rate limit queue 1 minrate 10 maxrate 100</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>show cpu rate limit</code> – Display the rate limiting values for CPU.</li></ul>

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## 26.41 show cpu rate limit

<b>Command Objective</b>	This command is used to display the rate limiting values for CPU.
<b>Syntax</b>	<code>show cpu rate limit</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>iftype</code> - Interface type.</li><li>• <code>ifnum</code> - Interface number.</li></ul>
<b>Mode</b>	Privileged EXEC Mode.
<b>Example</b>	<pre>Your Product# show cpu rate limit QoS CPU Queue Rate Limit Table ----- Queue ID   MinRate   MaxRate ----- 1           1         65535 2           1         65535 3           1         65535 4           1         65535 5           1         65535 6           1         65535 7           1         65535 8           1         65535</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>cpu rate limit queue</code> – Configure rates for a CPU port Queues</li></ul>

## Chapter 27

### ACL

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**ACLs (Access Control Lists)** filter network traffic by controlling whether routed packets are forwarded or blocked at the router's interfaces. ACLs are used to block IP/MAC packets from being forwarded by a switch. The switch examines each packet to determine whether to forward or drop the packet, based on the criteria specified within the access lists.

Access list criteria can be the source address of the traffic, the destination address of the traffic, the upper-layer protocol or other information.

There are many reasons to configure access lists - access lists can be used to restrict contents of routing updates or to provide traffic flow control. But one of the most important reasons to configure access lists is to provide security for the network.

Access lists must be used to provide a basic level of security for accessing the network. If access lists has not been configured on the router, all packets passing through the router can be allowed onto all parts of the network.

For example, access lists can allow one host to access a part of the network and prevent another host from accessing the same area.

The list of CLI commands for the configuration of ACL is as follows:

- [ip access-list](#)
- [mac access-list extended](#)
- [permit - standard mode](#)
- [deny - standard mode](#)
- [copy-to-cpu - standard mode](#)
- [permit- ip/ospf/pim/protocol type](#)

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- [permit ipv6](#)
- [deny - ip/ospf/pim/protocol type](#)
- [deny ipv6](#)
- [copy-to-cpu - ip / ospf / pim / protocol-type](#)
- [copy-to-cpu ipv6](#)
- [permit tcp](#)
- [deny tcp](#)
- [copy-to-cpu tcp](#)
- [permit udp](#)
- [deny udp](#)
- [copy-to-cpu udp](#)
- [permit icmp](#)
- [deny icmp](#)
- [copy-to-cpu icmp](#)
- [permit icmpv6](#)
- [deny icmpv6](#)
- [copy-to-cpu icmpv6](#)
- [ip access-group](#)
- [mac access-group](#)
- [permit - MAC](#)
- [deny - MAC](#)
- [copy-to-cpu - MAC](#)
- [show access-lists](#)
- [storm-control](#)
- [rate-limit-output](#)

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## 27.1 ip access-list

**Command Objective** This command creates IP ACLs and enters the IP Access-list configuration mode. Standard access lists create filters based on IP address and network mask only (L3 filters only). Extended access lists enables specification of filters based on the type of protocol, range of TCP/UDP ports as well as the IP address and network mask (Layer 4 filters).

Depending on the standard or extended option chosen by the user, this command returns a corresponding IP Access list configuration mode.

The no form of the command deletes the IP access-list.

**Syntax**

```
ip access-list {standard <access-list-number (1-1000)> |
extended <access-list-number (1001-65535)> }

no ip access-list {standard <access-list-number (1-1000)> |
extended <access-list-number (1001-65535)> }
```

**Parameter Description**

- **standard <access-list-number (1-1000)>** - Configures the standard access-list number. this value ranges between 1 and 1000
- **extended <access-list-number (1001-65535)>** - Configures the extended access-list number. This value ranges between 1001 and 65535.

**Mode** Global Configuration Mode



ACLs on the system perform both access control and Layer 3 field classification. To define Layer 3 fields' access-lists the ip access-list command must be used.

**Example** Your Product (config)# ip access-list standard 1

**Related Command(s)**

- **permit - standard mode** - Specifies the packets to be forwarded depending upon the associated parameters
- **deny - standard mode** - Denies traffic if the conditions defined in the deny statement are matched
- **copy-to-cpu - standard mode** - Copies the IP control packets to control plane CPU with or without switching of packets based on the configured parameters.
- **permit- ip/ospf/pim/protocol type** - Allows traffic for a particular protocol packet if the conditions defined in the permit statement are matched

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- **permit ipv6** - Specifies IP packets to be forwarded based on protocol and associated parameters.
- **deny** - ip/ospf/pim/protocol type- Denies traffic for a particular protocol packet if the conditions defined in the deny statement are matched
- **copy-to-cpu - ip / ospf / pim / protocol-type** - Copies the IP control packets of all type of protocols to control plane CPU with or without switching of packets based on the configured parameters.
- **deny ipv6** - Specifies IPv6 packets to be rejected based on protocol and associated parameters.
- **copy-to-cpu ipv6** - Copies the IPv6 control packets to control plane CPU with or without switching of packets based on the configured parameters.
- **permit tcp** - Specifies the TCP packets to be forwarded based on the associated parameters
- **deny tcp** - Specifies the TCP packets to be rejected based on the associated parameters
- **copy-to-cpu tcp** - Copies the TCP control packets to control plane CPU with or without switching of packets based on the configured parameters.
- **permit udp** - Specifies the UDP packets to be forwarded based on the associated parameters
- **deny udp** - Specifies the UDP packets to be rejected based on the associated parameters
- **copy-to-cpu udp** - Copies the UDP control packets to control plane CPU with or without switching of packets based on the configured parameters.
- **permit icmp** - Specifies the ICMP packets to be forwarded based on the IP address and the associated parameters
- **deny icmp** - Specifies the ICMP packets to be rejected based on the IP address and associated parameters
- **copy-to-cpu icmp** - Copies the ICMP control packets to control plane CPU with or without switching of packets based on the configured parameters.
- **ip access-group** - Enables access control for the packets on the interface
- **show access-lists** - Displays the access list configuration

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## 27.2 mac access-list extended

---

**Command Objective** This command creates Layer 2 MAC ACLs, that is, this command creates a MAC access-list and returns the MAC-Access list configuration mode to the user. This value ranges between 1 and 65535.

The no form of the command deletes the MAC access-list.

---

**Syntax** `mac access-list extended <access-list-number (1-65535)>`  
`no mac access-list extended <short (1-65535)>`

---

**Mode** Global Configuration Mode



ACLs on the system perform both access control and layer 2 field classification. To define Layer 2 access lists, the mac access-list command must be used.

---

**Example** `Your Product (config)# mac access-list extended 5`

---

**Related Command(s)**

- `mac access-group` - Applies a MAC access control list (ACL) to a Layer 2 interface.
- `permit - MAC` - Specifies the packets to be forwarded based on the MAC address and the associated parameters
- `deny - MAC` - Specifies the packets to be rejected based on the MAC address and the associated parameters
- `copy-to-cpu - MAC` - Copies the MAC protocol control packets to control plane CPU with or without switching of packets based on the configured parameters.
- `show access-lists` - Displays the access lists configuration.

---



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## 27.3 permit - standard mode

<b>Command Objective</b>	This command specifies the packets to be forwarded depending upon the associated parameters. Standard IP access lists use source addresses for matching operations.
<b>Syntax</b>	<pre>permit { any   host &lt;src-ip-address&gt;   &lt;src-ip-address&gt; &lt;mask&gt; } [ { any   host &lt;dest-ip-address&gt;   &lt;dest-ip- address&gt; &lt;mask&gt; } ]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>any host &lt;src-ip-address&gt;   &lt; src-ip-address&gt;&lt;mask&gt;</b> - Source IP address can be<ul style="list-style-type: none"><li>– 'any' or</li><li>– the word 'host' and the dotted decimal address or</li><li>– the IP address of the host that the packet is from and the network mask to use with the source IP address</li></ul></li><li>• <b>any host &lt;dest-ip-address&gt;   &lt; dest-ip-address &gt;&lt;mask&gt;</b> - Destination IP address can be<ul style="list-style-type: none"><li>– 'any' or</li><li>– the word 'host' and the dotted decimal address or</li><li>– the IP address of the host that the packet is destined for and the network mask to use with the destination IP address</li></ul></li></ul>
<b>Mode</b>	IP ACL Configuration (standard)
<b>Example</b>	<pre>Your Product(config-std-nacl)# permit host 100.0.0.10 host 10.0.0.1</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>ip access-list</b> - Creates IP ACLs and enters the IP Access-list configuration mode</li><li>• <b>deny - standard mode</b> - Denies traffic if the conditions defined in the deny statement are matched</li><li>• <b>show access-lists</b> - Displays the access list configuration</li></ul>

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## 27.4 deny - standard mode

<b>Command Objective</b>	This command denies traffic if the conditions defined in the deny statement are matched.
<b>Syntax</b>	<pre>deny{ any   host &lt;src-ip-address&gt;   &lt;src-ip-address&gt; &lt;mask&gt; } [ { any   host &lt;dest-ip-address&gt;   &lt;dest-ip-address&gt; &lt;mask&gt; } ]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>any host src-ip-address   &lt;src-ip-address&gt; &lt;mask&gt;</b> - Source IP address can be<ul style="list-style-type: none"><li>– 'any' or</li><li>– the word 'host' and the dotted decimal address or</li><li>– The network number of the host that the packet is from and the network mask to use with the source IP address</li></ul></li><li>• <b>any host dest-ip-address   &lt;dest-ip-address&gt;&lt;mask&gt;</b> - Destination IP address can be<ul style="list-style-type: none"><li>– 'any' or</li><li>– the word 'host' and the dotted decimal address or</li><li>– the network number of the host that the packet is destined for and the network mask to use with the destination IP address</li></ul></li></ul>
<b>Mode</b>	IP ACL Configuration (standard)
<b>Example</b>	<pre>Your Product(config-std-nacl)# deny host 100.0.0.10 any</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>ip access-list</b> - Creates IP ACLs and enters the IP Access-list configuration mode</li><li>• <b>permit - standard mode</b> - Specifies the packets to be forwarded depending upon the associated parameters</li><li>• <b>show access-lists</b> - Displays the access list configuration</li></ul>

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## 27.5 copy-to-cpu - standard mode

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**Command Objective** This command copies the IP control packets to control plane CPU with or without switching of packets based on the configured parameters.

---

**Syntax** `copy-to-cpu { any | host <src-ip-address> | <src-ip-address> <mask> } [ { any | host <dest-ip-address> | <dest-ip-address> <mask> } ] [noswitching]`

---

**Parameter Description**

- `any | host <src-ip-address> | <src-ip-address> <mask>` - Copies the IP control packets to control plane CPU with or without switching of packets based on the following source address configuration:
  - `any` - Copies all control packets. Does not check for the source IP address in the packets.
  - `host` - Copies only the control packets having the specified unicast host network IP address as the source address.
  - `<src-ip-address> <mask>` - Copies only the control packets having the specified unicast source IP address and mask.
- `any | host <dest-ip-address> | <dest-ip-address> <mask>` - Copies the IP control packets to control plane CPU with or without switching of packets based on the following destination address configuration:
  - `any` - Copies all control packets. Does not check for the destination IP address in the packets.
  - `host` - Copies only the control packets having the specified host network IP address as the destination address.
  - `<dest-ip-address> <mask>` - Copies only the control packets having the specified destination IP address and mask.
- `noswitching` - Copies the IP control packets to control plane CPU without switching of packets.
  -  This parameter is not supported in some models due to hardware limitation.

---

**Mode** ACL Standard Access List Configuration Mode

---

**Defaults**

- `any | host <src-ip-address> | <src-ip-address> <mask>` - any
- `any | host <dest-ip-address> | <dest-ip-address> <mask>` - any

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**Example**

Your Product (config-std-nacl)# `copy-to-cpu host 30.0.0.4 any noswitching`

---


**Related Command(s)**

- `ip access-list` - Creates IP ACLs and enters the IP Access-list configuration mode
  - `show access-lists` - Displays the access lists configuration.
-

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## 27.6 permit-ip/ospf/pim/protocol type

<b>Command Objective</b>	This command allows traffic for a particular protocol packet if the conditions defined in the permit statement are matched.
<b>Syntax</b>	<pre>permit { ip   ospf   pim   &lt;protocol-type (1-255)&gt; } { any   host &lt;src-ip-address&gt;   &lt;src-ip-address&gt; &lt;mask&gt; } { any   host &lt;dest-ip-address&gt;   &lt;dest-ip-address&gt; &lt;mask&gt; } [ {tos{max-reliability   max-throughput   min-delay   normal  &lt;value (0-7)&gt;}   dscp {&lt;value (0-63 )&gt;} } ] [priority &lt;value (1-255)&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>ip   ospf   pim   &lt;protocol-type (1-255)&gt;</b> - Type of protocol for the packet. It can also be a protocol number.</li><li>• <b>any   host &lt;src-ip-address&gt;   &lt;src-ip-address&gt; &lt;mask&gt;</b> - Source IP address can be<ul style="list-style-type: none"><li>– 'any' or</li><li>– the dotted decimal address or</li><li>– the IP Address of the network or the host that the packet is from and the network mask to use with the source address.</li></ul></li><li>• <b>any   host &lt;dest-ip-address&gt;   &lt;dest-ip-address&gt; &lt;mask&gt;</b> - Destination IP address can be<ul style="list-style-type: none"><li>– 'any' or</li><li>– the dotted decimal address or</li><li>– the IP Address of the network or the host that the packet is destined for and the network mask to use with the destination address</li></ul></li><li>• <b>tos</b> - Type of service. Can be max-reliability, max throughput, min-delay, normal or a range of values from 0 to 7.</li><li>• <b>dscp</b> - Differentiated services code point provides the quality of service control. The various options available are:<ul style="list-style-type: none"><li>– <b>0-63</b> - Differentiated services code point value</li></ul></li><li>• <b>priority</b> - The priority of the L3 filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules. Higher value of 'filter priority' implies a higher priority.  This parameter is not supported in some models due to hardware limitations.</li></ul>
<b>Mode</b>	ACL Extended Access List Configuration Mode

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## Defaults

- none



- Protocol type with the value 255 indicates that protocol can be anything and it will not be checked against the action to be performed.

---

## Example

```
Your Product (config-ext-nacl)# permit 200 host 100.0.0.10  
any tos 6 load balance src-ip
```

---



## Related Command(s)

- `ip access-list` - Creates IP ACLs and enters the IP Access-list configuration mode
  - `deny - ip/ospf/pim/protocol type` - Denies traffic for a particular protocol packet if the conditions defined in the deny statement are matched
  - `show access-lists` - Displays the access list configuration
-

# Supermicro Switch Configuration CLI Guide

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## 27.7 permit ipv6

<b>Command Objective</b>	This command specifies IP packets to be forwarded based on protocol and associated parameters.
<b>Syntax</b>	<pre>permit ipv6 { flow-label &lt;integer(1-65535)&gt;   {any   host &lt;ip6_addr&gt; &lt;integer(0-128)&gt; } { any   host &lt;ip6_addr&gt; &lt;integer(0-128)&gt; } }</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>flow-label</b> - Flow identifier in IPv6 header.</li><li>• <b>any   host &lt;ip6_addr&gt; &lt;integer(0-128)&gt;</b> - Source address of the host / any host.</li><li>• <b>any   host &lt;ip6_addr&gt; &lt;integer(0-128)&gt;</b> - Destination address of the host / any host.</li></ul> <p> This parameter is not supported in some models due to hardware limitations.</p>
<b>Mode</b>	ACL Extended Access List Configuration Mode
<b>Defaults</b>	priority - 1
	Flow label cannot be configured along with either source/destination IP address.
<b>Example</b>	<pre>Your Product (config-ext-nacl)# permit ipv6 host c004::04 28 any load-balance src-ip</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>ip access-list</b> - Creates IP ACLs and enters the IP Access-list configuration mode</li><li>• <b>show access-lists</b> - Displays the access lists configuration.</li></ul>

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## 27.8 deny - ip/ospf/pim/protocol type

<b>Command Objective</b>	This command denies traffic for a particular protocol packet if the conditions defined in the deny statement are matched.
<b>Syntax</b>	<pre>deny { ip   ospf   pim   &lt;protocol-type (1-255)&gt; } { any   host &lt;src-ip-address&gt;   &lt;src-ip-address&gt; &lt;mask&gt; } { any   host &lt;dest-ip-address&gt;   &lt;dest-ip-address&gt; &lt;mask&gt; } [ {tos{max-reliability   max-throughput   min-delay   normal  &lt;value (0-7)&gt;}}   dscp {&lt;value (0-63)&gt; }} ] [ priority &lt;value (1-255)&gt; ]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>ip   ospf   pim   &lt;protocol-type (1-255)&gt;</b> - Type of protocol for the packet. It can also be a protocol number.</li><li>• <b>any   host &lt;src-ip-address&gt;   &lt;src-ip-address&gt; &lt;mask&gt;</b> - Source IP address can be<ul style="list-style-type: none"><li>– 'any' or</li><li>– the word 'host' and the dotted decimal address or</li><li>– number of the network or the host that the packet is from and the network mask to use with the source address</li></ul></li><li>• <b>any   host &lt;dest-ip-address&gt;   &lt;dest-ip-address&gt; &lt;mask&gt;</b> - Destination IP address can be<ul style="list-style-type: none"><li>– 'any' or</li><li>– the word 'host' and the dotted decimal address or</li><li>– number of the network or the host that the packet is destined for and the network mask to use with the destination address</li></ul></li><li>• <b>tos</b> - Type of service. Can be max-reliability, max throughput, min-delay, normal or a range of values from 0 to 7.</li><li>• <b>dscp</b> - Differentiated services code point provides the quality of service control. The various options available are:<ul style="list-style-type: none"><li>– <b>0-63</b> - Differentiated services code point value</li></ul></li><li>• <b>priority</b> - The priority of the L3 filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules. Higher value of 'filter priority' implies a higher priority.  This parameter is not supported in some models due to hardware limitations.</li></ul>
<b>Mode</b>	ACL Extended Access List Configuration Mode



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## Defaults

- None



- Protocol type with the value 255 indicates that protocol can be anything and it will not be checked against the action to be performed.
- Service Vlan, Service Vlan Priority, Customer Vlan and Customer Vlan Priority options are applicable only for Metro Solution, when the bridge mode is "Provider Bridge".

---

## Example

```
Your Product (config-ext-nacl)# deny ospf any host  
10.0.0.1 tos max-throughput
```

---



## Related Command(s)

- **ip access-list** - Creates IP ACLs and enters the IP Access-list configuration mode
  - **permit- ip/ospf/pim/protocol type** - Allows traffic for a particular protocol packet if the conditions defined in the permit statement are matched
  - **show access-lists** - Displays the access list configuration
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## 27.9 deny ipv6

<b>Command Objective</b>	This command specifies IPv6 packets to be rejected based on protocol and associated parameters.
<b>Syntax</b>	<pre>deny ipv6 { flow-label &lt;integer(1-65535)&gt;   {any   host &lt;ip6_addr&gt; &lt;integer(0-128)&gt; } { any   host &lt;ip6_addr&gt; &lt;integer(0-128)&gt; } }</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>flow-label</b> - Flow identifier in IPv6 header.</li><li>• <b>any   host &lt;ip6_addr&gt; &lt;integer(0-128)&gt;</b> - Source address of the host / any host.</li><li>• <b>any   host &lt;ip6_addr&gt; &lt;integer(0-128)&gt;</b> - Destination address of the host / any host.  This parameter is not supported in some models due to hardware limitations.</li></ul>
<b>Mode</b>	ACL Extended Access List Configuration Mode
<b>Defaults</b>	priority - 1
	Flow label cannot be configured along with either source/destination IP address.
<b>Example</b>	<pre>Your Product (config-ext-nacl)# deny ipv6 host c004::04 28 any</pre> <pre>Your Product (config-ext-nacl)# deny ipv6 flow-label 40</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>ip access-list</b> - Creates IP ACLs and enters the IP Access-list configuration mode</li><li>• <b>show access-lists</b> - Displays the access lists configuration.</li></ul>

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## 27.10 copy-to-cpu - ip / ospf / pim / protocol-type

---

**Command Objective** This command copies the IP control packets of all type of protocols to control plane CPU with or without switching of packets based on the configured parameters.

**Syntax**

```
copy-to-cpu { ip | ospf | pim | <protocol-type (1-255)> } {  
any | host <src-ip-address> | <src-ip-address> <mask> } {  
any | host <dest-ip-address> | <dest-ip-address> <mask> }  
[ {tos{max-reliability | max-throughput | min-delay |  
normal | <value (0-7)> } | dscp <value (0-63)> } ] [priority  
<value (1-255)>] [noswitching]
```


**Parameter Description**

- **ip | ospf | pim | <protocol-type (1-255)>** - Copies the IP control packets to control plane CPU with or without switching of packets based on the following protocol type configuration:
  - **ip** - Copies only the control packets of IP protocol.
  - **ospf** - Copies only the control packets of OSPF protocol.
  - **pim** - Copies only the control packets of PIM protocol.
  - **<protocol-type (1-255)>** - Copies only the control packets of administrator specified protocol type. This value ranges between 1 and 255.
- **any | host <src-ip-address> | <src-ip-address> <mask>** - Copies the IP control packets to control plane CPU with or without switching of packets based on the following source address configuration:
  - **any** - Copies all control packets. Does not check for the source IP address in the packets.
  - **host** - Copies only the control packets having the specified unicast host network IP address as the source address.
  - **<src-ip-address> <mask>** - Copies only the control packets having the specified unicast source IP address and mask.
- **any | host <dest-ip-address> | <dest-ip-address> <mask>** - Copies the IP control packets to control plane CPU with or without switching of packets based on the following destination address configuration:
  - **any** - Copies all control packets. Does not check for the destination IP address in the packets.
  - **host** - Copies only the control packets having the specified host IP address as the destination address.
  - **<dest-ip-address> <mask>** - Copies only the control packets having the specified destination IP address and mask.

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- **tos** - Copies the IP control packets to control plane CPU with or without switching of packets based on the following type of service configuration:
  - **max-reliability** - Copies only the control packets having TOS field set as high reliability.
  - **max-throughput** - Copies only the control packets having TOS field set as high throughput.
  - **min-delay** - Copies only the control packets having TOS field set as low delay.
  - **normal** - Copies all control packets. Does not check for the TOS field in the packets.
  - **<value (0-7)>** - Copies the control packets based on the TOS value set. The value ranges between 0 and 7. This value represents different combination of TOS.
    - **0** - Copies all control packets. Does not check for the TOS field in the packets.
    - **1** - Copies only the control packets having TOS field set as high reliability.
    - **2** - Copies only the control packets having TOS field set as high throughput.
    - **3** - Copies the control packets having TOS field set either as high reliability or high throughput.
    - **4** - Copies only the control packets having TOS field set as low delay.
    - **5** - Copies the control packets having TOS field set either as low delay or high reliability.
    - **6** - Copies the control packets having TOS field set either as low delay or high throughput.
    - **7** - Copies the control packets having TOS field set either as low delay or high reliability or high throughput.
- **dscp** - Copies only the control packets having the specified DSCP value. This value ranges between 0 and 63.
- **priority** - Copies only the control packets having the specified L2 priority value. This value ranges between 1 and 255.
- **noswitching** - Copies the IP control packets to control plane CPU without switching of packets.
  -  This parameter is not supported in some models due to hardware limitations.

---

**Mode**

ACL Extended Access List Configuration Mode

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## Defaults

- `ip | ospf | pim | <protocol-type (1-255)>` - Control packets of all type of protocols are copied.
- `any | host <src-ip-address> | <src-ip-address> <mask>` - any
- `any | host <dest-ip-address> | <dest-ip-address> <mask>` - any
- `dscp - -1` (that is, the packets are not checked for DSCP value)
- `priority - 1`

---

## Example

```
Your Product (config-ext-nacl)# copy-to-cpu ospf host  
30.0.0.4 any tos min-delay priority 2
```


---

## Related Command(s)

- `ip access-list` - Creates IP ACLs and enters the IP Access-list configuration mode
  - `show access-lists` - Displays the access lists configuration.
-

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## 27.11 copy-to-cpu ipv6

<b>Command Objective</b>	This command copies the IPv6 control packets to control plane CPU with or without switching of packets based on the configured parameters.
<b>Syntax</b>	<pre>copy-to-cpu ipv6 { flow-label &lt;integer(1-65535)&gt;   { any   host &lt;ip6_addr&gt; &lt;integer(0-128)&gt; } { any   host &lt;ip6_addr&gt; &lt;integer(0-128)&gt; } } [noswitching]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>flow-label</b> - Copies only the IPv6 control packets having the specified flow identifier. This value ranges between 1 and 65535.</li><li>• <b>any   host &lt;ip6_addr&gt; &lt;integer(0-128)&gt;</b> - Copies the IPv6 control packets to control plane CPU with or without switching of packets based on the following source address configuration:<ul style="list-style-type: none"><li>– <b>any</b> - Copies all control packets. Does not check for the source IPv6 address in the packets.</li><li>– <b>host</b> - Copies only the control packets having the specified source IPv6 address and prefix length.</li></ul></li><li>• <b>any   host &lt;ip6_addr&gt; &lt;integer(0-128)&gt;</b> - Copies the IPv6 control packets to control plane CPU with or without switching of packets based on the following destination address configuration:<ul style="list-style-type: none"><li>– <b>any</b> - Copies all control packets. Does not check for the destination IPv6 address in the packets.</li><li>– <b>host</b> - Copies only the control packets having the specified destination IPv6 address and prefix length.</li></ul></li><li>• <b>noswitching</b> - Copies the IPv6 control packets to control plane CPU without switching of packets.  This parameter is not supported in some models due to hardware limitations.</li></ul>
<b>Mode</b>	ACL Extended Access List Configuration Mode
<b>Defaults</b>	<ul style="list-style-type: none"><li>• flow-label - 0 (that is, the packets are not checked for flow identifier)</li><li>• any   host &lt;ip6_addr&gt; &lt;integer(0-128)&gt; - any</li></ul>
<b>Example</b>	<pre>Your Product (config-ext-nacl)# copy-to-cpu ipv6 flow-label 40</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>ip access-list</b> - Creates IP ACLs and enters the IP Access-list configuration mode</li><li>• <b>show access-lists</b> - Displays the access lists configuration.</li></ul>

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## 27.12 permit tcp

---

**Command Objective** This command specifies the TCP packets to be forwarded based on the associated parameters.

---

**Syntax**

```
permit tcp {any | host <src-ip-address> | <src-ip-address> <src-mask> } [{gt <port-number (1-65535)> | lt <port-number (1-65535)> | eq <port-number (1-65535)> | range <port-number (1-65535)> <port-number (1-65535)>}] { any | host <dest-ip-address> | <dest-ip-address> <dest-mask> } [{gt <port-number (1-65535)> | lt <port-number (1-65535)> | eq <port-number (1-65535)> | range <port-number (1-65535)> <port-number (1-65535)>}] [{ ack | rst }] [{tos{max-reliability|max-throughput|min-delay|normal|<tos-value(0-7)>}] | dscp {<value (0-63)>}] [ priority <value(1-255)>]
```

---

**Parameter Description**

- **tcp** - Transport Control Protocol
- **any| host <src-ip-address>|<src-ip-address> < src-mask >** - Source IP address can be
  - ‘any’ or
  - the dotted decimal address OR
  - the IP address of the network or the host that the packet is from and the network mask to use with the source address
- **port-number** - Port Number. The input for the source and the destination port-number is prefixed with one of the following operators.
  - eq=equal
  - lt=less than
  - gt=greater than
  - range=a range of ports; two different port numbers must be specified
- **any|host<dest-ip-address> |<dest-ip-address> < dest-mask >** - Destination IP address can be
  - ‘any’ or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is destined for and the network mask to use with the destination address
- **ack** - TCP ACK bit to be checked against the packet. It can be establish (1), non-establish (2) or any (3).
- **rst** - TCP RST bit to be checked against the packet. It can be set (1), notset (2) or any (3).
- **tos** - Type of service. Can be max-reliability, max throughput, min-delay,


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normal or a range of values from 0 to 7.

- **dscp** - Differentiated services code point provides the quality of service control. The various options available are:
  - **0-63** - Differentiated services code point value
- **priority** - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules. Higher value of 'filter priority' implies a higher priority.

 This parameter is not supported in some models due to hardware limitations.

---

<b>Mode</b>	ACL Extended Access List Configuration Mode
<b>Defaults</b>	<ul style="list-style-type: none"><li>• tos-value - 0</li><li>• ack - 'any' (3) [indicates that the TCP ACK bit will not be checked to decide the action]</li><li>• rst - 'any' (3) [indicates that the TCP RST bit will not be checked to decide the action]</li><li>• dscp - -1</li><li>• priority - 1</li></ul>
<b>Example</b>	Your Product (config-ext-nacl)# permit tcp any 10.0.0.1 load-balance scr-ip
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>ip access-list</b> - Creates IP ACLs and enters the IP Access-list configuration mode</li><li>• <b>deny tcp</b> - Specifies the TCP packets to be rejected based on the associated parameters</li><li>• <b>show access-lists</b> - Displays the access list configuration</li></ul>

---



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## 27.13 deny tcp

---

**Command Objective** This command specifies the TCP packets to be rejected based on the associated parameters.

---

**Syntax**

```
deny tcp {any | host <src-ip-address> | <src-ip-address> <src-mask> } [{gt <port-number (1-65535)> | lt <port-number (1-65535)> | eq <port-number (1-65535)> | range <port-number (1-65535)> <port-number (1-65535)>}] {any | host <dest-ip-address> | <dest-ip-address> <dest-mask> } [{gt <port-number (1-65535)> | lt <port-number (1-65535)> | eq <port-number (1-65535)> | range <port-number (1-65535)> <port-number (1-65535)>}] [{ack | rst}] [{tos{max-reliability|max-throughput|min-delay|normal|<tos-value(0-7)>}} | dscp {<value (0-63)>}] [ priority <value (1-255)>]
```

---

**Parameter Description**


- **tcp** - Transmission control protocol
  - **any| host <src-ip-address>|<src-ip-address> <src-mask>** - Source IP address can be
    - ‘any’ or
    - the word ‘host’ and the dotted decimal address or
    - number of the network or the host that the packet is from and the network mask to use with the source address
  - **port-number** - Port Number. The input for the source and the destination port-number is prefixed with one of the following operators.
    - eq=equal
    - lt=less than
    - gt=greater than
    - range=a range of ports; two different port numbers must be specified
  - **any|host <dest-ip-address>|<dest-ip-address> <dest-mask>** - Destination IP address can be
    - ‘any’ or
    - the word ‘host’ and the dotted decimal address or
    - number of the network or the host that the packet is destined for and the network mask to use with the destination address
  - **ack** - TCP ACK bit to be checked against the packet. It can be establish (1), non-establish (2) or any (3)
  - **rst** - TCP RST bit to be checked against the packet. It can be set (1), notset (2) or any (3)
  - **tos** - Type of service. Can be max-reliability, max throughput, min-delay,
-

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normal or a range of values from 0 to 7.

- **dscp** - Differentiated services code point provides the quality of service control. The various options available are:
  - **0-63** - Differentiated services code point value
- **priority** - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules. Higher value of 'filter priority' implies a higher priority.

 This parameter is not supported in some models due to hardware limitations.

---

<b>Mode</b>	ACL Extended Access List Configuration Mode
<b>Defaults</b>	<ul style="list-style-type: none"><li>• tos-value - 0</li><li>• ack - 'any' (3) [indicates that TCP ACK bit will not be checked to decide the action]</li><li>• rst - any' (3) [indicates that TCP RST bit will not be checked to decide the action]</li><li>• dscp - -1</li><li>• priority - 1</li></ul>
<b>Example</b>	<pre>Your Product (config-ext-nacl)# deny tcp 100.0.0.10 255.255.255.0 eq 20 any</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>ip access-list</b> - Creates IP ACLs and enters the IP Access-list configuration mode</li><li>• <b>permit tcp</b> - Specifies the TCP packets to be forwarded based on the associated parameters</li><li>• <b>show access-lists</b> - Displays the access list configuration</li></ul>

---

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## 27.14 copy-to-cpu tcp

<b>Command Objective</b>	This command copies the TCP control packets to control plane CPU with or without switching of packets based on the configured parameters.
<b>Syntax</b>	<pre>copy-to-cpu tcp {any   host &lt;src-ip-address&gt;   &lt;src-ip-address&gt; &lt;src-mask&gt; } [{gt &lt;port-number (1-65535)&gt;   lt &lt;port-number (1-65535)&gt;   eq &lt;port-number (1-65535)&gt;   range &lt;port-number (1-65535)&gt; &lt;port-number (1-65535)&gt;}] { any   host &lt;dest-ip-address&gt;   &lt;dest-ip-address&gt; &lt;dest-mask&gt; } [{gt &lt;port-number (1-65535)&gt;   lt &lt;port-number (1-65535)&gt;   eq &lt;port-number (1-65535)&gt;   range &lt;port-number (1-65535)&gt; &lt;port-number (1-65535)&gt;}] [{ack   rst}] [{tos{max-reliability max-throughput min-delay normal &lt;tos-value(0-7)&gt;} dscp &lt;value (0-63)&gt;}] [priority &lt;value(1-255)&gt;] [noswitching]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>any   host &lt;src-ip-address&gt;   &lt;src-ip-address&gt; &lt;src-mask&gt;</b> - Copies the TCP control packets to control plane CPU with or without switching of packets based on the following source address configuration:<ul style="list-style-type: none"><li>– <b>any</b> - Copies all control packets. Does not check for the source IP address in the packets.</li><li>– <b>host</b> - Copies only the control packets having the specified unicast host network IP address as the source address.</li><li>– <b>&lt;src-ip-address&gt; &lt;src-mask&gt;</b> - Copies only the control packets having the specified unicast source IP address and mask.</li></ul></li><li>• <b>gt</b> - Copies only the TCP control packets having the TCP source / destination port numbers greater than the specified port number. This value ranges between 1 and 65535.</li><li>• <b>lt</b> - Copies only the TCP control packets having the TCP source / destination port numbers lesser than the specified port number. This value ranges between 1 and 65535.</li><li>• <b>eq</b> - Copies only the TCP control packets having the specified TCP source / destination port numbers. This value ranges between 1 and 65535.</li><li>• <b>range</b> - Copies only the TCP control packets having the TCP source / destination port numbers within the specified range. This value ranges between 1 and 65535. This value specifies the minimum port number and the maximum port number values.</li><li>• <b>any   host &lt;dest-ip-address&gt;   &lt;dest-ip-address&gt; &lt;dest-mask&gt;</b> - Copies the TCP control packets to control plane CPU with or without switching of packets based on the following destination address configuration:</li></ul>



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- **any** - Copies all control packets. Does not check for the destination IP address in the packets.
- **host** - Copies only the control packets having the specified host network IP address as the destination address.
- **<dest-ip-address> <dest-mask>** - Copies only the control packets having the specified destination IP address and mask.
- **ack | rst** - Copies the TCP control packets to control plane CPU with or without switching of packets based on the following configuration:
  - **ack** - Copies only the control packets having the ACK bit set.
  - **rst** - Copies only the control packets having the RST bit set.
- **tos** - Copies the TCP control packets to control plane CPU with or without switching of packets based on the following type of service configuration:
  - **max-reliability** - Copies only the control packets having TOS field set as high reliability.
  - **max-throughput** - Copies only the control packets having TOS field set as high throughput.
  - **min-delay** - Copies only the control packets having TOS field set as low delay.
  - **normal** - Copies all control packets. Does not check for the TOS field in the packets.
  - **<value (0-7)>** - Copies the control packets based on the TOS value set. The value ranges between 0 and 7. This value represents different combination of TOS.
    - **0** - Copies all control packets. Does not check for the TOS field in the packets.
    - **1** - Copies only the control packets having TOS field set as high reliability.
    - **2** - Copies only the control packets having TOS field set as high throughput.
    - **3** - Copies the control packets having TOS field set either as high reliability or high throughput.
    - **4** - Copies only the control packets having TOS field set as low delay.
    - **5** - Copies the control packets having TOS field set either as low delay or high reliability.
    - **6** - Copies the control packets having TOS field set either as low delay or high throughput.
    - **7** - Copies the control packets having TOS field set either as low delay or high reliability or high throughput.
- **dscp** - Copies only the TCP control packets having the specified DSCP value. This value ranges between 0 and 63.
- **priority** - Copies only the TCP control packets having the specified L2 priority value. This value ranges between 1 and 255.

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	<ul style="list-style-type: none"><li>• <b>noswitching</b> - Copies the TCP control packets to control plane CPU without switching of packets.  This parameter is not supported in some models due to hardware limitations.</li></ul>
<b>Mode</b>	ACL Extended Access List Configuration Mode
<b>Defaults</b>	<ul style="list-style-type: none"><li>• any   host &lt;src-ip-address&gt;   &lt;src-ip-address&gt; &lt;src-mask&gt; - any</li><li>• gt - 0 (that is, the packets are not checked for TCP port number)</li><li>• lt - 0 (that is, the packets are not checked for TCP port number)</li><li>• eq - 0 (that is, the packets are not checked for TCP port number)</li><li>• range - 0 for minimum port number, 65535 for maximum port number.</li><li>• ack - any (that is, the packets are not checked for ACK bit)</li><li>• rst - any (that is, the packets are not checked for RST bit)</li><li>• any   host &lt;dest-ip-address&gt;   &lt;dest-ip-address&gt; &lt;dest-mask&gt; - any</li><li>• dscp - -1 (that is, the packets are not checked for DSCP value)</li><li>• priority - 1</li></ul>
	The TCP port number details can be set either for source or destination. The default value is applied for destination TCP port number, if the source TCP port number is configured or vice-versa.
<b>Example</b>	<pre>Your Product (config-ext-nacl)# copy-to-cpu tcp any eq 300 any tos 1 priority 2 noswitching</pre>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>ip access-list</b> - Creates IP ACLs and enters the IP Access-list configuration mode</li><li>• <b>show access-lists</b> - Displays the access lists configuration.</li></ul>

---

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## 27.15 permit udp

---

**Command Objective** This command specifies the UDP packets to be forwarded based on the associated parameters.

---

**Syntax**

```
permit udp { any | host <src-ip-address> | <src-ip-address> <src-mask> } [ { gt <port-number (1-65535)> | lt <port-number (1-65535)> | eq <port-number (1-65535)> | range <port-number (1-65535)> <port-number (1-65535)> } ] { any | host <dest-ip-address> | <dest-ip-address> <dest-mask> } [ { gt <port-number (1-65535)> | lt <port-number (1-65535)> | eq <port-number (1-65535)> | range <port-number (1-65535)> <port-number (1-65535)> } ] [ { tos { max-reliability | max-throughput | min-delay | normal | <tos-value (0-7)> } | dscp { <value (0-63)> } ] [ priority <(1-255)> ]
```

---


**Parameter Description**

- **udp** - User Datagram Protocol
  - **any| host <src-ip-address>|<src-ip-address><src-mask>** - Source IP address can be
    - 'any' or
    - the word 'host' and the dotted decimal address or
    - number of the network or the host that the packet is from and the network mask to use with the source address
  - **port-number** - Port Number. The input for the source and the destination port-number is prefixed with one of the following operators.
    - eq=equal
    - lt=less than
    - gt=greater than
    - range=a range of ports; two different port numbers must be specified
  - **any|host <dest-ip-address>|<dest-ip-address> <dest-mask>** - Destination IP address can be
    - 'any' or
    - the word 'host' and the dotted decimal address or
    - number of the network or the host that the packet is destined for and the network mask to use with the destination address
  - **tos {max-reliability | max-throughput | min-delay | normal | <value (0-7)> | dscp <value(0-63)>}** - Type of service. Can be max-reliability, max throughput, min-delay, normal or a range of values from 0 to 7.
  - **dscp** - Differentiated services code point provides the quality of service
-

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control. The various options available are:

- **0-63** - Differentiated services code point value
- **priority** - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules. Higher value of 'filter priority' implies a higher priority.  
 This parameter is not supported in some models due to hardware limitations.

---

<b>Mode</b>	ACL Extended Access List Configuration Mode
<b>Defaults</b>	<ul style="list-style-type: none"><li>• <code>dscp - -1</code></li><li>• <code>priority - 1</code></li><li>• <code>precedence - 1</code></li></ul>
<b>Example</b>	<code>Your Product (config-ext-nacl)# permit udp any 100.0.0.10 load-balance src-ip</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip access-list</code> - Creates IP ACLs and enters the IP Access-list configuration mode</li><li>• <code>deny udp</code> - Specifies the UDP packets to be rejected based on the associated parameters</li><li>• <code>show access-lists</code> - Displays the access list configuration</li></ul>

---

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## 27.16 deny udp

---

**Command Objective** This command specifies the UDP packets to be rejected based on the associated parameters.

---

**Syntax**

```
deny udp { any | host <src-ip-address> | <src-ip-address>
<src-mask> } [ { gt <port-number (1-65535)> | lt <port-number
(1-65535)> | eq <port-number (1-65535)> | range <port-
number (1-65535)> <port-number (1-65535)> } ] [ { any | host
<dest-ip-address> | <dest-ip-address> <dest-mask> } ] [ { gt
<port-number (1-65535)> | lt <port-number (1-65535)> | eq
<port-number (1-65535)> | range <port-number (1-65535)>
<port-number (1-65535)> } ] [ { tos { max-reliability | max-
throughput | min-delay | normal | <tos-value (0-7)> } | dscp
{ <value (0-63)> } ] [ priority <(1-255)> ]
```

---

**Parameter Description**

- **udp** - User Datagram Protocol
  - **any | host <src-ip-address> | <src-ip-address> <src-mask>** - Source IP address can be
    - 'any' or
    - the word 'host' and the dotted decimal address or
    - number of the network or the host that the packet is from and the network mask to use with the source address
  - **port-number** - Port Number. The input for the source and the destination port-number is prefixed with one of the following operators.
    - eq=equal
    - lt=less than
    - gt=greater than
    - range=a range of ports; two different port numbers must be specified
  - **any | host <dest-ip-address> | <dest-ip-address> <dest-mask>** - Destination IP address can be
    - 'any' or
    - the word 'host' and the dotted decimal address or
    - number of the network or the host that the packet is destined for and the network mask to use with the destination address
  - **tos** - Type of service. Can be max-reliability, max throughput, min-delay, normal or a range of values from 0 to 7, Differentiated Services Code Point (DSCP) values to match against incoming packets.
  - **dscp** - Differentiated services code point provides the quality of service control. The various options available are:
-




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---

– **0-63** - Differentiated services code point value

- **priority** - The priority of the filter used to decide which filter rule is applicable when the packet matches with more than one filter rules. Higher value of 'filter priority' implies a higher priority.

 This parameter is not supported in some models due to hardware limitations.

---

<b>Mode</b>	ACL Extended Access List Configuration Mode
<b>Defaults</b>	<ul style="list-style-type: none"><li>• <code>dscp - -1</code></li><li>• <code>priority - 1</code></li><li>• <code>precedence - 1</code></li></ul>
<b>Example</b>	<code>Your Product (config-ext-nacl)# deny udp host 10.0.0.1 any eq 20</code>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <code>ip access-list</code> - Creates IP ACLs and enters the IP Access-list configuration mode</li><li>• <code>permit udp</code> - Specifies the UDP packets to be forwarded based on the associated parameters</li><li>• <code>show access-lists</code> - Displays the access list configuration</li></ul>

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## 27.17 copy-to-cpu udp

<b>Command Objective</b>	This command copies the UDP control packets to control plane CPU with or without switching of packets based on the configured parameters.
<b>Syntax</b>	<pre>copy-to-cpu udp { any   host &lt;src-ip-address&gt;   &lt;src-ip-address&gt; &lt;src-mask&gt; } [{gt &lt;port-number (1-65535)&gt;   lt &lt;port-number (1-65535)&gt;   eq &lt;port-number (1-65535)&gt;   range &lt;port-number (1-65535)&gt; &lt;port-number (1-65535)&gt;}] { any   host &lt;dest-ip-address&gt;   &lt;dest-ip-address&gt; &lt;dest-mask&gt; } [{ gt &lt;port-number (1-65535)&gt;   lt &lt;port-number (1-65535)&gt;   eq &lt;port-number (1-65535)&gt;   range &lt;port-number (1-65535)&gt; &lt;port-number (1-65535)&gt;}] [{tos{max-reliability max-throughput min-delay normal &lt;tos-value(0-7)&gt;}]   dscp &lt;value (0-63)&gt;}] [ priority &lt;(1-255)&gt;] [noswitching]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>any   host &lt;src-ip-address&gt;   &lt;src-ip-address&gt; &lt;src-mask&gt;</b> - Copies the UDP control packets to control plane CPU with or without switching of packets based on the following source address configuration:<ul style="list-style-type: none"><li>– <b>any</b> - Copies all control packets. Does not check for the source IP address in the packets.</li><li>– <b>host</b> - Copies only the control packets having the specified unicast host network IP address as the source address.</li><li>– <b>&lt;src-ip-address&gt; &lt;src-mask&gt;</b> - Copies only the control packets having the specified unicast source IP address and mask.</li></ul></li><li>• <b>gt</b> - Copies only the UDP control packets having the UDP source / destination port numbers greater than the specified port number. This value ranges between 1 and 65535.</li><li>• <b>lt</b> - Copies only the UDP control packets having the UDP source / destination port numbers lesser than the specified port number. This value ranges between 1 and 65535.</li><li>• <b>eq</b> - Copies only the UDP control packets having the specified UDP source / destination port numbers. This value ranges between 1 and 65535.</li><li>• <b>range</b> - Copies only the UDP control packets having the UDP source / destination port numbers within the specified range. This value ranges between 1 and 65535. This value specifies the minimum port number and the maximum port number values.</li><li>• <b>any   host &lt;dest-ip-address&gt;   &lt;dest-ip-address&gt; &lt;dest-mask&gt;</b> - Copies the UDP control packets to control plane CPU with or without switching of packets based on the following destination address configuration:</li></ul>

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- **any** - Copies all control packets. Does not check for the destination IP address in the packets.
- **host** - Copies only the control packets having the specified host network IP address as the destination address.
- **<dest-ip-address> <dest-mask>** - Copies only the control packets having the specified destination IP address and mask.
- **ack | rst** - Copies the UDP control packets to control plane CPU with or without switching of packets based on the following configuration:
  - **ack** - Copies only the control packets having the ACK bit set.
  - **rst** - Copies only the control packets having the RST bit set.
- **tos** - Copies the UDP control packets to control plane CPU with or without switching of packets based on the following type of service configuration:
  - **max-reliability** - Copies only the control packets having TOS field set as high reliability.
  - **max-throughput** - Copies only the control packets having TOS field set as high throughput.
  - **min-delay** - Copies only the control packets having TOS field set as low delay.
  - **normal** - Copies all control packets. Does not check for the TOS field in the packets.
  - **<value (0-7)>** - Copies the control packets based on the TOS value set. The value ranges between 0 and 7. This value represents different combination of TOS.
    - **0** - Copies all control packets. Does not check for the TOS field in the packets.
    - **1** - Copies only the control packets having TOS field set as high reliability.
    - **2** - Copies only the control packets having TOS field set as high throughput.
    - **3** - Copies the control packets having TOS field set either as high reliability or high throughput.
    - **4** - Copies only the control packets having TOS field set as low delay.
    - **5** - Copies the control packets having TOS field set either as low delay or high reliability.
    - **6** - Copies the control packets having TOS field set either as low delay or high throughput.
    - **7** - Copies the control packets having TOS field set either as low delay or high reliability or high throughput.
- **dscp** - Copies only the UDP control packets having the specified DSCP value. This value ranges between 0 and 63.
- **priority** - Copies only the UDP control packets having the specified L2 priority value. This value ranges between 1 and 255.

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- **noswitching** - Copies the UDP control packets to control plane CPU without switching of packets.

 This parameter is not supported in some models due to hardware limitations.

---

**Mode** ACL Extended Access List Configuration Mode

**Defaults**

- any | host <src-ip-address> | <src-ip-address> <src-mask> - any
- gt - 0 (that is, the packets are not checked for UDP port number)
- lt - 0 (that is, the packets are not checked for UDP port number)
- eq - 0 (that is, the packets are not checked for UDP port number)
- range - 0 for minimum port number. 65535 for maximum port number.
- any | host <dest-ip-address> | <dest-ip-address> <dest-mask> - any
- dscp - -1 (that is, the packets are not checked for DSCP value)
- priority - 1



The UDP port number details can be set either for source or destination. The default value is applied for destination UDP port number, if the source UDP port number is configured or vice-versa.

---

**Example**

```
Your Product (config-ext-nacl)# copy-to-cpu udp any eq 300  
any tos 1 priority 2 noswitching
```

---

**Related Command(s)**

- **ip access-list** - Creates IP ACLs and enters the IP Access-list configuration mode
  - **show access-lists** - Displays the access lists configuration.
-

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## 27.18 permit icmp

---

**Command Objective** This command specifies the ICMP packets to be forwarded based on the IP address and the associated parameters.

---

**Syntax** `permit icmp {any | host <src-ip-address> | <src-ip-address> <mask>} {any | host <dest-ip-address> | <dest-ip-address> <mask>} [<message-type (0-255)>] [<message-code (0-255)>] [ priority <(1-255)>]`

---

**Parameter Description**

- **icmp** - Internet Control Message Protocol
- **any | host <src-ip-address> | <src-ip-address> <mask>** - Source IP address can be
  - 'any' or
  - the word 'host' and the dotted decimal address or
  - number of the network or the host that the packet is from and the network mask to use with the source address
- **any | host <dest-ip-address> | <dest-ip-address> <mask>** - Destination IP address can be
  - 'any' or
  - the word 'host' and the dotted decimal address or
  - number of the network or the host that the packet is destined for and the network mask to use with the destination address
- **message-type** - Message type

Value	ICMP type
0	Echo reply
3	Destination unreachable
4	Source quench
5	Redirect
8	Echo request
11	Time exceeded
12	Parameter problem
13	Timestamp request
14	Timestamp reply
15	Information request
16	Information reply
17	Address mask request
18	Address mask reply
155	No ICMP type


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---

- **message-code** - ICMP Message code

Value	ICMP code
0	Network unreachable
1	Host unreachable
2	Protocol unreachable
3	Port unreachable
4	Fragment need
5	Source route fail
6	Destination network unknown
7	Destination host unknown
8	Source host isolated
9	Destination network administratively prohibited
10	Destination host administratively prohibited
11	Network unreachable TOS
12	Host unreachable TOS
255	No ICMP code

- **priority** - The priority of the filter used to decide which filter rule is applicable when the packet matches with more than one filter rules. Higher value of 'filter priority' implies a higher priority.

 This parameter is not supported in some models due to hardware limitations.

---

**Mode** ACL Extended Access List Configuration Mode

---

**Defaults**

- message-type/message code - 255
- priority - 1

---

**Example** `Your Product (config-ext-nacl)# permit icmp any 10.0.0.1 load balance src-ip`

---

**Related Command(s)**

- **ip access-list** - Created IP ACLs and enters the IP Access-list configuration mode
- **deny icmp** - Specifies the ICMP packets to be rejected based on the IP address and associated parameters
- **show access-lists** - Displays the access list configuration

---

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---

## 27.19 deny icmp

---

**Command Objective** This command specifies the ICMP packets to be rejected based on the IP address and associated parameters.

---

**Syntax** `deny icmp {any | host <src-ip-address> | <src-ip-address> <mask>} {any | host <dest-ip-address> | <dest-ip-address> <mask>} [<message-type (0-255)>] [<message-code (0-255)>] [priority <(1-255)>]`

---

**Parameter Description**

- **icmp** - Internet Control Message Protocol
- **any | host<src-ip-address> | <src-ip-address> <mask>** - Source IP address can be
  - 'any' or
  - the word 'host' and the dotted decimal address or
  - number of the network or the host that the packet is from and the network mask to use with the source address
- **any | host <dest-ip-address> | <dest-ip-address> <mask>** - Destination IP address can be
  - 'any' or
  - the word 'host' and the dotted decimal address or
  - number of the network or the host that the packet is destined for and the network mask to use with the destination address

- **message-type** - Message type

Value	ICMP type
0	Echo reply
3	Destination unreachable
4	Source quench
5	Redirect
8	Echo request
11	Time exceeded
12	Parameter problem
13	Timestamp request
14	Timestamp reply
15	Information request
16	Information reply
17	Address mask request
18	Address mask reply
155	No ICMP type

---


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- **message-code** - ICMP Message code

Value	ICMP code
0	Network unreachable
1	Host unreachable
2	Protocol unreachable
3	Port unreachable
4	Fragment need
5	Source route fail
6	Destination network unknown
7	Destination host unknown
8	Source host isolated
9	Destination network administratively prohibited
10	Destination host administratively prohibited
11	Network unreachable TOS
12	Host unreachable TOS
255	No ICMP code

- **priority** - The priority of the filter used to decide which filter rule is applicable when the packet matches with more than one filter rules. Higher value of 'filter priority' implies a higher priority.

 This parameter is not supported in some models due to hardware limitations.

---

**Mode** ACL Extended Access List Configuration Mode

- Defaults**
- message-type / message code - 255
  - priority - 1

---

**Example** `Your Product (config-ext-nacl)# deny icmp host 100.0.0.10 10.0.0.1 255.255.255.255`

- Related Command(s)**
- **ip access-list** - Creates IP ACLs and enters the IP Access-list configuration mode
  - **permit icmp** - Specifies the ICMP packets to be forwarded based on the IP address and the associated parameters
  - **show access-lists** - Displays the access list configuration
-



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## 27.20 copy-to-cpu icmp

---

**Command Objective** This command copies the ICMP control packets to control plane CPU with or without switching of packets based on the configured parameters.

---

**Syntax** `copy-to-cpu icmp {any | host <src-ip-address> | <src-ip-address> <mask>} {any | host <dest-ip-address> | <dest-ip-address> <mask>} [<message-type (0-255)>] [<message-code (0-255)>] [priority <(1-255)>] [noswitching]`

---

**Parameter Description**

- `any | host <src-ip-address> | <src-ip-address> <mask>` - Copies the ICMP control packets to control plane CPU with or without switching of packets based on the following source address configuration:
  - `any` - Copies all control packets. Does not check for the source IP address in the packets.
  - `host` - Copies only the control packets having the specified unicast host network IP address as the source address.
  - `<src-ip-address> <mask>` - Copies only the control packets having the specified unicast source IP address and mask.
- `any | host <dest-ip-address> | <dest-ip-address> <mask>` - Copies the ICMP control packets to control plane CPU with or without switching of packets based on the following destination address configuration:
  - `any` - Copies all control packets. Does not check for the destination IP address in the packets.
  - `host` - Copies only the control packets having the specified host network IP address as the destination address.
  - `<dest-ip-address> <mask>` - Copies only the control packets having the specified destination IP address and mask.

- `<message-type (0-255)>` - Copies only the ICMP control packets having the specified message type. This value ranges between 0 and 255. The value can be one of the following:

Value	ICMP Type
0	Echo reply
3	Destination unreachable
4	Source quench
5	Redirect
8	Echo request
11	Time exceeded
12	Parameter problem
13	Timestamp request

---

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---


14	Timestamp reply
15	Information request
16	Information reply
17	Address mask request
18	Address mask reply

- **<message-code (0-255)>** - Copies only the ICMP control packets having the specified message code. This value ranges between 0 and 255. The value can be one of the following:

Value ICMP Code

0	Network unreachable
1	Host unreachable
2	Protocol unreachable
3	Port unreachable
4	Fragment need
5	Source route failed
6	Destination network unknown
7	Destination host unknown
8	Source host isolated
9	Destination network administratively prohibited
10	Destination host administratively prohibited
11	Network unreachable TOS
12	Host unreachable TOS
255	No ICMP codes to be filtered

- **priority <(1-255)>** - Copies only the ICMP control packets having the specified L2 priority value. This value ranges between 1 and 255.
- **noswitching** - Copies the UDP control packets to control plane CPU without switching of packets.

 This parameter is not supported in some models due to hardware limitations.

---

**Mode** ACL Extended Access List Configuration Mode

- Defaults**
- any | host <src-ip-address> | <src-ip-address> <mask> - any
  - any | host <dest-ip-address> | <dest-ip-address> <mask> - any
  - priority - 1

---


**Example** Your Product (config-ext-nacl)# copy-to-cpu icmp any any  
11 7 noswitching

- Related Command(s)**
- **ip access-list** - Creates IP ACLs and enters the IP Access-list configuration mode
  - **show access-lists** - Displays the access lists configuration.
-

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## 27.21 permit icmpv6


<b>Command Objective</b>	This command specifies the ICMPv6 packets to be forwarded based on the IP address and the associated parameters.
<b>Syntax</b>	<pre>permit icmpv6 {any   host &lt;src-ipv6-addr&gt; &lt;src-prefix-len (0-128)&gt;} {any   host &lt;dst-ipv6-addr&gt; &lt;dst-prefix-len (0-128)&gt;} [&lt;message-type (0-255)&gt;] [&lt;message-code (0-255)&gt;] [dscp &lt;value (0-63)&gt;] [flow-label &lt;value (0-1048575)&gt;] [priority &lt;value (1-7)&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>icmpv6</b> - Internet Control Message Protocol Version 6</li><li>• <b>any   host &lt;src-ipv6-addr&gt; &lt;src-prefix-len (0-128)&gt;</b>-</li><li>• <b>any   host &lt;dst-ipv6-addr&gt; &lt;dst-prefix-len (0-128)&gt;</b>-</li><li>• <b>message-type</b> - Message type, refer to RFC4443</li><li>• <b>message-code</b> - ICMPv6 Message code, refer to RFC4443</li><li>• <b>priority</b> - The priority of the filter used to decide which filter rule is applicable when the packet matches with more than one filter rules. Higher value of 'filter priority' implies a higher priority.  This parameter is not supported in some models due to hardware limitations.</li></ul>
<b>Mode</b>	ACL Extended Access List Configuration Mode
<b>Defaults</b>	<ul style="list-style-type: none"><li>• message-type/message code - 255</li><li>• priority - 1</li></ul>
<b>Example</b>	
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>show access-lists</b> - Displays the access lists configuration.</li></ul>

---

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## 27.22 deny icmpv6

<b>Command Objective</b>	This command specifies the ICMPv6 packets to be rejected based on the IP address and associated parameters.
<b>Syntax</b>	<pre>deny icmpv6 {any   host &lt;src-ipv6-addr&gt; &lt;src-prefix-len (0-128)&gt;} {any   host &lt;dst-ipv6-addr&gt; &lt;dst-prefix-len (0-128)&gt;} [&lt;message-type (0-255)&gt;] [&lt;message-code (0-255)&gt;] [dscp &lt;value (0-63)&gt;] [flow-label &lt;value (0-1048575)&gt;] [priority &lt;value (1-7)&gt;]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>icmpv6</b> - Internet Control Message Protocol Version 6</li><li>• <b>any   host &lt;src-ipv6-addr&gt; &lt;src-prefix-len (0-128)&gt;</b>-</li><li>• <b>any   host &lt;dst-ipv6-addr&gt; &lt;dst-prefix-len (0-128)&gt;</b>-</li><li>• <b>message-type</b> - Message type, refer to RFC4443</li><li>• <b>message-code</b> - ICMPv6 Message code, refer to RC4443</li><li>• <b>priority</b> - The priority of the filter used to decide which filter rule is applicable when the packet matches with more than one filter rules. Higher value of 'filter priority' implies a higher priority.  This parameter is not supported in some models due to hardware limitations.</li></ul>
<b>Mode</b>	ACL Extended Access List Configuration Mode
<b>Defaults</b>	<ul style="list-style-type: none"><li>• message-type / message code - 255</li><li>• priority - 1</li></ul>
<b>Example</b>	
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>show access-lists</b> - Displays the access lists configuration.</li></ul>

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## 27.23 copy-to-cpu icmpv6

---

**Command Objective** This command copies the ICMPv6 control packets to control plane CPU with or without switching of packets based on the configured parameters.

---

**Syntax** `copy-to-cpu icmpv6 {any | host <src-ipv6-addr> <src-prefix-len (0-128)>} {any | host <dst-ipv6-addr> <dst-prefix-len (0-128)>} [<message-type (0-255)>] [<message-code (0-255)>] [dscp <value (0-63)>] [flow-label <value (0-1048575)>] [priority <value (1-7)>] [noswitching]`

---

**Parameter Description** -

- **<message-type (0-255)>** - Copies only the ICMP control packets having the specified message type. This value ranges between 0 and 255. The value can be one of the following:

Value	ICMP Type
0	Reserved
1	Destination unreachable
3	Time Exceeded
4	Parameter Problem
128	Echo Request
129	Echo Reply
130	Multicast Listener Query
131	Multicast Listener Report
135	Neighbor Solicitation
136	Neighbor Advertisement
137	Redirect Message
139	ICMP Node Information Query
140	ICMP Node Information Response

- **<message-code (0-255)>** - Copies only the ICMP control packets having the specified message code. This value ranges between 0 and 255. The value can be one of the following:


Value	ICMP Code
0	No Route to Destination
1	Communication with Destination Administratively Prohibited
2	Beyond Scope of Source Address
3	Address Unreachable
4	Port Unreachable
5	Source Address Failed Ingress/Egress Policy
6	Reject Route to Destination

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255 Sequence Number Reset

- **priority** - Copies only the UDP control packets having the specified L2 priority value. This value ranges between 1 and 255.
- **noswitching** - Copies the UDP control packets to control plane CPU without switching of packets.
  -  This parameter is not supported in some models due to hardware limitations.

---

**Mode** ACL Extended Access List Configuration Mode

- 
- Defaults**
- message-type / message code - 255
  - priority - 1

---

**Example**

- 
- Related Command(s)**
- **show access-lists** - Displays the access lists configuration.
-

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## 27.24 ip access-group

---

**Command Objective** This command enables access control for the packets on the interface. It controls access to a Layer 2 or Layer 3 interface.

The no form of this command removes all access groups or the specified access group from the interface. The direction of filtering is specified using the token in or out.

---

**Syntax**

```
ip access-group <access-list-number (1-65535)> {in | out}

no ip access-group [<access-list-number (1-65535)>] {in | out}
```

---

**Parameter Description**

- **access-list-number** - IP access control list number
- **in** - Inbound packets
- **out** - Outbound packets

---

**Mode** Interface Configuration Mode



- IP access list must have been created.
- Following are the limitations for this command to be applicable to Layer 2 interfaces.
  - The out keyword is not supported by Layer 2 interfaces.
  - An IP ACL applied to a Layer 2 interface filters only the IP packets. MAC access-group interface configuration command with MAC extended ACLs must be used to filter non-IP packets.

---

**Example** Your Product (config-if)# ip access-group 1 in

---

**Related Command(s)**

- **ip access-list** - Creates IP ACLs and enters the IP Access-list configuration mode
- **show access-lists** - Displays the access list configuration

---

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## 27.25 mac access-group

---

**Command Objective** This command applies a MAC access control list (ACL) to a Layer 2 interface.

The no form of this command can be used to remove the MAC ACLs from the interface.

---

**Syntax** `mac access-group <access-list-number (1-65535)> in`

`no mac access-group [<access-list-number (1-65535)>] in`

---

**Parameter Description**

- `access-list-number` - Access List Number
- `in` - Inbound packets

---

**Mode** Interface Configuration Mode



MAC access list must have been created.

---

**Example** `Your Product (config-if)# mac access-group 5 in`

---

**Related Command(s)**

- `mac access-list extended` - Creates Layer 2 MAC ACLs, and returns the MAC-Access list configuration mode to the user
- `permit - MAC` - Specifies the packets to be forwarded based on the MAC address and the associated parameters
- `deny - MAC` - Specifies the packets to be rejected based on the MAC address and the associated parameters.
- `show access-lists` - Displays the access list statistics

---



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---

## 27.26 permit - MAC

---

**Command Objective** This command specifies the packets to be forwarded based on the MAC address and the associated parameters, that is, this command allows non-IP traffic to be forwarded if the conditions are matched.

---

**Syntax**

```
permit { any | host <src-mac-address> } { any | host <dest-mac-address> } [ aarp | amber | dec-spanning | decnet-iv | diagnostic | dsm | etype-6000 | etype-8042 | lat | lavc-sca | mop-console | mop-dump | msdos | mumps | netbios | vines-echo | vines-ip | xns-id | <protocol (0-65535)> | type <0-65535> <0-65535> | lsap <0-65535> <0-65535> ] [ encaps-type <value (1-65535)> ] [ Vlan <vlan-id (1-4094)> ] [ priority <value (1-255)> ]
```

---

**Parameter Description**

- **any | host <src-mac-address >** - Source MAC address to be matched with the packet
- **any | host <dest-mac-address >** - Destination MAC address to be matched with the packet
- **aarp** - Ethertype AppleTalk Address Resolution Protocol that maps a data-link address to a network address
- **amber** - EtherType DEC-Amber
- **dec-spanning** - EtherType Digital Equipment Corporation (DEC) spanning tree
- **decnet-iv** - EtherType DECnet Phase IV protocol
- **diagnostic** - EtherType DEC-Diagnostic
- **dsm** - EtherType DEC-DSM/DDP
- **etype-6000** - EtherType 0x6000
- **etype-8042** - EtherType 0x8042
- **lat** - EtherType DEC-LAT
- **lavc-sca** - EtherType DEC-LAVC-SCA
- **mop-console** - EtherType DEC-MOP Remote Console
- **mop-dump** - EtherType DEC-MOP Dump
- **msdos** - EtherType DEC-MSDOS

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- **mumps** - EtherType DEC-MUMPS
- **netbios** - EtherType DEC- Network Basic Input/Output System (NETBIOS)
- **vines-echo** - EtherType Virtual Integrated Network Service (VINES) Echo from Banyan Systems
- **vines-ip** - EtherType VINES IP
- **xns-id** - EtherType Xerox Network Systems (XNS) protocol suite
- **<protocol (0-65535)>** - Specifies the non-IP protocol type to be filtered. The value ranges between 0 and 65535. The value 0 represents that filter is applicable for all protocols.
- **type** - Specifies the ether type value and its mask. The value ranges between 0 and 65535 for type value and mask. The mask feature is currently not supported.
- **lsap** - Specifies the LSAP value and its mask. The value ranges between 0 and 65535 for type value and mask. The mask feature is currently not supported.
- **encaptype** - Encapsulation Type

---

<b>Mode</b>	ACL MAC Configuration Mode
-------------	----------------------------

- 
- |                 |   |
|-----------------|---|
| <b>Defaults</b> | <ul style="list-style-type: none"><li>• <b>&lt;protocol (0-65535)&gt;</b> - 0</li><li>• <b>sub-action</b> - none</li><li>• <b>vlan-id</b> - 0</li><li>• <b>priority</b> - 1</li><li>• <b>outerEtherType</b> - 0</li></ul> |
|-----------------|---|



- MAC access list must have been created.

---

<b>Example</b>	<pre>Your Product (config-ext-macl)# permit host 00:11:22:33:44:55 any load-balance src-ip vlan-action modify lan 526</pre>
----------------	---

- 
- |                           |   |
|---------------------------|---|
| <b>Related Command(s)</b> | <ul style="list-style-type: none"><li>• <b>mac access-list extended</b> - Creates Layer 2 MAC ACLs, and returns the MAC-Access list configuration mode to the user</li><li>• <b>user-defined access-list</b> - Creates the user defined access-list.</li><li>• <b>mac access-group</b> - Applies a MAC access control list (ACL) to a Layer 2 interface</li></ul> |
|---------------------------|---|

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- **deny - MAC** - Specifies the packets to be rejected based on the MAC address and the associated parameters
  - **show access-lists** - Displays the access list statistics
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## 27.27 deny - MAC

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<b>Command Objective</b>	This command specifies the packets to be rejected based on the MAC address and the associated parameters.
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<b>Syntax</b>	<pre>deny { any   host &lt;src-mac-address&gt; } { any   host &lt;dest-mac-address&gt; } [ aarp   amber   dec-spanning   decnet-iv   diagnostic   dsm   etype-6000   etype-8042   lat   lavc-sca   mop-console   mop-dump   msdos   mumps   netbios   vines-echo   vines-ip   xns-id   &lt;protocol (0-65535)&gt;   type &lt;0-65535&gt; &lt;0-65535&gt;   lsap &lt;0-65535&gt; &lt;0-65535&gt; ] [ encapsulate &lt;value (1-65535)&gt; ] [ Vlan &lt;vlan-id (1-4094)&gt; ] [ priority &lt;value (1-255)&gt; ]</pre>
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<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>any   host &lt;src-mac-address &gt;</b> - Source MAC address to be matched with the packet</li><li>• <b>any   host &lt;dest-mac-address &gt;</b> - Destination MAC address to be matched with the packet</li><li>• <b>aarp</b> - EtherType AppleTalk Address Resolution Protocol that maps a data-link address to a network address</li><li>• <b>amber</b> - EtherType DEC-Amber</li><li>• <b>dec-spanning</b> - EtherType Digital Equipment Corporation (DEC) spanning tree</li><li>• <b>decent-iv</b> - EtherType DECnet Phase IV protocol</li><li>• <b>diagnostic</b> - EtherType DEC-Diagnostic</li><li>• <b>dsm</b> - EtherType DEC-DSM/DDP</li><li>• <b>etype-6000</b> - EtherType 0x6000</li><li>• <b>etype-8042</b> - EtherType 0x8042</li><li>• <b>lat</b> - EtherType DEC-LAT</li><li>• <b>lavc-sca</b> - EtherType DEC-LAVC-SCA</li><li>• <b>mop-console</b> - EtherType DEC-MOP Remote Console</li><li>• <b>mop-dump</b> - EtherType DEC-MOP Dump</li><li>• <b>msdos</b> - EtherType DEC-MSDOS</li><li>• <b>mumps</b> - EtherType DEC-MUMPS</li></ul>
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- **netbios** - EtherType DEC- Network Basic Input/Output System (NETBIOS)
- **vines-echo** - EtherType Virtual Integrated Network Service (VINES) Echo from Banyan Systems
- **vines-ip** - EtherType VINES IP
- **xns-id** - EtherType Xerox Network Systems (XNS) protocol suite
- **<protocol (0-65535)>** - Specifies the non-IP protocol type to be filtered. The value ranges between 0 and 65535. The value 0 represents that filter is applicable for all protocols.
- **type** - Specifies the ether type value and its mask. The value ranges between 0 and 65535 for type value and mask. The mask feature is currently not supported.
- **lsap** - Specifies the LSAP value and its mask. The value ranges between 0 and 65535 for type value and mask. The mask feature is currently not supported.
- **encaptype** - Encapsulation Type
- **vlan** - VLAN ID to be filtered
- **priority** - The priority of the L2 filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules. Higher value of 'filter priority' implies a higher priority.
- **outerEtherType** - EtherType value to match on Service vlan tag

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**Mode** ACL MAC Configuration Mode

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- Defaults**
- **<protocol (0-65535)>** - 0
  - **vlan-id** - 0
  - **priority** - 1
  - **outerEtherType** - 0



- MAC access list must have been created.

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**Example** Your Product (config-ext-macl)# deny any host  
00:11:22:33:44:55 priority 200

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- Related Command(s)**
- **mac access-list extended** - Creates Layer 2 MAC ACLs, and returns the MAC-Access list configuration mode to the user
  - **user-defined access-list** - Creates the user defined access-list.

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- Related Command(s)**
- **mac access-group** - Applies a MAC access control list (ACL) to a Layer 2 interface
  - **permit - MAC** - Specifies the packets to be forwarded based on the MAC address and the associated parameters
  - **show access-lists** - Displays the access list statistics
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## 27.28 copy-to-cpu - MAC

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**Command Objective** This command copies the MAC protocol control packets to control plane CPU with or without switching of packets based on the configured parameters.

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**Syntax**

```
copy-to-cpu { any | host <src-mac-address> } { any | host <dest-mac-address> } [ aarp | amber | dec-spanning | decnet-iv | diagnostic | dsm | etype-6000 | etype-8042 | lat | lavc-sca | mop-console | mop-dump | msdos | mumps | netbios | vines-echo | vines-ip | xns-id | <protocol (0-65535)> | type <(0-65535)> <(0-65535)> | lsap <(0-65535)> <(0-65535)> ] [ encapsype <value (1-65535)> ] [ Vlan <vlan-id (1-4094)> ] [ priority <value (1-255)> ] [ noswitching ]
```

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**Parameter Description**

- **any | host <src-mac-address>** - Copies the MAC protocol control packets to control plane CPU with or without switching of packets based on the following source address configuration:
  - **any** - Copies all control packets. Does not check for the source MAC address in the packets.
  - **host** - Copies only the control packets having the specified source MAC address.
- **any | host <dest-mac-address>** - Copies the MAC protocol control packets to control plane CPU with or without switching of packets based on the following destination address configuration:
  - **any** - Copies all control packets. Does not check for the destination MAC address in the packets.
  - **host** - Copies only the control packets having the specified destination MAC address.
- **aarp** - Copies only the MAC protocol control packets having the protocol type as AARP.
- **amber** - Copies only the MAC protocol control packets having the protocol type as DEC-Amber.
- **dec-spanning** - Copies only the MAC protocol control packets having the protocol type as DEC spanning tree.
- **decnet-iv** - Copies only the MAC protocol control packets having the protocol type as DECnet Phase IV.
- **diagnostic** - Copies only the MAC protocol control packets having the protocol type as DEC-diagnostic.
- **dsm** - Copies only the MAC protocol control packets having the protocol type as DEC-DSM / DDP.

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- **etype-6000** - Copies only the MAC protocol control packets having the protocol type as EtherType 0x6000.
- **etype-8042** - Copies only the MAC protocol control packets having the protocol type as EtherType 0x8042.
- **lat** - Copies only the MAC protocol control packets having the protocol type as DEC-LAT.
- **lavc-sca** - Copies only the MAC protocol control packets having the protocol type as DEC-LAVC-SCA.
- **mop-console** - Copies only the MAC protocol control packets having the protocol type as DEC-MOP remote console.
- **mop-dump** - Copies only the MAC protocol control packets having the protocol type as DEC-MOP Dump.
- **msdos** - Copies only the MAC protocol control packets having the protocol type as DEC-MSDOS.
- **mumps** - Copies only the MAC protocol control packets having the protocol type as DEC-MUMPS.
- **netbios** - Copies only the MAC protocol control packets having the protocol type as NETBIOS.
- **vines-echo** - Copies only the MAC protocol control packets having the protocol type as VINES Echo.
- **vines-ip** - Copies only the MAC protocol control packets having the protocol type as VINES IP.
- **xns-id** - Copies only the MAC protocol control packets having the protocol type as XNS protocol suite.
- **<protocol (0-65535)>** - Copies only the MAC protocol control packets having the specified non-IP protocol type value. This value ranges between 0 and 65535.
- **type** - Copies only the MAC protocol control packets having the specified ether type value and mask. The value ranges between 0 and 65535 for type value and mask. The mask feature is currently not supported.
- **lsap** - Copies only the MAC protocol control packets having the specified LSAP value and mask. The value ranges between 0 and 65535 for type value and mask. The mask feature is currently not supported.
- **encaptype** - Copies only the MAC protocol control packets having the specified Ether Type value. This value ranges between 1 and 65535.
- **Vlan** - Copies only the MAC protocol control packets having the specified VLAN ID. This value ranges between 1 and 4094.



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- **priority** - Copies only the MAC protocol control packets having the specified L2 priority value. This value ranges between 1 and 255.
- **noswitching** - Copies the MAC protocol control packets to control plane CPU without switching of packets.  
 This parameter is not supported in some models.

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**Mode** ACL MAC Configuration Mode

- Defaults**
- any | host <src-mac-address> - any
  - any | host <dest-mac-address> - any
  - <protocol (0-65535)> - 0
  - encapsytype - 0 (that is, the packets are not checked for Ether Type)
  - Vlan - 0 (that is, the packets are not checked for VLAN ID)
  - priority - 1
  - outerEtherType - 0 (that is, the packets are not checked for outer Ether type)

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**Example** Your Product (config-ext-macl)# copy-to-cpu any any aarp encapsytype 10

- Related Command(s)**
- **mac access-list extended** - Creates Layer 2 MAC ACLs, and returns the MAC-Access list configuration mode to the user
  - **show access-lists** - Displays the access list statistics
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## 27.29 show access-lists

<b>Command Objective</b>	This command displays the access lists configuration.
<b>Syntax</b>	<code>show access-lists [{ip   mac}] &lt;access-list-number (1-65535)&gt; ]</code>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <code>ip</code> - IP Access List</li><li>• <code>mac</code> - MAC Access List</li></ul>
<b>Mode</b>	Privileged/User EXEC Mode
<b>Example</b>	<pre>Your Product# show access-lists EIP ACCESS LISTS ----- Standard IP Access List 34 ----- IP address Type                : IPV4 Source IP address              : 172.30.3.134 Source IP address mask        : 255.255.255.255 Source IP Prefix Length       : 32 Destination IP address        : 0.0.0.0 Destination IP address mask   : 0.0.0.0 Destination IP Prefix Length  : 0 Flow Identifier                : 0 In Port List                   : NIL Out Port List                      : NIL Filter Action                         : Deny Status                                : InActive Extended IP Access List 1002 ----- Filter Priority                 : 1 Filter Protocol Type           : ANY IP address Type                : IPV4 Source IP address              : 0.0.0.0 Source IP address mask        : 0.0.0.0</pre>

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```
Source IP Prefix Length      : 0
Destination IP address      : 0.0.0.0
Destination IP address mask : 0.0.0.0
Destination IP Prefix Length : 0
Flow Identifier              : 0
In Port List                 : NIL
Out Port List                 : NIL
Filter TOS                   : Invalid combination
Filter DSCP                  : NIL
Filter Action                : Permit
Status                       : InActive
Extended IP Access List 1002
```

```
-----
Filter Priority              : 1
Filter Protocol Type        : ANY
IP address Type             : IPV4
Source IP address           : 0.0.0.0
Source IP address mask      : 0.0.0.0
Source IP Prefix Length     : 0
Destination IP address      : 0.0.0.0
Destination IP address mask : 0.0.0.0
Destination IP Prefix Length : 0
Flow Identifier              : 0
In Port List                 : NIL
Out Port List                 : NIL
Filter TOS                   : Invalid combination
Filter DSCP                  : NIL
Filter Action                : Permit
Status                       : InActive
```

## MAC ACCESS LISTS

```
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No MAC Access Lists have been configured
```

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### Related Command(s)

- **ip access-list** - Creates IP ACLs and enters the IP Access-list configuration mode

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- **mac access-list extended** - Creates Layer 2 MAC ACLs, and returns the MAC-Access list configuration mode to the user
  - **permit - standard mode** - Specifies the packets to be forwarded depending upon the associated parameters
  - **deny - standard mode** - Denies traffic if the conditions defined in the deny statement are matched
  - **permit- ip/ospf/pim/protocol type** - Allows traffic for a particular protocol packet if the conditions defined in the permit statement are matched
  - **deny - ip/ospf/pim/protocol type** - Denies traffic for a particular protocol packet if the conditions defined in the deny statement are matched
  - **permit tcp** - Specifies the TCP packets to be forwarded based on the associated parameters
  - **deny tcp** - Specifies the TCP packets to be rejected based on the associated parameters
  - **permit udp** - Specifies the UDP packets to be forwarded based on the associated parameters
  - **deny udp** - Specifies the UDP packets to be rejected based on the associated parameters
  - **permit icmp** - Specifies the ICMP packets to be forwarded based on the IP address and the associated parameters
  - **deny icmp** - Specifies the ICMP packets to be rejected based on the IP address and associated parameters
  - **ip access-group** - Enables access control for the packets on the interface
  - **mac access-group** - Applies a MAC access control list (ACL) to a Layer 2 interface
  - **permit** - Specifies the packets to be forwarded based on the MAC address and the associated parameters
  - **deny** - specifies the packets to be rejected based on the MAC address and the associated parameters
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## 27.30 storm-control

<b>Command Objective</b>	<p>This command sets the storm control rate for broadcast, multicast and DLF packets.</p> <p>The no form of the command sets storm control rate for broadcast, multicast and DLF packets to the default value.</p>
<b>Syntax</b>	<pre>storm-control { broadcast   multicast   dlf } level &lt;rate-value&gt;</pre> <pre>no storm-control { broadcast   multicast   dlf } level</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>broadcast</b> - Broadcast packets</li><li>• <b>multicast</b> - Multicast packets</li><li>• <b>dlf</b> - Unicast packets</li><li>• <b>level</b> - Storm-control suppression level as a total number of packets per second.</li></ul>
<b>Mode</b>	Interface Configuration Mode
<b>Defaults</b>	Broadcast, multicast, and dlf storm control are disabled.
<b>Example</b>	<pre>Your Product(config-if)# storm-control broadcast level 1000</pre>
	<ul style="list-style-type: none"><li>• The rate must be specified in terms of packets per second</li><li>• Storm control is supported only on physical interfaces</li></ul>
<b>Related Command(s)</b>	<ul style="list-style-type: none"><li>• <b>show interfaces</b> - Displays the interface status and configuration</li></ul>

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## 27.31 rate-limit-output

<b>Command Objective</b>	<p>This command enables the rate limiting and burst size rate limiting by configuring the egress packet rate of an interface.</p> <p>The no form of the command disables the rate limiting and burst size rate limiting on an egress port.</p>
<b>Syntax</b>	<pre>rate-limit output [&lt;rate-value&gt;] [&lt;burst-value&gt;] no rate-limit output [rate-limit] [burst-limit]</pre>
<b>Parameter Description</b>	<ul style="list-style-type: none"><li>• <b>rate-value</b> - Line rate in kbps</li><li>• <b>burst-value</b> - Burst size value in kbps</li></ul>
<b>Mode</b>	Interface Configuration Mode
<b>Defaults</b>	<ul style="list-style-type: none"><li>• rate-value - 0</li><li>• burst-value - 0</li></ul>
<b>Example</b>	<pre>Your Product(config-if)# rate-limit output 64 32</pre>