Interface Masters
TECHNOLOGIES
Innovative Network Solutions

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Chapter 28

VLAN

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 list of CLI commands for the configuration of VLAN are 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 global configuration mode is,

```
iss(config-switch)# set vlan enable
```

The prompt for the VLAN configuration mode is,

```
iss(config-switch-vlan)# ports gigabitethernet 0/1 untagged
gigabitethernet 0/1 forbidden gigabitethernet 0/2 name vl1
```

All the existing commands in VLAN configuration mode are also used for the configuration of a B-VLAN of a PBB.

☞ The parameters specific to MI are stated so, against the respective parameter descriptions in this document.

The output of the **show** commands differ for SI and MI. Hence both the output are documented while depicting the show command examples.

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

- shutdown vlan
- set vlan
- vlan
- set mac-learning
- base bridge-mode
- mac-vlan
- subnet-vlan
- protocol-vlan
- map protocol
- vlan learning mode
- fid
- set vlan traffic-classes
- mac-address-table static unicast
- 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
- vlan default hybrid type
- wildcard
- unicast-mac learning limit
- map subnet
- ports
- vlan active
- set unicast-mac learning
- interface range
- vlan unicast-mac learning limit
- forward-all
- forward-unregistered
- switchport pvid

- switchport access vlan
- switchport acceptable-frame-type
- switchport ingress-filter
- port mac-vlan
- port subnet – vlan
- port 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 fid
- show forward-all
- show forward-unregistered
- show vlan traffic-classes
- show vlan port config
- show vlan protocols-group
- show protocol-vlan
- show mac-vlan
- show subnet vlan mapping
- show vlan counters
- 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
- multicast-mac limit
- dot1x-tunnel-address
- lacp-tunnel-address
- stp-tunnel-address
- gvrp-tunnel-address
- gmrp-tunnel-address
- bridge-mode
- l2protocol-tunnel cos
- clear l2protocol-tunnel counters
- switchport dot1q customer vlan
- switchport dot1q customer vlan – Status
- switchport customer-vlan
- switchport service vlan
- switchport service vlan classify
- switchport unicast-mac learning
- switchport unicast-mac learning limit
- switchport dot1q
- set switchport ether-type swap

- set switchport [service] vlan swap
- switchport [service] vlan mapping
- l2protocol-tunnel
- l2protocol-peer
- l2protocol-discard
- service-vlan
- service-vlan acceptable-frame-type
- service-vlan ingress-filter
- service-vlan def-user-priority
- service-vlan recv-priority
- service-vlan cos-preservation
- switchport [provider-bridge] require-drop-encoding
- switchport [provider-bridge] pcp-selection-row
- switchport [provider-bridge] use-dei
- switchport mode dot1q-tunnel
- service-type {e-line | e-lan}
- show service vlan
- show [service] vlan mapping
- show ethertype mapping
- show [provider-bridge] port config
- show multicast-mac limit
- show l2protocol tunnel-mac-address
- show provider-bridge pep configuration
- show [provider-bridge] pcp encoding
- show [provider-bridge] pcp decoding
- show provider-bridge priority regen
- show dot1q-tunnel
- show l2protocol-tunnel
- show l2protocol-discard statistics

Few VLAN commands are retained for backward compatibility. Table 28-1 lists the backward compatible commands and maps them to the commands which have the same functionality.

Table 28-1: Commands Retained for Backward Compatibility

Commands for Backward Compatibility	Commands with Similar functionality[1]
provider-bridge dot1x-tunnel-address	dot1x-tunnel-address
provider-bridge lacp-tunnel-address	lacp-tunnel-address
provider-bridge stp-tunnel-address	stp-tunnel-address
provider-bridge gmrp-tunnel-address	gmrp-tunnel-address
provider-bridge gvrp-tunnel-address	gvrp-tunnel-address

28.1 shutdown vlan

[1] These commands are described in this document.

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.

shutdown vlan

no shutdown vlan

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults VLAN switching feature is started and enabled in the switch.

Example

```
iss(config)# shutdown vlan
```

- 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.
- This command is available, only if the switch NPAPI_WANTED is set as no during the compilation of the exe.

Related Commands

- **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 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.
- **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.
- **vlan learning mode** - Sets the VLAN learning mode to be applied for all

ports of the switch.

- **fid** - Configures a VLAN or a list of VLANs to use a filtering database for making forwarding decisions.
- **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 mac-vlan** - Enables MAC-based VLAN membership classification in a port.
- **port subnet – vlan** - Enables subnet based VLAN membership classification in a 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.
- **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 fid** - Displays the FID VLAN mapping information of all FIDs in the switch / all contexts.
- **show forward-all** - Displays all entries in the VLAN forward all table.
- **show forward-unregistered** - Displays all entries in the VLAN forward unregistered table.
- **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 counters** - Displays the VLAN traffic statistics details for all VLANs (for which the member port details are configured) available in the switch / all contexts.
- **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.
- **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.

28.2 set vlan

This command globally enables / disables VLAN feature in the switch. The VLAN feature allows you to logically segment a shared media LAN for forming virtual workgroups.

```
set vlan { enable | disable }
```

Syntax Description

enable	-	Enables VLAN feature on all ports of the switch.
disable	-	Disables VLAN feature on all ports of the switch.

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults enable

Example

```
iss(config)# set vlan disable
```

☞

- The VLAN feature can be disabled on all ports of the switch, only if GVRP and GMRP features are disabled on all ports of the switch.
- The VLAN feature cannot be configured in the switch, if the base bridge mode is set as transparent bridging.
- VLAN feature can be enabled / disabled in the switch, only if the VLAN switching feature is started and enabled in the switch.
- This command is available, only if the switch NPAPI_WANTED is set as no during the compilation of the exe.

Related Commands

- **base bridge-mode dot1q-vlan** - Configures the VLAN operation mode as VLAN aware bridging.
- **set gmrp disable** – Globally disables GMRP feature on all ports of a switch.
- **set gvrp disable** – Globally disables GVRP feature on all ports of a switch.
- **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

28.3 vlan

This command creates a VLAN in the ISS 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, if the VLAN is already created. The created VLAN is identified using a unique VLAN ID whose value ranges from 1 to 4094. In PBB bridge mode, this command is used to create customer, service and backbone VLANs.

The no form of the command deletes the existing VLAN and its corresponding configurations from the ISS.

```
vlan <vlan-id(1-4094)>
```

```
no vlan <vlan-id(1-4094)>
```

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults VLAN 1 is already created and exists in the ISS.

Example

```
iss(config)# vlan 4
```

- The VLAN 1 interface created by default cannot be deleted using the no form of the command.
- Only the default VLAN can be configured and 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.

Related Command

- **`base bridge-mode`** - Configures the mode in which the VLAN feature should operate on the switch.
- **`no shutdown vlan`** - Starts and enables VLAN switching feature in the switch.

28.4 set mac-learning

This command configures the global mac learning status.

```
set mac-learning { enable | disable }
```

Syntax Description	**enable**	-	Enables the global mac learning status
	disable	-	Disables the global mac learning status

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults enable

Example

```
iss(config)# set mac-learning enable
```

28.5 base bridge-mode

This command configures the mode in which the VLAN feature should operate on the switch. This configuration is globally applied on all ports of the switch.

```
base bridge-mode { dot1d-bridge | dot1q-vlan }
```

Syntax Description

dot1d-bridge	-	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: • GARP, IGS, MLDS, PNAC, LA, and LLDP are shutdown. • Spanning tree mode is set as RSTP or spanning tree is shutdown. • All logical interfaces such as loopback, are deleted. The default L3 VLAN interface is also deleted.
dot1q-vlan	-	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.

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults dot1q-vlan (VLAN aware bridging)

Example

```
iss(config)# base bridge-mode dot1d-bridge
```

☞
- The VLAN mode can be configured, only if the VLAN switching feature is started and enabled in the switch.
- This command is available, only if the switches ISS_METRO_WANTED and MBSM_WANTED are set as no during the compilation of the exe.

Related
- **shutdown garp** - Shuts down the GARP module in the switch on all ports and

Commands releases all memories used for the GARP module..

- **shutdown snooping** - Shuts down snooping in the switch.
- **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.
- **shutdown dot1x** - Shuts down dot1x feature.
- **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.
- **vlan learning mode** - Configures the VLAN learning mode to be applied for all ports of the 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.
- **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.
- **set unicast-mac learning** - Enables or disables unicast-MAC learning feature for a VLAN.
- **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.

28.6 mac-vlan

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

The VLAN membership should be assigned initially, if the MAC-based VLAN membership classification is to be enabled in the switch.

mac-vlan

no mac-vlan

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

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

Example

```
iss(config)# mac-vlan
```

- 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.
- This command is available, only if either the switch NPAPI_WANTED is set as no or the switch XCAT is set as yes during the compilation of the exe.

Related Commands

- **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.
- **port mac-vlan** - Enables MAC-based VLAN membership classification in 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.
- **show mac-vlan** - Displays all entries in the MAC map table.

28.7 subnet-vlan

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.

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

subnet-vlan

no subnet-vlan

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults Subnet-based VLAN membership classification is disabled on all ports of the switch.

Example
```
iss(config)# subnet-vlan
```

☞ 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.

Related Commands

- **base bridge-mode dot1q-vlan** - Configures the VLAN operation mode as VLAN aware bridging.
- **map subnet** - Configures VLAN-IP subnet address mapping that is used only for subnet-VLAN based membership classification.
- **port subnet – vlan** - Enables subnet based VLAN membership classification in 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.
- **show subnet-vlan mapping** - Displays all entries in the subnet map table.

28.8 protocol-vlan

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.

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

protocol-vlan

no protocol-vlan

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults Protocol-based VLAN membership classification is enabled on all ports of the switch.

Example

```
iss(config)# no protocol-vlan
```

☞ 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.

Related Commands

- **base bridge-mode dot1q-vlan** - Configures the VLAN operation mode as VLAN aware bridging.
- **port protocol-vlan** - Enables protocol-VLAN based membership classification in 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

28.9 map protocol

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

The no form of the command deletes all group that have the specified 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.

```
map protocol {ip | novell | netbios | appletalk | other <aa:aa or
aa: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:aa>} {enet-v2 | snap | llcOther | snap8021H | snapOther}
```

Syntax Description

`ip`	-	Configures the protocol as IP, which is used for communicating data across network using TCP / IP. The corresponding octet string is 08:00.
`novell`	-	Configures the protocol as Novell Netware protocol suite, which is developed by Novell Inc. The corresponding octet string is ff:ff.
`netbios`	-	Configures 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`	-	Configures the protocol as AppleTalk, which is a proprietary suite of protocols developed by Apple Inc. The corresponding octet string is 80:9b.
`other`	-	Configures 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:

1. Preamble – 7 byte value that allows the Ethernet card to synchronize with the beginning of a frame.
2. SFD – 1 byte value that indicates the start of a frame.
3. Destination – 6 byte MAC address of the destination.
4. Source – 6 byte MAC address of the source or a broadcast.
5. Length – 2 byte value representing the number of bytes in the data fields.
6. Data – 46 to 1500 bytes higher layer information containing protocol information or user data.
7. 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:

1. OUI – 3 byte value representing organizational unique ID assigned to vendors for differentiating protocols from different manufacturers.
2. 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:

1. DSAP – 1 byte value representing destination service access point to determine the protocol used for the upper layer.
2. SSAP – 1 byte value representing source service access point to determine the protocol used for the upper layer.
3. 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:

1. 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. 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 ether 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.

protocols-group - 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 from 0 to 2147483647.

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Example

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

☞ 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.

Related Command

- **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.

28.10 vlan learning mode

This command configures the VLAN learning mode to be applied for all ports of the switch. This mode defines the forwarding database modes of operation to be implemented by the switch.

```
vlan learning mode {ivl | svl | hybrid}
```

Syntax Description

ivl	-	Sets the VLAN learning mode as IVL. Separate forwarding database is created for each VLAN. The information learnt from a VLAN is not shared among other relative VLANs during forwarding decisions. This mode is suitable in situations where the database size is not a constraint and end stations operate over multiple VLANs with the same MAC address.
svl	-	Sets the VLAN learning mode as SVL. Single forwarding database is created for all VLANs. The information learnt from a VLAN is shared among all other relative VLANs during forwarding decision. This mode is suitable in situations where the learning database size is a constraint.
hybrid	-	Sets the VLAN learning mode as hybrid. Same forwarding database is created for some VLANs and separate forwarding database is used for some VLANs. The usage of same or separate forwarding database for the VLAN is decided based on the static unicast MAC address in the FDB table entries.

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults ivl

Example

```
iss(config)# vlan learning mode svl
```

☞

- The VLAN learning mode 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 available, only if the switch NPAPI_WANTED is set as no during the compilation of the exe.

Related Commands

- **`base bridge-mode dot1q-vlan`** - Configures the VLAN operation mode as VLAN aware bridging.
- **`fid`** - Configures a VLAN or a list of VLANs to use a filtering database for making forwarding decisions.
- **`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.
- **`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 that is applicable to all VLANs created in the switch / all contexts.

28.11 fid

This command configures a VLAN or a list of VLANs to use a filtering database for making forwarding decisions.

The no form of the command unmaps the specified VLANs from the FIDs except the default VLAN list. The default VLAN list is always mapped with the FID.

The filtering database is identified using a filtering database identifier. If the VLANs are mapped to the same FID, then those mapped VLANs operate in SVL mode. If the VLANs are mapped to unique FID, then those mapped VLANs operate in IVL mode.

```
fid <integer(1-4094)> vlan <vlan-range>
```

```
no fid vlan <vlan-range>
```

Syntax Description	**<integer(1-4094)>**	-	Configures the FID that should be mapped with the specified VLAN or list of VLANs. This value ranges from 1 to 4094.
	vlan	-	Configures a VLAN ID or list of VLAN IDs that should be mapped with the specified FID. 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.

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults All VLANs are mapped to FID having value equal to the ID of those VLANs, if default hybrid learning type is set as **ivl**. That is, vlan 1 is mapped to FID 1, vlan 2 is mapped to FID 2 and so on.

All VLANs are mapped to filtering database ID 1, if default hybrid learning type is set as **svl**. That is, VLANs 1 to 4094 are mapped to FID 1 and no VLANs are mapped for other FIDs.

Example

```
iss(config)# fid 2 vlan 2-20
```

- The VLAN IDs and FIDs can be mapped as per your requirements, only if the VLAN learning mode is set as hybrid.
- The VLANs mapped to FID 1 cannot be changed, once the default hybrid learning type is set as svl.
- The mapping of VLANIDs and FIDs can be configured in the switch, only if the VLAN switching feature is started and enabled in the switch.
- This command is available, only if the switch NPAPI_WANTED is set as no

during the compilation of the exe.

- The MST instance of all VLANs in the list should be the same.
- This command can be executed successful, only if VLAN with the same FID have MST instance same as that of the VLANs in the list.

Related Commands

- **`vlan learning mode hybrid`** - Sets the VLAN learning mode for the switch as hybrid.
- **`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.
- **`no shutdown vlan`** - Starts and enables VLAN switching feature in the switch.
- **`show fid`** - Displays the FID VLAN mapping information of all FIDs in the switch / all contexts.

28.12 set vlan traffic-classes

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.

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

Syntax 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

Package Workgroup, Enterprise and Metro

Defaults enable

Example

```
iss(config)# set vlan traffic-classes disable
```

☞ 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.

Related Commands

- **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.

28.13 mac-address-table static unicast

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.

```
mac-address-table static unicast <aa:aa:aa:aa:aa:aa> vlan <vlan-id(1-4094)>
[{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>])
[connection-identifier <ucast_mac>] [status { permanent | deleteOnReset |
deleteOnTimeout }]
```

```
no mac-address-table static unicast <aa:aa:aa:aa:aa:aa> vlan <vlan-id(1-4094)>
[{recv-port <ifXtype> <ifnum>}]
```

PBB feature enabled in the switch

```
mac-address-table static unicast <aa:aa:aa:aa:aa:aa> vlan <vlan-id(1-4094)>
[{recv-port <ifXtype> <ifnum> | service-instance <integer(256-16777214)>}]
interface ([<interface-type> <0/a-b,0/c,...>] [<interface-type> <0/a-
b,0/c,...>] [port-channel <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(1-4094)>
[{recv-port <ifXtype> <ifnum> | service-instance <integer(256-16777214)>}]
```

Syntax Description

`aa:aa:aa:aa:aa:aa`	-	Destination MAC address
`vlan`	-	VLAN Identifier
`recv-port`	-	Received port's Interface type and ID
`service-instance`	-	Service instance identifier. This value ranges between 256 and 16777214.
`interface`	-	Member Ports Interface type and ID.
`<interface-type> <0/a-b, 0/c, ...>`	-	Member Ports Interface type and ID.
`port-channel`	-	Port-channel ID
`connection-`	-	Associates backbone MAC address of peer backbone edge bridge with customer MAC address that can be

	identifier		reached through the bridge.
	status	-	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

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults status - permanent

Example

```
iss(config)# mac-address-table static unicast 00:11:22:33:44:55
vlan 3 recv-port gigabitethernet 0/2 interface gigabitethernet
0/1 status deleteOnTimeout

iss(config)# mac-address-table static unicast 00:11:22:33:44:55
vlan 3 service-instance 1005 interface gigabitethernet 0/1
status deleteOnTimeout
```

☞ VLAN/Service-instance must have been configured and member ports must have been configured for the specified VLAN/Service-instance.

Related Commands

- **show mac-address-table static unicast** - Displays the statically configured unicast address from the MAC address table.
- **mac-address-table static multicast** - Configures a static multicast 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.
- **Service instance** - Used to enter the service instance mode for performing ISID specific operations.

28.14 mac-address-table static unicast – Transparent Bridging Mode

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.

```
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>]
```

Syntax 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:

1. 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.
2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-

lan and 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:

1. 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.
2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and 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.

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.

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults status - permanent

Example

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

☞

- 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 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.

Related Commands

- **`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.

28.15 mac-address-table static multicast

This command configures a static multicast MAC address in the forwarding database.

```
mac-address-table static multicast <aa:aa:aa:aa:aa:aa> vlan <vlan-id(1-4094)>
[{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>]])
[forbidden-ports ([<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> vlan <vlan-id(1-
4094)> [recv-port <ifXtype> <ifnum>}]
```

PBB feature enabled in the switch

```
mac-address-table static multicast <aa:aa:aa:aa:aa:aa> vlan <vlan-id(1-4094)>
[{recv-port <ifXtype> <ifnum> | service-instance <integer(256-16777214)>}]
interface ([<interface-type> <0/a-b,0/c,...>] [<interface-type> <0/a-
b,0/c,...>] [port-channel <a,b,c-d>]]) [forbidden-ports ([<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> vlan <vlan-id(1-
4094)> [{recv-port <ifXtype> <ifnum> | service-instance <integer(256-
16777214)>}]
```

Syntax Description

`aa:aa:aa:aa:aa:aa`	-	Multicast MAC address
`vlan`	-	VLAN Identifier
`recv-port`	-	Received port's Interface type and ID
`service-instance`	-	Service instance identifier. This value ranges between 256 and 16777214.
`interface`	-	Member Ports Interface type and ID.
`<interface-type> <0/a-b, 0/c, ...>`	-	Member Ports Interface type and ID.
`port-channel`	-	Port channel ID

	forbidden-ports	-	Forbidden ports interface type and ID.
	<interface-type> <0/a-b, 0/c, ...>	-	Forbidden ports interface type and ID.
	port-channel	-	Port-channel ID
	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

Package Workgroup, Enterprise and Metro

Defaults status - permanent

Example

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

☞ VLAN/Service-instance must have been configured and member ports must have been configured for the specified VLAN/Service-instance.

Related Command

- **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.
- **service instance** – Used to enter the service instance mode for performing ISID specific operations.

28.16 mac address-table static mcast

This command configures a static multicast MAC (Media Access Control) address in the forwarding database and the no form of the command deletes a configured static multicast MAC address from the forwarding database.

This command operates similar to that of the command mac-address-table static multicast.

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>]

Syntax Description

mcast_mac	-	Multicast MAC address.
vlan	-	VLAN identifier. This value ranges between 1 and 4094.
interface	-	Member Ports Interface type and ID.
<interface-type> <0/a-b, 0/c, ...>	-	Specifies interface type and ID of the member and forbidden ports.
port-channel	-	Port-channel ID

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Example

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

VLAN/Service-instance must have been configured and member ports must have been configured for the specified VLAN/Service-instance.

Related Command

- **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.
- **service instance** – Used to enter the service instance mode for performing ISID specific operations.

28.17 mac-address-table static multicast – Transparent Bridging mode

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.

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

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

```
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>]
```

Syntax 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:

1. 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.
2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and 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:

1. 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.
2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and 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.

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.

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults status - permanent

Example

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

- 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 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.

Related Command

- **`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.

28.18 mac-address-table aging-time

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.

This timeout period value ranges from 10 to 1000000 seconds, if the switch DX260 is set as no during compilation of the exe. The value ranges from 10 to 630 seconds, if the switch DX260 is set as yes during compilation of the exe.

You should provide high value for the aging time to record dynamic entries for a longer time, if traffic is not frequent. This reduces the possibility of flooding.

The no form of the command resets the maximum age of an entry in the MAC address table to its default value.

mac-address-table aging-time <10-630 seconds>

no mac-address-table aging-time

If switch DX260 is set as no during compilation of the exe:

mac-address-table aging-time <10-1000000 seconds>

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults 300

Example

```
iss(config)# mac-address-table aging-time 200
```

- The aging timer is applied to the static entry in the MAC address table, only if static entry status is set as deleteOnTimeout.
- 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.

Related Command

- **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.

- **`show mac-address-table aging-time`** - Displays the ageing time configured for the MAC address table.

28.19 clear vlan statistics

This command 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. The statistics information contains number of unicast, broadcast and unknown unicast packets flooded.

```
clear vlan statistics [vlan < vlan-id (1-4094)>]
```

Syntax Description	**vlan**	-	Clears VLAN counters for the specified VLAN ID. This is a unique value that represents the specific VLAN created and activated. This value ranges from 1 to 4094.

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Example

```
iss(config)# clear vlan statistics vlan 1
```

☞ The information is the VLAN counters can be deleted, only if the VLAN switching feature is started and enabled in the switch.

Related Command

- **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
- **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.

28.20 vlan default hybrid type

This command configures the default hybrid learning mode for all VLANs when the operational learning mode of the switch is globally set as hybrid.

vlan default hybrid type {ivl | svl}

Syntax Description

ivl	-	Configures the default hybrid learning mode as IVL. All VLANs are mapped to FID having value equal to the ID of those VLANs. That is, vlan 1 is mapped to FID 1, vlan 2 is mapped to FID 2 and so on.
svl	-	Configures the default hybrid learning mode as SVL. All VLANs are mapped to filtering database ID 1. That is, VLANs 1 to 4094 are mapped to FID 1 and no VLANs are mapped for other FIDs.

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Example

```
iss(config)# vlan default hybrid type ivl
```

- The default VLAN hybrid learning mode can be configured, only if the VLAN learning mode is set as hybrid.
- VLAN's default hybrid learning type 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 available, only if the switch NPAPI_WANTED is set as no during the compilation of the exe.
- This configuration should be saved and restored on restart of the switch. This configuration should not be done while exe is running.

Related Commands

- **base bridge-mode dot1q-vlan** - Configures the VLAN operation mode as VLAN aware bridging.
- **vlan learning mode hybrid** - Sets the VLAN learning mode for the switch as hybrid.
- **fid** - Configures a VLAN or a list of VLANs to use a filtering database for making forwarding decisions.
- **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
- **show fid** - Displays the FID VLAN mapping information of all FIDs in the switch / all contexts and the default hybrid learning mode configured in the

switch / all contexts.

28.21 wildcard

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.

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

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

Syntax Description

mac-adddress	-	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: 1. 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. 2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second. 3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.

4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and 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.

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

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

☞ 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.

Related Commands

- **`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.

28.22 unicast-mac learning limit

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 from 0 to 4294967295. The maximum number of unicast MAC addresses that can be learnt differs for targets. They are:

- 950 for BCM and Marvell boards
- 16128 for xCAT board.

The upper limit value depends on the underlying hardware.

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

```
unicast-mac learning limit <limit value(0-4294967295)>
```

```
no unicast-mac learning limit
```

Mode Global Configuration mode

Package Workgroup, Enterprise and Metro

Defaults The maximum limit supported by the switch.

Example

```
iss(config)# unicast-mac learning limit 5
```

☞

- 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.

Related Command

- **`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 that is applicable to all VLANs created in the switch / all contexts.

28.23 map subnet

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

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

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.

```
map subnet <ip-subnet-address> vlan <vlan-id(1-4094)> [arp {suppress | allow}]
```

```
no map subnet <ip-subnet-address>
```

Syntax Description

`<ip-subnet-address>`	-	Configures the IP subnet address to be used for deciding on discarding / allowing of ARP frames.
`vlan`	-	Configures the VLAN ID to which the configured source IP subnet address should be mapped. This is a unique value that represents the specific VLAN created. This value ranges between 1 and 4094.
`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 specified source IP subnet address.

Mode Global Configuration Mode / Interface Configuration Mode

This command is available only in the Global Configuration mode, if the switch BCMX_WANTED is set as yes during the compilation of the exe.

This command is available only in the Interface Configuration mode, if the switch BCMX_WANTED is set as no during the compilation of the exe.

Package Workgroup, Enterprise and Metro

Default arp - Allow for all boards

suppress for Broadcom board

Example

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

☞
- 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.

- The ARP option cannot be configured as **allow**, when running on Broadcom target. Since BCM does not classify ARP broadcast packets based on subnet VLAN mapping. In case of BCM, subnet VLAN mapping works only on IP packets.

Related Commands

- **`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.

28.24 ports

This command statically configures a VLAN entry with the required member ports, untagged ports and forbidden ports.

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.

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

For ports in PBB bridge mode, this command is used to define member ports for a VLAN in a component.

- For BVLAN in a B component, only the PNP ports can be set as member ports.
- For SVLAN in an I component, only the CNP-S tagged ports can be set as member ports.
- For CVLAN in an I component, only the CNP-C tagged ports can be set as member ports.

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

Syntax Description

`[<interface-type> <0/a-b,0/c,...>] [<interface-type> <0/a-b,0/c,...>] [port-channel <a,b,c-d>]` - 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:

1. 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.
2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and 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.

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 - 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:

1. 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.
2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and 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.

- 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.

CBP should always be set as untagged member port of a BVLAN.

forbidden - 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:

1. 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.
2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and 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.
- 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 - Configures the unique name of the VLAN. This name is used to identify the VLAN and is an administratively assigned string whose maximum size is 32.

Mode Config-VLAN Mode

Package Workgroup, Enterprise and Metro

Defaults 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).

Example

```
iss(config-vlan)# ports gigabitethernet 0/1 untagged
gigabitethernet 0/1 forbidden gigabitethernet 0/2 name vl1
```

Related Command

- **ipv6 mld snooping mrouter** - Configures statically the router ports for a VLAN.
- **forward-all** - Configures the forward-all port details for a VLAN to specify the ports that forward or do not forward all multicast group-addressed frames.
- **forward-unregistered** - Configures the forward-unregistered port details for a VLAN to specify the ports that forward or do not forward multicast group-addresses frames for which no more specific forwarding information applies.
- **switchport mode** - Configures the mode of operation for a switch port.
- **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 counters** - Displays the VLAN traffic statistics details for all VLANs (for which the member port details are configured) available in the switch / all contexts.
- **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 count** - Displays the total number of static / dynamic unicast and multicast MAC address entries created in the FDB table.
- **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.

28.25 vlan active

This command activates a VLAN in the switch. The created VLANs should be active for further VLAN related configurations.

vlan active

Mode Config-VLAN Mode

Package Workgroup, Enterprise and Metro

Defaults The default VLAN (VLAN 1) is activated once the switch is started.

Example
```
iss(config-vlan)# vlan active
```

☞ VLAN cannot be made active, if the base bridge mode is set as transparent bridging.

Related Command

- **ipv6 mld snooping** – Enables MLD snooping in the switch for a VLAN.
- **ipv6 mld snooping version –** Sets the operating version of the MLD snooping switch for a specific VLAN
- **ipv6 mld snooping fast-leave** - Enables fast leave processing for a specific VLAN
- **ipv6 mld snooping querier –** Configures the MLD snooping switch as a querier for a specific VLAN
- **ipv6 mld snooping query-interval –** Sets the time period with which the general queries are sent by the MLD snooping switch when it is configured as a querier on the VLAN
- **ipv6 mld snooping mrouter** - Configures statically the router ports for a VLAN.
- **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 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.

- **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.
- **map subnet** - Configures VLAN-IP subnet address mapping that is used only for subnet-VLAN based membership classification.
- **set unicast-mac learning** - Enables or disables unicast-MAC learning feature for a VLAN.
- **vlan unicast-mac learning limit** - Configures the unicast-MAC learning limit for a VLAN.
- **forward-all** - Configures the forward-all port details for a VLAN to specify the ports that forward or do not forward all multicast group-addressed frames.
- **forward-unregistered** - Configures the forward-unregistered port details for a VLAN to specify the ports that forward or do not forward multicast group-addresses frames for which no more specific forwarding information applies.
- **switchport pvid** - Configures the PVID on the specified port.
- **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 forward-all** - Displays all entries in the VLAN forward all table.
- **show forward-unregistered** - Displays all entries in the VLAN forward unregistered 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 count** - Displays the total number of static / dynamic unicast and multicast MAC address entries created in the FDB table.
- **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.

28.26 set unicast-mac learning

This command enables or disables unicast-MAC learning feature for a VLAN.

The source MAC learning is not done in the switch when this feature is disabled for the VLAN.

```
set unicast-mac learning { enable | disable | default}
```

Syntax Description

enable	-	Enables unicast-MAC learning feature for a VLAN.
disable	-	Disables unicast-MAC learning feature for a VLAN.

Mode Config-VLAN Mode

Package Workgroup, Enterprise and Metro

Defaults enable

Example

```
iss(config-vlan)# set unicast-mac learning disable
```

- VLAN unicast-MAC learning feature cannot be configured in the VLAN, if the base bridge mode is set as transparent bridging.
- VLAN unicast-MAC learning feature can be configured only in the VLANs that are activated.

Related Command

- **base bridge-mode dot1q-vlan** - Configures the VLAN operation mode as VLAN aware bridging.
- **vlan active** - Activates a VLAN in the switch.
- **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.

28.27 interface range

This command selects the range of physical interfaces and VLAN interfaces to be configured and the no form of the command selects the range of VLAN interfaces to be removed.

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)>

Syntax Description	**interface-type**	-	Interface type.
	slot/port-port	-	Member Ports ID.
	vlan	-	VLAN identifier.
Mode	Global Configuration Mode		
Package	Workgroup, Enterprise and Metro		

Example

```
iss(config)# interface range gigabitethernet 0/1-23 vlan 1 - 2
iss(config-if-range)#

iss(config)# interface range vlan 1 gigabitethernet 0/1
iss(config-if-range)#

iss(config)# interface range vlan 1 - 4 gigabitethernet 0/1-3
iss(config-if-range)#

iss(config)# interface range vlan 1 - 4 gigabitethernet 0/1
iss(config-if-range)#

iss(config)# interface range gigabitethernet 0/1-23 vlan 1 -
128
iss(config-if-range)#
```

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

Related Commands

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

28.28 vlan unicast-mac learning limit

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

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

.The limit represents the maximum number of distinct unicast MAC addresses that can be learnt in the VLAN. This value ranges from 0 to 4294967295. The maximum number of unicast MAC addresses that can be learnt differs for targets. They are:

- 950 for BCM and Marvell boards
- 16128 for xCAT board.

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.

`vlan unicast-mac learning limit <size(0-4294967295)>`

`no vlan unicast-mac learning limit`

Mode Config-VLAN Mode

Package Workgroup, Enterprise and Metro

Defaults The maximum limit that can be configured for the VLAN. This value depends on the unicast entries size and maximum number of VLANs supported.

Example

```
iss(config-vlan)# vlan unicast-mac learning limit 100
```

☞

- 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.

Related Command

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

- **`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.

28.29 forward-all

This command configures the forward-all port details for a VLAN to specify the ports that forward or do not forward all multicast group-addressed frames.

The no form of the command deletes the forward-all port details for the VLAN and sets as none.

```
forward-all ([static-ports ([<interface-type> <0/a-b, 0/c, ...>] [<interface-type> <0/a-b, 0/c, ...>] [port-channel <a,b,c-d>] [none])] [forbidden-ports <interface-type> <0/a-b, 0/c, ...> [<interface-type> <0/a-b, 0/c, ...>] [port-channel <a,b,c-d>]])
```

```
no forward-all
```

Syntax Description

`static-ports` - Configures the ports to which all multicast group-addressed frames are to be forwarded. 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:

1. 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.
2. gigabitethernet - A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet - A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan - Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and 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.

- none - Sets none of the port as static forward-all port for the VLAN.

The configured forward-all static ports should have been already set as member ports for the VLAN.

The configured forward-all static ports should not be a member of the forward-all forbidden port.

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:

1. 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.
2. gigabitethernet - A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet - A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan - Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and 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.

The configured forward-all forbidden ports should not be a member of the forward-all static port.

Mode Config-VLAN Mode

Package Workgroup, Enterprise and Metro

Defaults Both forward all static ports and forward-all forbidden ports are not set (that is, set as none) for the active VLANs.

Example

```
iss(config-vlan)# forward-all  static-ports gigabitethernet 0/1
forbidden-ports gigabitethernet 0/2
```

☞

- The forward-all port details can be configured only in the VLANs that are activated.
- This command is available, only if either the switch NPAPI_WANTED is set as no or switch NPSIM_WANTED is set as yes or switch SWC is set as yes, during the compilation of the exe.

Related Command

- **`ports`** - Statically configures a VLAN entry with the required member ports, untagged ports and forbidden ports.
- **`vlan active`** - Activates a VLAN in the switch.
- **`show forward-all`** - Displays all entries in the VLAN forward all table.

28.30 forward-unregistered

This command configures the forward-unregistered port details for a VLAN to specify the ports that forward or do not forward multicast group-addresses frames for which no more specific forwarding information applies.

The no form of the command sets the forward-unregistered port details for all VLAN to default value.

```
forward-unregistered ([static-ports ([<interface-type> <0/a-b, 0/c, ...>]
[<interface-type> <0/a-b, 0/c, ...>] [port-channel <a,b,c-d>] [none])]
[forbidden-ports <interface-type> <0/a-b, 0/c, ...> [<interface-type> <0/a-b,
0/c, ...>] [port-channel <a,b,c-d>]])
```

```
no forward-unregistered
```

Syntax Description

`static-ports` - Configures the ports to which multicast group-addressed frames for which there is no more specific forwarding information are to be forwarded. 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:

1. 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.
2. gigabitethernet - A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet - A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan - Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and 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.

- none - Sets none of the port as static forward-unregistered port for the VLAN.

The configured forward-unregistered static ports should have been already set as member ports for the VLAN.

The configured forward-unregistered static ports should not be a member of the forward-unregistered forbidden port.

forbidden-ports - Configures the ports for which GMRP should not dynamically register the service requirement attribute forward unregistered 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:

1. 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.
2. gigabitethernet - A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet - A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan - Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and 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.

The configured forward-unregistered forbidden ports should not be a member of the forward-unregistered

static port.

Mode Config-VLAN Mode

Package Workgroup, Enterprise and Metro

Defaults All the ports available in the switch are set as forward-unregistered static ports and forward-unregistered forbidden ports for the default VLAN (VLAN 1).

Both forward-unregistered static ports and forward-unregistered forbidden ports are not set (that is, set as none) for the active VLANs other than the default VLAN (VLAN 1).

Example

```
iss(config-vlan)# forward-unregistered  static-ports
gigabitethernet 0/2 forbidden-ports gigabitethernet 0/1
```

- The forward-unregistered port details can be configured only in the VLANs that are activated.
- This command is available, only if either the switch NPAPI_WANTED is set as no or switch NPSIM_WANTED is set as yes or switch SWC is set as yes, during the compilation of the exe.

Related Command

- **`ports`** - Statically configures a VLAN entry with the required member ports, untagged ports and forbidden ports.
- **`vlan active`** - Activates a VLAN in the switch.
- **`show forward-unregistered`** - Displays all entries in the VLAN forward unregistered table.

28.31 switchport pvid

This command configures the PVID on the specified port.

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

The PVID represents the VLAN ID that is to be assigned to untagged frames or priority-tagged or C-VLAN frames received on the port. The PVID is used for port based VLAN type membership classification. PVID can be configured on CNP and CBP for ports set in PBB bridge mode. This value ranges from 1 to 4094.

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.

switchport pvid <vlan-id(1-4094)>

no switchport pvid

Mode Interface Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults 1 (ID of default VLAN)

Example

```
iss(config-if)# switchport pvid 3
```

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

Related Command

- **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.

28.32 switchport access vlan

This command configures the PVID (Port VLAN Identifier) on a port. The no form of this command sets the PVID to the default value on the port.

This command operates similar to that of the command switchport pvid.

switchport access vlan <vlanid (1-4094)>

no switchport access vlan

Syntax Description	**vlan-id**	-	PVID value to be configured on the port.
Mode	Interface Configuration Mode		
Example	`iss(config-if)# switchport access vlan 3`		

- 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.
- For ports in PBB bridge mode, PVID can be configured on CNP (Customer Network Port) and CBP (Customer Backbone Port).
- 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.

Related Command **show vlan port config** - Displays the VLAN related parameters specific for ports

28.33 switchport acceptable-frame-type

This command configures the type of VLAN dependant BPDU frames such as GMRP BPDU, that the port should accept during the VLAN membership configuration.

The no form of the command resets the acceptable frame type for the port to its default value.

This configuration does not affect VLAN independent BPDU frames such as GVRP BPDU and STP BPDU. It affects only the VLAN dependent BPDU frames.

```
switchport acceptable-frame-type {all | tagged | untaggedAndPrioritytagged }
```

```
no switchport acceptable-frame-type
```

Syntax Description

`all` - 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.

`tagged` - 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.

For ports in PBB bridge mode, the description of tagged frames is given in the below table:

Port Type	What will be considered as TAG
CNP S Tagged	S-Tag
CNP C Tagged	C-Tag
CNP Port Based	S-Tag
PIP	I-Tag
CBP	I-Tag
PNP	B-Tag or S Tag

`untaggedAndPrioritytagged` - 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.

Mode Interface Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults all

Example

```
iss(config-if)# switchport acceptable-frame-type tagged
```

- This command is applicable only for the port configured as switch port.
- 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.
- 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.

Related Command

- **`switchport`** - Configures the port as switch port.
- **`bridge port-type`** - Configures the bridge port type for an interface.
- **`base bridge-mode dot1q-vlan`** - Configures the VLAN operation mode as VLAN aware bridging.
- **`switchport pvid`** - Configures the PVID on the specified port.
- **`switchport ingress-filter`** - Enables ingress filtering feature on the port.
- **`switchport mode`** - Configures the mode of operation for a switch port.
- **`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.

28.34 switchport ingress-filter

This command enables ingress filtering feature on the port.

The no form of the command disables ingress filtering feature on the port. All incoming frames received on the port are accepted.

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.

switchport ingress-filter

no switchport ingress-filter

Mode — Interface Configuration Mode

Package — Workgroup, Enterprise and Metro

Defaults — The ingress filtering feature is disabled on the port.

Example

```
iss(config-if)# switchport ingress-filter
```

- This command is applicable only for the port configured as switch port.
- 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.
- 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.

Related Command

- **switchport** - Configures the port as switch port.
- **bridge port-type** - Configures the bridge port type for an interface.
- **base bridge-mode dot1q-vlan** - Configures the VLAN operation mode as VLAN aware bridging.
- **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.

28.35 port mac-vlan

This command enables MAC-based VLAN membership classification in a port. VLAN membership classification is done based on the MAC address of the source of the received packets.

The no form of the command disables MAC-based VLAN membership classification in the port.

port mac-vlan

no port mac-vlan

Mode Interface Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults MAC based VLAN classification is disabled on all ports.

Example

```
iss(config-if)# port mac-vlan
```

- MAC based VLAN membership classification can be enabled or disabled in the ports without depending on the global status of the MAC based VLAN membership classification.
- The change in global MAC based VLAN membership classification overrides the port membership classification. For example, you have set the classification in the port as enabled while global classification is disabled. Then if you change the global classification as enabled and once again as disabled, the classification in the port will be automatically set as disabled.
- MAC based VLAN membership classification can be enabled / disabled in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Command

- **mac-vlan** - Enables MAC-based VLAN membership classification on all ports of the switch.
- **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.
- **show mac-vlan** - Displays all entries in the MAC map table.

28.36 port subnet – vlan

This command[2] enables subnet based VLAN membership classification in a port. The source IP address in received packet is matched to a VLAN ID using an administrator configured table to perform VLAN membership classification.

The no form of the command disables the subnet based VLAN membership classification in the port.

port subnet-vlan

no port subnet-vlan

Mode Interface Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults Subnet-based VLAN membership classification is disabled on all ports.

Example

```
iss(config-if)# port subnet-vlan
```

- Subnet based VLAN membership classification can be enabled or disabled in the ports without depending on the global status of the subnet based VLAN membership classification.
- The change in global subnet based VLAN membership classification overrides the port membership classification. For example, you have set the classification in the port as enabled while global classification is disabled. Then if you change the global classification as enabled and once again as disabled, the classification in the port will be automatically set as disabled.
- Subnet based VLAN membership classification can be enabled / disabled in the switch, only if the VLAN switching feature is started and enabled in the switch.
- This command is available, only if the switch BCMX_WANTED is set as no during the compilation of the exe.

Related Command

- **subnet-vlan** - Enables subnet-VLAN based membership classification on all ports of the switch.
- **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.
- **show subnet-vlan mapping** - Displays all entries in the subnet map table.

[2] This command is not available for the BCM chipsets.

28.37 port protocol-vlan

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.

The no form of the command disables protocol-VLAN based membership classification in the port.

port protocol-vlan

no port protocol-vlan

Mode Interface Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults Protocol-VLAN based membership classification is enabled on all ports.

Example
```
iss(config-if)# no port protocol-vlan
```

- 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.
- The change in global protocol-VLAN based membership classification overrides the port membership classification. For example, you have set the classification in the port as disabled while global classification is enabled. Then if you change the global classification as disabled and once again as enabled, the classification in the port will be automatically set as enabled.
- 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.

Related Command

- **protocol-vlan** - Enables protocol-VLAN based membership classification on all ports of the switch.
- **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.

28.38 switchport map protocols-group

This command maps the configured protocol group to a particular VLAN ID for an interface.

The no form of the command deletes the entry created for the specified group ID in the Port Protocol Table.

This configuration is used during protocol-VLAN based membership classification.

```
switchport map protocols-group <Group id integer(0-2147483647)>vlan <vlan-id(1-4094)>
```

```
no switchport map protocols-group <Group id integer(0-2147483647)>
```

Syntax 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 from 0 to 2147483647.
`vlan`	-	Configures the VLAN ID to which the configured group should be mapped. This is a unique value that represents the specific VLAN created. This value ranges between 1 and 4094.

Mode Interface Configuration Mode

Package Workgroup, Enterprise and Metro

Example

```
iss(config-if)# switchport map protocols-group 1 vlan 2
```

- The protocol group should have been already created with a specific protocol and encapsulation frame type combination before mapping it to a VID.
- 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.

Related Commands

- **`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.

28.39 switchport priority default

This command configures the default ingress user priority for a port.

The no form of the command resets the default ingress user priority for the port to its default value.

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.

switchport priority default <priority value(0-7)>

no switchport priority default

Mode Interface Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults 0

Example

```
iss(config-if)# switchport priority default 5
```

- 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.

Related Command

- **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.

28.40 switchport mode

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.

```
switchport mode [private-vlan] { access | trunk | hybrid | promiscuous | host
|{dynamic {auto | desirable}} }
```

```
no switchport mode
```

Syntax Description

`private-vlan`	-	Configures Pvlan for the specified VLAN switch port.
`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 GVRP is disabled for that port and acceptable frame type is set as untaggedAndPriority tagged.
`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.
`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 - Dynamic Mode. This can be:

- 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

Package Workgroup, Enterprise and Metro

Defaults hybrid

Example

```
iss(config-if)# switchport mode access
```

- 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.

Related Commands

- **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 forbidden ports.
- **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.

28.41 vlan max-traffic-class

This command configures the maximum number of traffic classes supported on a port.

The no form of the command resets the maximum traffic class value on the port to its default value.

The number of traffic classes supported depends on the hardware used, which can limit the number of traffic classes to a lower number. Aricent ISS 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 from 1 to 8.

vlan max-traffic-class <MAX Traffic class(1-8)>

no vlan max-traffic-class

Mode Interface Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults 8

Example

```
iss(config-if)# vlan max-traffic-class 7
```

☞ 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.

Related Command

- **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.

28.42 vlan map-priority

This command maps an evaluated user priority to a traffic class on a port.

The no form of the command maps the default traffic class to the specified priority value on the 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.

```
vlan map-priority <priority value(0-7)> traffic-class <Traffic class value(0-7)>
```

```
no vlan map-priority <priority value (0-7)>
```

Syntax Description

`<priority value(0-7)>`	-	Configures the priority value to be set for the specified traffic class. This value ranges from 0 to 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 from 0 to 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.
- 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

Package Workgroup, Enterprise and Metro

Defaults 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

Example

```
iss(config-if)# vlan map-priority 2 traffic-class 2
```

- 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.

Related Command

- **`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.

28.43 mac-map

This command configures VLAN-MAC address mapping that is used only for MAC-based VLAN membership classification.

The no form of the command deletes the specified VLAN-MAC address mapping entry.

In MAC-based VLAN membership classification, VLAN membership classification is done based on the MAC address of the source of received packets.

```
mac-map <aa:aa:aa:aa:aa:aa> vlan <vlan-id(1-4094)> [mcast-bcast {discard | allow}]
```

```
no mac-map <aa:aa:aa:aa:aa:aa>
```

Syntax 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`	-	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.
`mcast-bcast`	-	Configures the way of handling of broadcast and multicast traffic for packets received from source. The options are: • discard - Processes all multicast / broadcast untagged frames that contain the specified MAC address as the source address. • allow - Drops all multicast / broadcast untagged frames that contain the specified MAC address as the source address.

Mode Interface Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults mcast-bcast - allow

Example

```
iss(config-if)# mac-map 00:11:22:33:44:55 vlan 2 mcast-bcast discard
```

☞
- Only the VLANs that are activated in the switch can be mapped to the specified MAC address.
- VLAN-MAC address mapping can be configured in the port, only if the VLAN

switching feature is started and enabled in the switch.

Related Commands

- **`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.

28.44 switchport filtering-utility-criteria

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.

`switchport filtering-utility-criteria {default | enhanced}`

Syntax Description

`default`	- 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.
`enhanced`	- Allows learning of source MAC from a packet received on the port, only if the following conditions are satisfied: • 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. • 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.

Mode Interface Configuration Mode

Package Workgroup, Enterprise and Metro

Default default

Example

```
iss(config-if)# switchport filtering-utility-criteria
enhanced
```

☞
- 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.
- This command is applicable only for the port configured as switch port.

Related Command
- **`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

28.45 switchport protected

This command enables switchport protection feature for a port.

The no form of the command disables switchport protection feature for the 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.

switchport protected

no switchport protected

Mode Interface Configuration Mode

Package Workgroup, Enterprise and Metro

Default The switchport protection feature is disabled in the port.

Example

```
iss(config-if)# switchport protected
```

- 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.

Related Command

- **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.

28.46 debug vlan

This command enables the tracing of the VLAN submodule 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 submodule 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.

```
debug vlan { global | [{fwd | priority | redundancy} [initshut] [mgmt] [data]
[ctpl] [dump] [os] [failall] [buffer] [all]] [switch <context_name>] }
```

```
no debug vlan { global | [{fwd | priority | redundancy} [initshut] [mgmt]
[data] [ctpl] [dump] [os] [failall] [buffer] [all]] [switch <context_name>] }
```

Syntax Description

`global`	-	Generates debug statements for all kinds of traces.
`fwd`	-	Sets the submodule as VLAN 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.
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	-	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 whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode Privileged Exec Mode

Package Workgroup, Enterprise and Metro

Defaults Tracing of the VLAN submodule is disabled.

Example

```
iss # debug vlan fwd all
```

☞ The VLAN submodule tracing related configuration takes effect in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Command

- **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.
- **show debugging** - Displays state of each debugging option.

28.47 show vlan

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 contain the member ports, untagged ports, forbidden ports, VLAN name and the status of that VLAN entry.

If switch L2RED_WANTED is set as no during compilation of exe

```
show vlan [brief | id <vlan-range> | summary] [ switch <context_name>]
```

If switch L2RED_WANTED is set as yes during compilation of exe

```
show vlan [{brief | id <vlan-range> | summary | redundancy}] [ switch <context_name>]
```

Syntax 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`	-	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.
`switch`	-	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

Package Workgroup, Enterprise and Metro

Example **Single Instance:**

```
iss# show vlan brief

Vlan database
-------------
Vlan ID         : 1
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
-----------------------------------------------------
iss# show vlan summary

Number of vlans : 1
```

Multiple Instance:

```
iss# show vlan

Switch - default

Vlan database
-------------
Vlan ID             : 1
Member Ports        : Gi0/49
Untagged Ports      : Gi0/49
Forbidden Ports     : None
Name                :
Status              : Permanent
-----------------------------------------------------

Switch - cust1

Vlan database
-------------
Vlan ID             : 1
Member Ports        : Gi0/1, Gi0/2, Gi0/3, Gi0/4, Gi0/5, Gi0/6
Untagged Ports      : Gi0/1, Gi0/2, Gi0/3, Gi0/4, Gi0/5, Gi0/6
Forbidden Ports     : None
```

```
Name                 :
Status               : Permanent
-----------------------------------------------------
Vlan ID              : 20
Member Ports         : Gi0/1
Untagged Ports       : Gi0/1
Forbidden Ports      : None
Name                 :
Status               : Permanent
-----------------------------------------------------
Vlan ID              : 30
Member Ports         : Gi0/2
Untagged Ports       : None
Forbidden Ports      : None
Name                 :
Status               : Dynamic Gvrp
-----------------------------------------------------
```

- This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.
- This command is available, only if the switch NPAPI_WANTED is set as no during the compilation of the exe.

Related Commands

- **`no shutdown vlan`** - Starts and enables VLAN switching feature in the switch.
- **`ports`** - Statically configures a VLAN entry with the required member ports, untagged ports and forbidden ports.
- **`vlan active`** - Activates a VLAN in the switch.

28.48 show vlan device info

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.

show vlan device info [switch <context_name>]

Syntax Description	**switch**	-	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. This parameter is specific to multiple instance feature.

Mode Privileged EXEC Mode

Package Workgroup, Enterprise and Metro

Example **Single Instance:**

```
iss# 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
Max supported vlans                  : 1024
Unicast mac learning limit           : 150
```

Multiple Instance:

```
iss# show vlan device info
```

```
Switch default

Vlan device configurations
--------------------------
Vlan Status                          : Enabled
Vlan Oper status                     : Enabled
Gvrp status                          : Enabled
Gmrp status                          : Enabled
Gvrp Oper status                     : Enabled
Gmrp Oper status                     : Enabled
Mac-Vlan Status                      : Disabled
Protocol-Vlan Status                 : Enabled
Bridge Mode                          : Customer Bridge
Traffic Classes                      : Enabled
Vlan Operational Learning Mode       : IVL
Version number                       : 1
Max Vlan id                          : 4094
Max supported vlans                  : 1024
Unicast mac learning limit           : 150
```

☞ This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Commands

- **`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 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.

28.49 show vlan device capabilities

This command displays only the list of VLAN features such as traffic class feature, supported in the switch / all contexts.

```
show vlan device capabilities [ switch <context_name>]
```

Syntax Description

switch	-	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 whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode Privileged EXEC Mode

Package Workgroup, Enterprise and Metro

Example

Single Instance:

```
iss# 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
```

Multiple Instance:

```
iss# show vlan device capabilities

Switch - default
Vlan device capabilities
--------------------------

Extended filtering services
Traffic classes
Static Entry Individual port
IVL capable
SVL capable
Hybrid capable
Configurable Pvid Tagging

Switch - cust1
Vlan device capabilities
```

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

Extended filtering services
Traffic classes
Static Entry Individual port
IVL capable
SVL capable
Hybrid capable
Configurable Pvid Tagging
```

☞ This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Commands

- **`no shutdown vlan`** - Starts and enables VLAN switching feature in the switch.

28.50 show fid

This command displays the FID VLAN mapping information of all FIDs in the switch / all contexts. This information contains the FID and the ID of the VLAN that is mapped to the FID.

```
show fid [<integer(1-4094)> | detail] [ switch <context_name>]
```

Syntax Description

`<integer(1-4094)>`	-	Displays the FID VLAN mapping information of the specified FID and the default hybrid learning mode configured in the switch / all contexts.
`detail`	-	Displays the FID VLAN mapping information of all FIDs in the switch / all contexts and the default hybrid learning mode configured in the switch / all contexts.
`switch`	-	Displays the FID VLAN mapping information of the specified FID / all FID along with / without the configured default hybrid learning mode details, 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

Package Workgroup, Enterprise and Metro

Example **Single Instance:**

```
iss# show fid 2

Default Learning Type    : IVL
Fid Vlan mapping information
----------------------------
Fid     : 2
Vlan's  : 2,
----------------------------
iss# show fid detail

Default Learning Type    : IVL
Fid Vlan mapping information
----------------------------
Fid     : 1
Vlan's  : 1,
----------------------------
Fid     : 2
Vlan's  : 2,
----------------------------
```

```
Fid     : 3
Vlan's  : 3,
---------------------------
Fid     : 4
Vlan's  : 4,
---------------------------
Fid     : 5
Vlan's  : 5,
---------------------------
Fid     : 6
Vlan's  : 6,
```

Multiple Instance:

```
iss# show fid 2

Switch - default
Default Learning Type    : IVL

Fid Vlan mapping information
---------------------------
Fid     : 2
Vlan's  : 2,
---------------------------
Switch - cust1
Default Learning Type    : IVL

Fid Vlan mapping information
---------------------------
Fid     : 2
Vlan's  : 2,
---------------------------
```

- This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.
- This command is available, only if either the switch NPAPI_WANTED is set as no or switch NPSIM_WANTED is set as yes, during the compilation of the exe.

Related Commands

- **`fid`** - Configures a VLAN or a list of VLANs to use a filtering database for making forwarding decisions.
- **`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.
- **`no shutdown vlan`** - Starts and enables VLAN switching feature in the switch.

28.51 show forward-all

This command displays all entries in the VLAN forward all table. These entries contain forward all details of all active VLANs in the switch. The details have VLAN ID and information regarding forward all ports, forward all static ports and forward all forbidden ports assigned to the VLAN.

```
show forward-all [ switch <context_name>]
```

Syntax Description

switch	-	Displays all entries in the VLAN forward all table, 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

Package Workgroup, Enterprise and Metro

Example

Single Instance:

```
iss# show forward-all

Vlan Forward All Table
----------------------

Vlan ID : 1
ForwardAll Ports          : Gi0/2
ForwardAll Static Ports   : Gi0/2
ForwardAll ForbiddenPorts : Gi0/1
------------------------------------------------------------
Vlan ID : 2
ForwardAll Ports          : Gi0/1
ForwardAll Static Ports   : Gi0/1
ForwardAll ForbiddenPorts : Gi0/2
------------------------------------------------------------
```

Multiple Instance:

```
iss# show forward-all

Switch - default

Vlan Forward All Table
----------------------

Vlan ID : 1
ForwardAll Ports          : Gi0/2
ForwardAll Static Ports   : Gi0/2
ForwardAll ForbiddenPorts : Gi0/1
```

```
------------------------------------------------------------
Vlan ID : 2
ForwardAll Ports          : Gi0/1
ForwardAll Static Ports   : Gi0/1
ForwardAll ForbiddenPorts : Gi0/2
------------------------------------------------------------
```

- This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.
- This command is available, only if either the switch NPAPI_WANTED is set as no or switch NPSIM_WANTED is set as yes or switch SWC is set as yes, during the compilation of the exe.

Related Commands

- **`vlan active`** - Activates a VLAN in the switch.
- **`forward-all`** - Configures the forward-all port details for a VLAN to specify the ports that forward or do not forward all multicast group-addressed frames.
- **`no shutdown vlan`** - Starts and enables VLAN switching feature in the switch.

28.52 show forward-unregistered

This command displays all entries in the VLAN forward unregistered table. These entries contain forward-unregistered port details of all active VLANs in the switch. The details have VLAN ID and information regarding unregistered ports, unregistered static ports and unregistered forbidden ports assigned to the VLAN.

show forward-unregistered [switch <context_name>]

Syntax Description	**switch**	-	Displays all entries in the VLAN forward unregistered table, 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

Package Workgroup, Enterprise and Metro

Example

Single Instance:

```
iss# show forward-unregistered

Vlan Forward Unregistered Table
-------------------------------

Vlan ID : 1
Unreg ports           : Gi0/1
Unreg Static Ports    : Gi0/1
Unreg Forbidden Ports : Gi0/2
-----------------------------------------------------
Vlan ID : 2
Unreg ports           : Gi0/2
Unreg Static Ports    : Gi0/2
Unreg Forbidden Ports : Gi0/1
-----------------------------------------------------
```

Multiple Instance:

```
iss# show forward-unregistered

Switch - default

Vlan Forward Unregistered Table
-------------------------------

Vlan ID : 1
Unreg ports           : Gi0/49
Unreg Static Ports    : Gi0/49
Unreg Forbidden Ports : None
```

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

Switch - cust1

Vlan Forward Unregistered Table
--------------------------------

Vlan ID : 1
Unreg ports           : Gi0/1, Gi0/2, Gi0/3, Gi0/4, Gi0/5, Gi0/6
Unreg Static Ports    : Gi0/1, Gi0/2, Gi0/3, Gi0/4, Gi0/5, Gi0/6
Unreg Forbidden Ports : None
-------------------------------------------------------
Vlan ID : 20
Unreg ports           : Gi0/1
Unreg Static Ports    : Gi0/1
Unreg Forbidden Ports : None
-------------------------------------------------------
Vlan ID : 30
Unreg ports           : Gi0/2
Unreg Static Ports    : Gi0/2
Unreg Forbidden Ports : None
-------------------------------------------------------
```

- This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.
- This command is available, only if either the switch NPAPI_WANTED is set as no or switch NPSIM_WANTED is set as yes or switch SWC is set as yes, during the compilation of the exe.

Related Commands

- **`vlan active`** - Activates a VLAN in the switch.
- **`forward-unregistered`** - Configures the forward-unregistered port details for a VLAN to specify the ports that forward or do not forward multicast group-addresses frames for which no more specific forwarding information applies.
- **`no shutdown vlan`** - Starts and enables VLAN switching feature in the switch.

28.53 show vlan traffic-classes

This command displays the evaluated user priority and traffic class mapping information of all interfaces available in the switch / all contexts.

```
show vlan traffic-classes [{port <interface-type> <interface-id> | switch <context_name>}]
```

Syntax Description

port - Displays the evaluated user priority and traffic class mapping information of the specified interface.

The details to be provided are:

- <interface-type> - Sets the type of interface. The interface can be:

1. 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.
2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. i-lan – Internal LAN created on a bridge per IEEE 802.1ap.

- <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 i-lan. Only i-lan ID is provided, for interface type i-lan.

switch - 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.

Mode Privileged EXEC Mode

Package Workgroup, Enterprise and Metro

Example **Single Instance:**

```
iss# 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
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
```

Multiple Instance:

```
iss# show vlan traffic-classes

Switch - default

Traffic Class table
---------------------
Port      Priority    Traffic Class
-----     ---------   -------------
Gi0/49     0           2
Gi0/49     1           0
Gi0/49     2           1
Gi0/49     3           3
Gi0/49     4           4
Gi0/49     5           5
Gi0/49     6           6
Gi0/49     7           7

Switch - cust1

Traffic Class table
---------------------
Port      Priority    Traffic Class
-----     ---------   -------------
Gi0/1     0           2
Gi0/1     1           0
Gi0/1     2           1
Gi0/1     3           3
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
```

This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Commands

- **`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.

28.54 show vlan port config

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.

```
show vlan port config [{port <interface-type> <interface-id> | switch <context_name>}]
```

Syntax Description

port - Displays the VLAN related port specific information for the specified interface.

The details to be provided are:

- <interface-type> - Sets the type of interface. The interface can be:

1. 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.
2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and port-channel.

switch - 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 whose maximum size is 32.

This parameter is specific to multiple instance feature.

Mode Privileged EXEC Mode

Package Workgroup, Enterprise and Metro

Example **Single Instance:**

```
iss# show vlan port config

Vlan Port configuration table
------------------------------
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
 ------------------------------------------------------
```

Multiple Instance:

```
iss# show vlan port config

Switch - default

Vlan Port configuration table
------------------------------
Port Gi0/49
 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
 Port-and-Protocol Based Support     : Enabled
 Default Priority                    : 0
 Dot1x Protocol Tunnel Status        : Peer
 LACP Protocol Tunnel Status         : Peer
 Spanning Tree Tunnel Status         : Peer
 GVRP Protocol Tunnel Status         : Peer
 GMRP Protocol Tunnel Status         : Peer
 IGMP Protocol Tunnel Status         : Peer
 Filtering Utility Criteria          : Enhanced
 ---------------------------------------------------------

Switch - cust1

Vlan Port configuration table
-----------------------------
Port Gi0/1
 Port Vlan ID                        : 20
 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
 Port-and-Protocol Based Support     : Enabled
 Default Priority                    : 0
 ---------------------------------------------------------
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                : 00:01:02:03:04:0e
 Port Restricted Vlan Registration   : Disabled
 Port Restricted Group Registration  : Disabled
 Mac Based Support                   : Disabled
 Port-and-Protocol Based Support     : Enabled
 Default Priority                    : 0
 ---------------------------------------------------------
```

This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Commands

- **`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 mac-vlan`** - Enables MAC-based VLAN membership classification in a port.
- **`port subnet – vlan`** - Enables subnet based VLAN membership classification 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.

28.55 show vlan protocols-group

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.

```
show vlan protocols-group [ switch <context_name>]
```

Syntax Description

switch	-	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 whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode Privileged EXEC Mode

Package Workgroup, Enterprise and Metro

Example

Single Instance:

```
iss# show vlan protocols-group

Protocol Group Table
--------------------
-----------------------------------------
Frame Type      Protocol             Group
-----------------------------------------
Enet-v2         IP                   1
Snap            Novell               2
-----------------------------------------
```

Multiple Instance:

```
iss# show vlan protocols-group

Switch - default

Protocol Group Table
--------------------
-----------------------------------------
Frame Type      Protocol             Group
-----------------------------------------
Enet-v2         IP                   1
Snap            Novell               2
-----------------------------------------
```

☞ This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Commands

- **`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.

28.56 show protocol-vlan

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 contain 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.

```
show protocol-vlan [ switch <context_name>]
```

Syntax Description

switch	-	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 whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode Privileged EXEC Mode

Package Workgroup, Enterprise and Metro

Example

Single Instance:

```
iss# show protocol-vlan

Port Protocol Table
---------------------------------------
Port            Group          Vlan ID
---------------------------------------
Gi0/2           1              2
Gi0/1           2              3
---------------------------------------
```

Multiple Instance:

```
iss# show protocol-vlan

Switch - default

Port Protocol Table
---------------------------------------
Port            Group          Vlan ID
---------------------------------------
Gi0/2           1              2
Gi0/1           2              3
---------------------------------------
```

☞ This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Command

- **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.

28.57 show mac-vlan

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.

show mac-vlan [{interface <interface-type> <interface-id> | switch <string(32)>]

Syntax Description

interface - Displays all entries in the MAC map table for the specified interface.

The details to be provided are:

- <interface-type> - Sets the type of interface. The interface can be:

1. 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.
2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and port-channel.

switch - 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 whose maximum size is 32.

This parameter is specific to multiple instance feature.

Mode Privileged EXEC Mode

Package Workgroup, Enterprise and Metro

Example

Single Instance:

```
iss# 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
     00:22:22:22:22:22    1              allow
```

Multiple Instance:

```
iss# show mac-vlan switch cust1

Switch - cust1

Mac Map Table
--------------
Mac Address          Vlan ID
-----------          -------
00:11:22:33:44:55    2
```

☞ This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Commands

- **mac-vlan** - Enables MAC-based VLAN membership classification on all ports of the switch.
- **port mac-vlan** - Enables MAC-based VLAN membership classification in a port.
- **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.

28.58 show subnet vlan mapping

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.

If switch BCMX_WANTED is set as no during compilation of exe:

```
show subnet-vlan mapping [{interface <interface-type> <interface-id> | switch <string(32)>}]
```

If switch BCMX_WANTED is set as yes during compilation of exe:

```
show subnet-vlan mapping [switch <string(32)>]
```

Syntax Description

interface - Displays all entries in the subnet map table for the specified interface.

The details to be provided are:

- <interface-type> - Sets the type of interface. The interface can be:

1. 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.
2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and port-channel.

switch - Displays all entries in the subnet map table, 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

Package Workgroup, Enterprise and Metro

Example

Single Instance

```
iss# show subnet-vlan mapping

Subnet Map Table For Port 2--Subnet Vlan Enabled
------------------------------------------------
Subnet Address      Vlan ID        ARP Traffic
------------------------------------------------
172.30.0.0          1              allow
```

Multiple Instance

```
iss# show subnet-vlan mapping

Switch default


Switch 1

Subnet Map Table For Port 2--Subnet Vlan Enabled
------------------------------------------------
Subnet Address      Vlan ID        ARP Traffic
------------------------------------------------
172.30.0.0          2              allow


Switch 2

Subnet Map Table For Port 4--Subnet Vlan Enabled
------------------------------------------------
Subnet Address      Vlan ID        ARP Traffic
------------------------------------------------
172.31.0.0          3              allow
```

☞ This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Commands

- **`port subnet - vlan`** - Enables subnet based VLAN membership classification in a port.
- **`subnet-vlan`** - Enables subnet-VLAN based membership classification on all ports of the switch.
- **`map subnet`** - Configures VLAN-IP subnet address mapping that is used only for subnet-VLAN based membership classification.

- **`no shutdown vlan`** - Starts and enables VLAN switching feature in the switch.

28.59 show vlan counters

This command displays the VLAN traffic statistics details for all VLANs (for which the member port details are configured) available in the switch / all contexts. The details include VLAN ID, number of valid frames received in the interface from the VLAN, number of valid frames transmitted through the interface to the VLAN, and number of frames discarded.

```
show vlan counters [vlan <vlan-range>] [ switch <context_name>]
```

Syntax Description

vlan	-	Displays the VLAN traffic 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 for which the member port details are configured.
switch	-	Displays the VLAN traffic statistics details for all VLANs or specified VLANs alone, 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

Package Workgroup, Enterprise and Metro

Example **Single Instance:**

```
iss# show vlan counters

Port Vlan statistics
-------------------------
Port Gi0/1
 Vlan ID    : 1
 In frames  : 342
 Out frames : 345
 Discards   : 0
Port Gi0/1
 Vlan ID    : 2
 In frames  : 446
 Out frames : 248
 Discards   : 0
Port Gi0/2
 Vlan ID    : 2
 In frames  : 115
 Out frames : 517
```

```
 Discards    : 7
Port Gi0/2
 Vlan ID     : 2
 In frames   : 0
 Out frames  : 0
 Discards    : 0
```

Multiple Instance:

```
iss# show vlan counters
Switch - default

Port Vlan statistics
--------------------------
Port Gi0/49
 Vlan ID     : 1
 In frames   : 75
 Out frames  : 0
 Discards    : 0
--------------------------

Switch - cust1

Port Vlan statistics
--------------------------
Port Gi0/1
 Vlan ID     : 1
 In frames   : 0
 Out frames  : 0
 Discards    : 0
--------------------------
Port Gi0/1
 Vlan ID     : 20
 In frames   : 0
 Out frames  : 0
 Discards    : 0
--------------------------
Port Gi0/2
 Vlan ID     : 1
 In frames   : 70
 Out frames  : 0
 Discards    : 0
--------------------------
Port Gi0/2
 Vlan ID     : 30
 In frames   : 0
 Out frames  : 0
 Discards    : 2
--------------------------
```

- This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.
- This command is available, only if either the switch NPAPI_WANTED is set as no or switch NPSIM_WANTED is set as yes, during the compilation of the exe.

Related

- **`ports`** - Statically configures a VLAN entry with the required member ports,

Commands untagged ports and forbidden ports.

- **`no shutdown vlan`** - Starts and enables VLAN switching feature in the switch.

28.60 show vlan statistics

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.

```
show vlan statistics [vlan <vlan-range>] [ switch <context_name>]
```

Syntax Description

vlan	-	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	-	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 whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode Privileged EXEC Mode

Package Workgroup, Enterprise and Metro

Example **Single Instance**

```
iss# show vlan statistics vlan 1

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

Multiple Instance

```
iss# show vlan statistics vlan 1 switch sw1

          Switch - sw1

          Unicast/broadcast Vlan statistics
          -------------------------------------
          Vlan Id                        : 1
          Unicast frames                 : 16
          Broadcast frames               : 10
          Unicast frames flooded         : 25
          -------------------------------------
```

☞ This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Command

- **`vlan active`** - Activates a VLAN in the switch.
- **`ports`** - Statically configures a VLAN entry with the required member ports, untagged ports and forbidden ports.
- **`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.

28.61 show vlan learning params

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.

```
show vlan learning params [vlan <vlan-range>] [ switch <string(32)>]
```

Syntax Description

vlan	-	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.
switch	-	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 whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode Privileged EXEC Mode

Package Workgroup, Enterprise and Metro

Example

Single Instance

```
iss# 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
-------------------------------------
```

Multiple Instance

```
iss# show vlan learning params

Switch default
```

```
Unicast MAC Learning Paramters
-------------------------------------
Vlan Id                   : 1
Mac Learning Admin-Status : Enable
Mac Learning Oper-Status  : Disable
Mac Learning Limit        : 1500
-------------------------------------

Switch switch1

Unicast MAC Learning Paramters
-------------------------------------
Vlan Id                   : 1
Mac Learning Admin-Status : Enable
Mac Learning Oper-Status  : Disable
Mac Learning Limit        : 1500
-------------------------------------
Vlan Id                   : 2
Mac Learning Admin-Status : Enable
Mac Learning Oper-Status  : Enable
Mac Learning Limit        : 1500
-------------------------------------
```

☞ This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Commands

- **`vlan active`** - Activates a VLAN in the switch.
- **`ports`** - Statically configures a VLAN entry with the required member ports, untagged ports and forbidden ports.
- **`set unicast-mac learning`** - Enables or disables unicast-MAC learning feature for a VLAN.
- **`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.

28.62 show mac-address-table

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.

If switch L2RED_WANTED is set as no during compilation of exe:

```
show mac-address-table [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>]
[{interface <interface-type> <interface-id> | switch <context_name>}]
```

If switch L2RED_WANTED is set as yes during compilation of exe:

```
show mac-address-table {[[vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>]
[{interface <interface-type> <interface-id> | switch <context_name> }]] |
[redundancy] }
```

Syntax Description

vlan - 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 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 - Displays all static / dynamic unicast and multicast MAC entries created in the MAC address 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:

1. 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.
2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per

second. This Ethernet supports only full duplex links.

4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and port-channel.

switch - 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 whose maximum size is 32.

This parameter is specific to multiple instance feature.

redundancy - Displays all static / dynamic unicast and multicast MAC entries for standby node.

Mode Privileged EXEC Mode

Package Workgroup, Enterprise and Metro

Example **Single Instance**

```
iss# 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
```

Multiple Instance

```
iss# show mac-address-table

Switch default

Vlan    Mac Address          Type    ConnectionId  PwIndex  Ports
----    -----------          ----    ------------  -------  -----
1     00:10:00:00:00:07      Learnt                  -      Gi0/4
```

```
Total Mac Addresses displayed: 1


Switch sw1

Vlan  Mac Address         Type    ConnectionId   PwIndex  Ports
----  -----------         ----    ------------   -------  -----
2     00:10:00:01:02:03   Learnt                   -      Gi0/1

Total Mac Addresses displayed: 1
```

☞ This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Commands

- **`no shutdown vlan`** - Starts and enables VLAN switching feature in the switch.

28.63 show dot1d mac-address-table

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).

```
show dot1d mac-address-table [address <aa:aa:aa:aa:aa:aa>] [{interface
<interface-type> <interface-id> | switch <context_name>}]
```

Syntax Description

address - 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:

1. 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.
2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and port-channel.

switch - 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 whose maximum size is 32.

This parameter is specific to multiple instance feature.

Mode Privileged EXEC Mode

Package Workgroup, Enterprise and Metro

Example

Single Instance

```
iss# show dot1d mac-address-table

Mac Address          Type      Ports
-----------          ----      -----
00:00:d1:20:18:d4    Learnt    Gi0/1

Total Mac Addresses displayed: 1
```

Multiple Instance

```
iss# show dot1d mac-address-table

Switch default

Mac Address          Type      Ports
-----------          ----      -----
00:00:d1:20:18:d4    Learnt    Gi0/1

Total Mac Addresses displayed: 1
```

☞ This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Commands

- **`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.

28.64 show mac-address-table count

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.

```
show mac-address-table count [vlan <vlan-id(1-4094)>] [ switch <context_name>]
```

Syntax Description

vlan	-	Displays the total number of static / dynamic unicast and multicast MAC address entries available in the FDB table for the specified VLAN ID. This is a unique value that represents the specific VLAN. This value ranges between 1 and 4094.
switch	-	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 whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode Privileged EXEC Mode

Package Workgroup, Enterprise and Metro

Example **Single Instance**

```
iss# show mac-address-table count

Mac Entries for Vlan 1:
-------------------------
Dynamic Unicast Address Count     : 1
Dynamic Multicast Address Count   : 0
Static Unicast Address Count      : 1
Static Multicast Address Count    : 1
---------------------------------------

Mac Entries for Vlan 2:
-------------------------
Dynamic Unicast Address Count     : 1
Dynamic Multicast Address Count   : 0
Static Unicast Address Count      : 1
Static Multicast Address Count    : 0
---------------------------------------
```

Multiple Instance:

```
iss# show mac-address-table count switch cust1

Switch - cust1

Mac Entries for Vlan 1:
-------------------------
Dynamic Unicast Address Count    : 1
Dynamic Multicast Address Count  : 0
Static Unicast Address Count     : 0
Static Multicast Address Count   : 0
---------------------------------------

Mac Entries for Vlan 20:
-------------------------
Dynamic Unicast Address Count    : 0
Dynamic Multicast Address Count  : 0
Static Unicast Address Count     : 0
Static Multicast Address Count   : 0
---------------------------------------

Mac Entries for Vlan 30:
-------------------------
Dynamic Unicast Address Count    : 0
Dynamic Multicast Address Count  : 0
Static Unicast Address Count     : 0
Static Multicast Address Count   : 0
---------------------------------------
```

☞ This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Commands

- **`vlan active`** - Activates a VLAN in the switch.
- **`ports`** - Statically configures a VLAN entry with the required member ports, untagged ports and forbidden ports.
- **`no shutdown vlan`** - Starts and enables VLAN switching feature in the switch.

28.65 show mac-address-table static unicast

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.

```
show mac-address-table static unicast [vlan <vlan-range>] [address
<aa:aa:aa:aa:aa:aa>] [{interface <interface-type> <interface-id> | switch
<context_name>}]
```

Syntax Description

vlan - 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 - 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:

1. 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.
2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and port-channel.

switch - Displays all static unicast MAC entries, 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

Package Workgroup, Enterprise and Metro

Example

Single Instance:

```
iss# 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
```

Multiple Instance:

```
iss# sh mac-address-table static unicast switch cust1
Switch - cust1

Vlan  Mac Address        SrvInst/  Status         Ports
----  -----------        --------  ------         -----
1     00:11:22:33:44:55   Gi0/2   Permanent      Gi0/3

Total Mac Addresses displayed: 1
```

☞ This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Commands

- **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.

28.66 show dot1d mac-address-table static unicast

This command displays all static unicast MAC address entries created in the FDB table, when the VLAN base bridge mode is transparent bridging.

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.

```
show dot1d mac-address-table static unicast [address <aa:aa:aa:aa:aa:aa>]
[interface <interface-type> <interface-id>]
```

Syntax Description

address - Displays all static unicast MAC entries created in the FDB table for the specified unicast MAC address.

interface-type - Displays all static unicast MAC entries for the specified interface.

The details to be provided are:

- <interface-type> - Sets the type of interface. The interface can be:

1. 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.
2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and port-channel.

Mode Privileged EXEC Mode

Package Workgroup, Enterprise and Metro

Example

```
iss# show dot1d mac-address-table static unicast address
00:01:02:03:04:21

Mac Address        RecvPort    Status              Ports
-----------        --------    ------              -----
00:11:22:33:44:55                 Permanent       Gi0/2
Total Mac Addresses displayed: 1

iss# show dot1d mac-address-table static unicast address
00:11:22:33:44:55

Mac Address        RecvPort    Status              Ports
-----------        --------    ------              -----
00:11:22:33:44:55                 Permanent       Gi0/2

Total Mac Addresses displayed: 1
```

☞ This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related commands

- **`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.

28.67 show mac-address-table static multicast

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.

```
show mac-address-table static multicast [vlan <vlan-range>] [address
<aa:aa:aa:aa:aa:aa>] [{interface <interface-type> <interface-id> | switch
<context_name>}]
```

Syntax Description

vlan - 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 - 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:

1. 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.
2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and port-channel.

switch - Displays all static multicast MAC entries, 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

Package Workgroup, Enterprise and Metro

Example **Single Instance:**

```
iss# 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
```

Multiple Instance:

```
iss# sh mac-address-table static multicast switch cust1
Switch - cust1

Static Multicast Table
----------------------
Vlan            : 1
Mac Address     : 01:02:03:04:05:06
Receive Port    : Gi0/2
Member Ports    : Gi0/3

Status          : Permanent
-----------------------------------------------

Total Mac Addresses displayed: 1
```

☞ This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Commands

- **`no shutdown vlan`** - Starts and enables VLAN switching feature in the switch.

28.68 show dot1d mac-address-table static multicast

This command displays all static multicast MAC address entries created in the FDB table, when the VLAN base bridge mode is transparent bridging.

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.

```
show dot1d mac-address-table static multicast [address <aa:aa:aa:aa:aa:aa>]
[interface <interface-type> <interface-id>]
```

Syntax Description

address - Displays all static multicast MAC entries created in the FDB table for the specified multicast MAC address.

interface - Displays all static multicast MAC entries for the specified interface.

The details to be provided are:

- <interface-type> - Sets the type of interface. The interface can be:

1. 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.
2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and port-channel.

Mode Privileged EXEC Mode

Package Workgroup, Enterprise and Metro

Example

```
iss# 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

iss# show dot1d mac-address-table static multicast interface
gigabitethernet 0/2

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
```

☞ This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related commands

- **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.

28.69 show mac-address-table dynamic unicast

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.

```
show mac-address-table dynamic unicast [vlan <vlan-range>] [address
<aa:aa:aa:aa:aa:aa>] [{interface <interface-type> <interface-id> | switch
<context_name>}]
```

Syntax Description

vlan - 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 - 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:

1. 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.
2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and port-channel.

switch - Displays all dynamically learnt unicast entries, 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

Package Workgroup, Enterprise and Metro

Example **Single Instance:**

```
iss# 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
```

Multiple Instance:

```
iss# show mac-address-table dynamic unicast

Switch - default

Vlan    Mac Address          Type     Ports
----    -----------          ----     -----
1       00:02:02:03:04:04    Learnt   Gi0/2
1       00:03:02:03:04:04    Learnt   Gi0/3
2       00:02:02:03:04:04    Learnt   Gi0/2
2       00:03:02:03:04:04    Learnt   Gi0/3
3       00:02:02:03:04:04    Learnt   Gi0/2
3       00:03:02:03:04:04    Learnt   Gi0/3

Total Mac Addresses displayed: 6
```

☞ This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Commands

- **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.

28.70 show mac-address-table dynamic multicast

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.

```
show mac-address-table dynamic multicast [vlan <vlan-range>] [address
<aa:aa:aa:aa:aa:aa>] [{interface <interface-type> <interface-id> | switch
<context_name>}]
```

Syntax Description

vlan	-	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	-	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: 1. 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. 2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second. 3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links. 4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap. 5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and port-channel.

switch - Displays all dynamically learnt multicast entries, 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

Package Workgroup, Enterprise and Metro

Example **Single Instance:**

```
iss# 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
```

Multiple Instance:

```
iss# show mac-address-table dynamic multicast

Switch - default

Vlan    Mac Address          Type     Ports
----    -----------          ----     -----
2       01:02:02:02:02:02    Learnt   Gi0/2, Gi0/3
3       01:02:02:02:02:02    Learnt   Gi0/2
3       01:03:03:03:03:03    Learnt   Gi0/3

Total Mac Addresses displayed: 3
```

☞ This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Commands

- **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.

28.71 show mac-address-table aging-time

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.

```
show mac-address-table aging-time [ switch <context_name>]
```

Syntax Description

switch	-	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 whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode Privileged EXEC Mode

Package Workgroup, Enterprise and Metro

Example

Single Instance:

```
iss# show mac-address-table aging-time

Mac Address Aging Time: 300
```

Multiple Instance:

```
iss# show mac-address-table aging-time

Context default: Mac Address Aging Time: 300
```

☞ This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Commands

- **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.
- **no shutdown vlan** - Starts and enables VLAN switching feature in the switch.

28.72 show wildcard

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.

show wildcard {mac-address <mac_addr> | broadcast} [switch <context_name>]

Syntax Description

mac-address	-	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	-	Displays the wildcard MAC entries 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

Package Workgroup, Enterprise and Metro

Example

Single Instance

```
iss# show wildcard mac-address 00:11:22:33:00:00

Wild Card Entries:
------------------
        Mac Address           Ports
     ----------------   , -------------------
     00:11:22:33:00:00     Gi0/2
```

Multiple Instance

```
iss# show wildcard mac-address 00:55:66:77:00:00

Switch default

Switch deafult

Switch sw1

Wild Card Entries:
```

```
------------------
        Mac Address           Ports
     ---------------  , -------------------
     00:55:66:77:00:00    Gi0/3
```

☞ This command can be executed in the switch, only if the VLAN switching feature is started and enabled in the switch.

Related Commands

- **`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.

28.73 shutdown garp

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 to register and de-register attribute values, which are disseminated into the backbone of the GARP participants.

shutdown garp

no shutdown garp

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults GARP module is started and enabled in the switch on all ports.

Example

```
iss(config)# shutdown garp
```

- 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.

Related Command

- **base bridge-mode** - Configures the 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.
- **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.

28.74 set gvrp

This command globally enables or disables GVRP feature on all ports of a switch.

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.

```
set gvrp { enable | disable }
```

Syntax Description

enable	-	Enables GVRP feature in the switch on all ports and also starts the GARP in the switch if the GARP is disabled.
disable	-	Disables GVRP feature in the switch on all ports.

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults enable

Example

```
iss(config)# set gvrp disable
```

- GVRP feature can be globally enabled, only if VLAN feature is globally enabled in the switch.
- GVRP feature should be globally disabled before globally disabling the VLAN feature in the switch.
- 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.

Related Commands

- **spanning-tree mode** - Sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality 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).
- **base bridge-mode dot1q-vlan** - Configures the VLAN operation mode as VLAN aware bridging.
- **shutdown garp** - Shuts down the GARP module in the switch on all ports and releases all memories used for the GARP module.
- **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.

28.75 set port gvrp

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.

```
set port gvrp <interface-type> <interface-id> { enable | disable }
```

Syntax Description

<interface-type>	-	Configures the GVRP feature 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. • 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.
<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 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.
enable	-	Enables GVRP feature on the specified interface.
disable	-	Disables GVRP feature on the specified interface.

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults enable

Example

```
iss(config)# set port gvrp gigabitethernet 0/1 disable
```

- The GVRP feature can be configured on the specified interface, only if the GARP module is not shutdown.
- 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.

Related Command

- **`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.

28.76 set port gvrp - enable | disable

This command enables or disables GVRP (GARP VLAN Registration Protocol) on the interface.

This command operates similar to that of the command set port gvrp.

`set port gvrp { enable | disable } <interface-id>`

Syntax Description	**`enable`**	-	Enables GVRP on the interface
	`disable`	-	Disables GVRP on the interface
	`interface-id`	-	Interface identifier
Mode	Global Configuration Mode		
Package	Workgroup, Enterprise and Metro		
Defaults	enable		
Example	`iss(config)# set port gvrp disable 0/1`		

☞
- The value enable indicates that GVRP is enabled on the current port, as long as global GVRP status is also enabled for the device
- 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

Related Command
- **`show vlan port config`** - Displays the vlan related parameters specific for ports

28.77 set gmrp

This command globally enables or disables GMRP feature on all ports of a switch.

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.

```
set gmrp { enable | disable }
```

Syntax Description

enable	-	Enables GMRP feature in the switch on all ports and also starts the GARP in the switch if the GARP is disabled..
disable	-	Disables GMRP feature in the switch on all ports.

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults enable

Example

```
iss(config)# set gmrp disable
```

- GMRP feature can be globally enabled, only if VLAN feature is globally enabled in the switch.
- GMRP feature should be globally disabled before globally disabling the VLAN feature in the switch.
- GMRP feature cannot be configured in the switch, if the base bridge mode is set as transparent bridging the VLAN switching feature is shutdown in the switch.

Related Commands

- **ipv6 mld snooping** – Enables MLD snooping in the switch for a VLAN.
- **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).
- **base bridge-mode dot1q-vlan** - Configures the VLAN operation mode as VLAN aware bridging.
- **shutdown garp** - Shuts down the GARP module in the switch on all ports and releases all memories used for the GARP module.
- **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.

28.78 set port gmrp

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.

```
set port gmrp <interface-type> <interface-id> { enable | disable }
```

Syntax Description

`<interface-type>`	-	Configures the GMRP feature 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. • 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.
`<interface-id>`	-	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 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.
`enable`	-	Enables GMRP feature on the specified interface.
`disable`	-	Disables GMRP feature on the specified interface.

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults enable

Example

```
iss(config)# set port gmrp gigabitethernet 0/1 disable
```

- The GMRP feature can be configured on the specified interface, only if the GARP module is not shutdown.
- 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.

Related Command

- **`no shutdown garp`** - Starts and enables the GARP module in the switch on all ports.
- **`show vlan port config`** - Displays the VLAN related port specific information for all interfaces available in the switch / all contexts.

28.79 set garp timer

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.

```
set garp timer {join | leave | leaveall} <time in milli seconds>
```

Syntax 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 participant You can set the value as 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 participant You can set the value as 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:

- De-registering all registered attributes
- Re-registering all attributes with each of the participants

You can set the value as multiple of tens only (that is, as 10010, 10020 and so on).

The leaveall time should be greater than 0 and greater than GarpLeaveTime.

Mode Interface Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults

join	-	200
leave	-	600
leaveall	-	10000

Example

```
iss(config-if)# set garp timer join 250
```

- The GARP timers cannot be set as zero.
- The GARP timers can be configured, only if the GARP module is not shutdown.

Related Command

- **`no shutdown garp`** - Starts and enables the GARP module in the switch on all ports.
- **`show garp timer`** - Displays the GARP timer information of all interfaces available in the switch / all contexts.

28.80 vlan restricted

This command configures the restricted VLAN registration feature in a port. This feature configures the dynamic registration of VLAN.

vlan restricted {enable | disable}

Syntax Description	**enable**	-	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.
	disable	-	Disables restricted VLAN registration feature in the port. The creation or modification of a dynamic VLAN entry is permitted for all VLANs.

Mode Interface Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults disable

Example

```
iss(config-if)# vlan restricted enable
```

☞ The restricted VLAN registration feature can be configured in the port, only if the GARP module is started and enabled in the switch.

Related Command

- **no shutdown garp** - Starts and enables the GARP module in the switch on all ports.
- **show vlan port config** - Displays the VLAN related port specific information for all interfaces available in the switch / all contexts.

28.81 group restricted

This command configures the restricted group registration feature in a port. This feature enables you to restrict the multicast groups learnt through GMRP learning.

```
group restricted {enable | disable }
```

Syntax Description

enable	-	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.
disable	-	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.

Mode Interface Configuration Mode

Package Workgroup, Enterprise and Metro

Defaults disable

Example

```
iss(config-if)# group restricted enable
```

☞ The restricted group registration feature can be configured in the port, only if the GARP module is started and enabled in the switch.

Related Command

- **no shutdown garp** - Starts and enables the GARP module in the switch on all ports.
- **show vlan port config** - Displays the VLAN related port specific information for all interfaces available in the switch / all contexts.

28.82 debug garp

This command enables the tracing of the GARP submodule 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 submodule 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.

```
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>] }
```

Syntax 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.
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	-	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.

Mode Privileged Exec Mode

Package Workgroup, Enterprise and Metro

Defaults Tracing of the GARP submodule is disabled.

Example

```
iss # debug garp gvrp all
```

☞ The GARP submodule tracing can be configured in the switch, only if the GARP module is started and enabled in the switch on all ports.

Related Command

- **`no shutdown garp`** - Starts and enables the GARP module in the switch on all ports.
- **`show debugging`** - Displays state of each debugging option.

28.83 show garp timer

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.

```
show garp timer [{ port <interface-type> <interface-id> | switch
<context_name>}]
```

Syntax Description

`port` - Displays the GARP timer information of the specified interface.

The details to be provided are:

- <interface-type> - Sets the type of interface. The interface can be:

1. 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.
2. gigabitethernet – A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
3. extreme-ethernet – A version of Ethernet that supports data transfer up to 10 Gigabits per second. This Ethernet supports only full duplex links.
4. internal-lan – Internal LAN created on a bridge per IEEE 802.1ap.
5. 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 internal-lan and port-channel. Only i-lan or port-channel ID is provided, for interface types internal-lan and port-channel.

`switch` - 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 whose maximum size is 32.

This parameter is specific to multiple instance feature.

Mode Privileged EXEC Mode

Package Workgroup, Enterprise and Metro

Example **Single Instance:**

```
iss# 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
```

Multiple Instance:

```
iss# show garp timer
Switch - default

Garp Port Timer Info (in milli seconds)
---------------------------------------

Port      Join-time      Leave-time      Leave-all-time
-----     ---------      ----------      --------------
Gi0/49    200            600             10000

Switch - cust1

Garp Port Timer Info (in milli seconds)
---------------------------------------

Port      Join-time      Leave-time      Leave-all-time
-----     ---------      ----------      --------------
Gi0/1     200            600             10000
Gi0/2     200            600             10000
Gi0/3     200            600             10000
Gi0/4     200            600             10000
Gi0/5     200            600             10000
Gi0/6     200            600             10000
```

☞ 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.

Related Commands

- **`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.

28.84 multicast-mac limit

This command configures multicast MAC limit. The no form of the command configures Multicast MAC limit to the default value.

multicast-mac limit <size(0-4294967295)>

no multicast-mac limit

Mode	Global Configuration Mode
Package	Metro
Defaults	The Default value varies with target.
Example	`iss(config)# multicast-mac limit 10`
Related Command	• **show multicast-mac limit** - Displays multicast MAC limit

28.85 dot1x-tunnel-address

This command configures the destination MAC address to be used in tunneled DOT1X PDUs.

dot1x-tunnel-address <aa:aa:aa:aa:aa:aa>

Syntax Description	**aa:aa:aa:aa:aa:aa**	-	Multicast MAC Address
Mode	Global Configuration Mode		
Package	Metro		
Defaults	01:00:0c:cd:cd:d3		
Example	`iss(config)# dot1x-tunnel-address 01:00:00:00:22:22`		

☞
- Dot1x tunneling must be enabled for the dot1x tunnel address to be effective.

Related Command
- **show l2protocol tunnel-mac-address** - Displays the tunnel MAC address configured for Layer 2 protocols

28.86 lacp-tunnel-address

This command configures the destination MAC address to be used in tunneled LACP PDUs.

lacp-tunnel-address <aa:aa:aa:aa:aa:aa>

Syntax Description	**aa:aa:aa:aa:aa:aa**	-	Multicast MAC address
Mode	Global Configuration Mode		
Package	Metro		
Defaults	01:00:0c:cd:cd:d4		
Example	`iss(config)# lacp-tunnel-address 01:00:00:00:22:22`		

☞ LACP tunneling must be enabled for the LACP tunnel address to be effective.

Related Command

- **show l2protocol tunnel-mac-address** - Displays the tunnel MAC address configured for Layer 2 protocols

28.87 stp-tunnel-address

This command configures the destination MAC address to be used in tunneled STP BPDUs.

stp-tunnel-address <aa:aa:aa:aa:aa:aa>

Syntax Description	**aa:aa:aa:aa:aa:aa**	-	Multicast MAC Address
Mode	Global Configuration Mode		
Package	Metro		
Defaults	01:00:0c:cd:cd:d0		
Example	`iss(config)# stp-tunnel-address 01:00:00:00:22:22`		
☞	STP tunneling must be enabled to make this address effective.		
Related Command	• **show l2protocol tunnel-mac-address** - Displays the tunnel MAC address configured for Layer 2 protocols		

28.88 gvrp-tunnel-address

This command configures the destination MAC address to be used in tunneled GVRP PDUs.

gvrp-tunnel-address <aa:aa:aa:aa:aa:aa>

Syntax Description	**aa:aa:aa:aa:aa:aa**	-	Multicast MAC Address
Mode	Global Configuration Mode		
Package	Metro		
Defaults	01:00:0c:cd:cd:d1		
Example	`iss(config)# gvrp-tunnel-address 01:00:00:00:22:22`		
☞	GMRP tunneling must be enabled to make this address effective.		
Related Command	• **show l2protocol tunnel-mac-address** - Displays the tunnel MAC address configured for Layer 2 protocols		

28.89 gmrp-tunnel-address

This command configures the destination MAC address to be used in tunneled GMRP PDUs.

gmrp-tunnel-address <aa:aa:aa:aa:aa:aa>

Syntax Description	**aa:aa:aa:aa:aa:aa**	-	Multicast MAC Address
Mode	Global Configuration Mode		
Package	Metro		
Defaults	01:00:0c:cd:cd:d2		
Example	`iss(config)# gmrp-tunnel-address 01:00:00:00:22:22`		
☞	GMRP tunneling must be enabled to make this address effective.		
Related Command	• **show l2protocol tunnel-mac-address** - Displays the tunnel MAC address configured for Layer 2 protocols		

28.90 bridge-mode

This command configures the bridge mode of the Switch.

bridge-mode {customer | provider | provider-core | provider-edge | provider-backbone-icomp |provider-backbone-bcomp}

Syntax Description	**customer**	-	Customer Bridge Mode
	provider	-	Provider Bridge Mode
	provider-core	-	Provider core Bridge Mode
	provider-edge	-	Provider edge Bridge Mode
	provider-backbone-icomp	-	Provider Backbone Bridge I component Mode
	provider-backbone-bcomp	-	Provider Backbone Bridge B component Mode

Mode Global Configuration Mode in SI mode/Switch Configuration Mode in MI mode

Package Workgroup, Enterprise and Metro

In the Workgroup and the Enterprise package, only the **customer** and **provider** are the valid parameters.

Defaults Based on the bridge mode value in issnvram.txt

Example

```
iss(config)#  bridge-mode provider-backbone-icomp
```

- Only one bridge mode can be set at a time. If multiple bridge modes are required, multiple instances of the bridge should be run.
- To configure the bridge mode of the switch.
  - Spanning tree must be shut down.
  - GARP must be shut down.
  - ECFM must be shutdown

Related Command

- **no shutdown mrp** - Starts MRP module in the switch
- **show vlan device info** - Displays the VLAN related global status variables

28.91 l2protocol-tunnel cos

This command configures the priority for the tunneled STP BPDUs. The no form of the command configures the default priority for the tunneled STP BPDUs.

l2protocol-tunnel cos <cos-value(0-7)>

no l2protocol-tunnel cos

Mode	Global Configuration Mode
Package	Workgroup, Enterprise and Metro
Defaults	cos - value - 7
Example	`iss(config)# l2protocol-tunnel cos 5`
☞	The configured priority value will be effective only when the L2 Protocol tunnel STP is enabled on an interface
Related Command	• **show l2protocol-tunnel** - Displays the entries in VLAN tunnel protocol table containing the number of ingress or egress STP BPDUs tunneled

28.92 clear l2protocol-tunnel counters

This command clears the L2 protocol tunnel counters.

```
clear l2protocol-tunnel counters [<interface-type> <interface-id>]
```

Syntax Description	**interface-type**	-	Type of interface
	interface-id	-	Interface ID

Mode Global Configuration Mode

Package Workgroup, Enterprise and Metro

Example

```
iss(config)# clear l2protocol-tunnel counters
```

☞ If executed without the optional parameters this command clears the STP tunnel counters of all the available interfaces.

Related Command

- **show l2protocol-tunnel** - Displays the entries in VLAN tunnel protocol table containing the number of ingress or egress STP BPDUs tunneled

28.93 switchport dot1q customer vlan

This command sets the customer VLAN ID for the port.

switchport dot1q customer vlan <vlan-id(1-4094)>

Mode	Interface Configuration Mode
Package	Metro
Defaults	vlan-id - 0
Example	`iss(config-if)# switchport dot1q customer vlan 10`

☞
- The **switchport dot1q customer vlan** must be enabled, prior to the execution of this command.
- This configuration is not applicable for Customer Network Port Type and Provider Network Port Type.

Related Commands
- **switchport dot1q customer vlan – Status** - Enables / disables Customer VLAN classification
- **show [provider-bridge] port config** - Displays Service VLAN port information

28.94 switchport dot1q customer vlan – Status

This command enables / disables Customer VLAN classification.

`switchport dot1q customer vlan { enable | disable}`

Syntax Description	**`enable`**	-	Enables Customer VLAN classification
	`disable`	-	Disables Customer VLAN classification
Mode	Interface Configuration Mode		
Package	Metro		
Defaults	disable		
Example	`iss(config-if)# switchport dot1q customer vlan enable`		
Related Commands	• **`switchport dot1q customer vlan`** - Sets customer VLAN ID for the port • **`show [provider-bridge] port config`** - Displays Service VLAN port information		

28.95 switchport customer-vlan

This command configures an entry in the C-VID registration table and the no form of the command deletes entry in the C-VID registration table.

switchport customer-vlan < vlan-id (1-4094)> service-vlan < vlan-id (1-4094)> [untagged-pep {true|false}][untagged-cep {true|false}]

no switchport customer-vlan < vlan-id (1-4094)>

Syntax Description	**service vlan**		Service VLAN ID
	untagged-pep	-	Sets Untagged Provider Edge Port to true/false
	untagged-cep	-	Sets Untagged Customer Edge Port to true/false
Mode	Interface Configuration Mode		
Package	Metro		
Defaults	untagged-pep	-	false
	untagged-cep	-	false

Example

```
iss(config-if)# switchport customer-vlan 4 service-vlan 5
```

☞ Port must be customer edge port

Related Command

- **show service vlan** – Displays Service VLAN configuration

28.96 switchport service vlan

This command configures the Service VLAN assignment for the incoming packet based on various criteria such as source MAC, destination MAC, customer VLAN Id, source IP, destination IP and DSCP. The no form of the command deletes the given Service VLAN Classification entry.

```
switchport service vlan < vlan-id (1-4094)> { [ customer vlan < vlan-id (1-
4094)> { SrcMac <ucast_mac> | DstMac<ucast_mac> | Dscp <integer (0-63)> |
DstIp <ip_addr> } ] | SrcMac <ucast_mac> | DstMac <ucast_mac> | dscp <integer
(0-63)> | SrcIp <ucast_addr> [ DstIp <ip_addr> ] | DstIp <ip_addr> }
```

```
no switchport service vlan < vlan-id (1-4094)> { [ customer vlan < vlan-id (1-
4094)> { SrcMac <ucast_mac> | DstMac<ucast_mac> | Dscp <integer (0-63)> |
DstIp <ip_addr> } ] | SrcMac <ucast_mac> | DstMac <ucast_mac> | dscp <integer
(0-63)> | SrcIp <ucast_addr> [ DstIp <ip_addr> ] | DstIp <ip_addr> }
```

Syntax Description

customer vlan		Customer VLAN ID
SrcMac	-	Source MAC Address
DstMac	-	Destination MAC Address
Dscp	-	DSCP value
SrcIp	-	Source IP Address
DstIp	-	Destination IP Address

Mode Interface Configuration Mode

Package Metro

Defaults Default SVLAN assignment is based on PVID

Example

```
iss(config-if)# switchport service vlan 3 customer vlan 2
SrcMac 00:01:02:03:04:05
```

☞ The command **switchport service vlan classify** must be configured, prior to the execution of this command.

Related Commands

- **switchport service vlan classify** - Configures the Service VLAN classification method used for the port

- **`show service vlan`** - Displays Service VLAN configuration

28.97 switchport service vlan classify

This command configures the Service VLAN classification method used for the port. The no form of the command configures a default service VLAN classification method used for the port.

```
switchport service vlan classify {srcMac | dstMac | cvlanSrcMac | cvlanDstMac
| dscp | cvlanDscp | srcIp | dstIp | srcIpDstIp | cvlanDstIp }
```

```
no switchport service vlan classify
```

Syntax Description	**srcMac**	-	Source MAC based Service VLAN classification
	dstMac	-	Destination MAC based Service VLAN classification
	cvlanSrcMac	-	Customer VLAN and Source MAC based Service VLAN classification
	cvlanDstMac	-	Customer VLAN and Destination MAC based Service VLAN classification
	dscp	-	DSCP based Service VLAN classification
	cvlanDscp	-	Customer VLAN and DSCP based Service VLAN classification
	srcIp	-	Source IP based Service VLAN classification
	dstIp	-	Destination IP based Service VLAN classification
	srcIpDstIp	-	Source IP and Destination IP based Service VLAN classification
	cvlanDstIp	-	Customer VLAN and Destination IP based Service VLAN classification

Mode	Interface Configuration Mode
Package	Metro

Defaults

- Default Classification Method for Customer Edge Port Type: Customer Vlan
- Default Classification Method for Provider Network Port Type and Customer Network Port Type : PVID

Example

```
iss(config-if)# switchport service vlan classify srcMac
```

Related Commands

- **`switchport service vlan`**- Configures the Service VLAN assignment for the incoming packet based on different criteria
- **`show service vlan`** - Displays Service VLAN configuration
- **`show [provider-bridge] port config`** - Displays Service VLAN port information

28.98 switchport unicast-mac learning

This command enables / disables unicast-MAC learning for the port.

```
switchport unicast-mac learning { enable | disable }
```

Syntax Description	**enable**	-	Enables unicast-MAC learning for the port
	disable	-	Disables unicast-MAC learning for the port

Mode Interface Configuration Mode

Package Metro

Defaults enable

Example

```
iss(config-if)# switchport unicast-mac learning enable
```

Related Command

- **show [provider-bridge] port config** - Displays Service VLAN port information

28.99 switchport unicast-mac learning limit

This command configures port unicast MAC learning limit. The no form of the command resets port unicast MAC limit.

switchport unicast-mac learning limit <size(0-4294967295)>

no switchport unicast-mac learning limit

Mode	Interface Configuration Mode
Package	Metro
Defaults	Default value varies with target.
Example	`iss(config-if)# switchport unicast-mac learning limit 100`
Related Command	• **show [provider-bridge] port config** - Displays Service VLAN port information

28.100 switchport dot1q

This command configures port Ingress/Egress ether-type. The no form of the command resets port Ingress/Egress ether-type.

switchport dot1q { ingress | egress } ether-type <size(1-65535)>

no switchport { ingress | egress } dot1q ether-type

Syntax Description	**ingress**	-	Ingress ether-type
	egress	-	Egress ether-type
Mode	Interface Configuration Mode		
Package	Metro		
Defaults	34984		
Example	`iss(config-if)# switchport dot1q ingress ether-type 100`		
Related Command	• **show [provider-bridge] port config** - Displays Service VLAN port information		

28.101 set switchport ether-type swap

This command enables / disables ether type swapping.

```
set switchport ether-type swap { enable | disable }
```

Syntax Description	**enable**	-	Enables ether type swapping
	disable	-	Disables ether type swapping

Mode Interface Configuration Mode

Package Metro

Defaults disable

Example

```
iss(config-if)# set switchport ether-type swap enable
```

☞ Ethertype swapping is applicable for only network ports. It is done for S-Tag and B-Tag when these are either the outermost or the first level encapsulated tags for the ports in the PB or PBB bridge mode. The enable / disable for the ether type swapping is common, that is, it is not tag specific. The list of the allowed ether type swapping on ports is given in the below mentioned table.

Port Type	Description
CNP S-tagged	S-Tag Ethertype
PNP	B-Tag/ S-Tag Ethertype

Related Command

- **show [provider-bridge] port config** - Displays Service VLAN port information

28.102 set switchport [service] vlan swap

This command enables / disables VLAN swapping on a port.

```
set switchport [service] vlan swap { enable | disable }
```

Syntax Description

enable	-	Enables VLAN swapping
disable	-	Disables VLAN swapping

Mode Interface Configuration Mode

Package Metro

Defaults enable

Example

```
iss(config-if)# set switchport service vlan swap enable

iss(config-if)# set switchport vlan swap enable
```

☞ VLAN swapping is done for C-VLAN, S- VLAN and B-VLAN tags for the ports in PB/PBB bridge mode. The enable / disable for the VLAN swapping is common, that is. it is not tag specific. The list of the allowed VLAN swapping on ports is given in the below mentioned table.

Port Type	Description
CNP S-tagged	S-VLAN and C-VLAN
CNP C-tagged	C-VLAN
PNP	B-VLAN/ S-VLAN

Related Commands

- **show [service] vlan mapping** - Displays service vlan translation information

28.103 switchport [service] vlan mapping

This command configures a VLAN translation entry for the port. The no form of the command deletes a VLAN translation entry from the port.

```
switchport [service] vlan mapping <local vlan integer(1-4094)> <relay vlan integer(1-4094)>
```

```
no switchport [service] vlan mapping <vlan integer(1-4094)>
```

Syntax Description

local vlan integer	-	Value of the VLAN ID outside (sent/received) the bridge.
relay vlan integer	-	Value of the VLAN ID towards the relay entity of the bridge, that is. the VLAN ID value used inside the bridge.
vlan	-	Local VLAN ID value in the no form of the command to delete the entry.

Mode Interface Configuration Mode

Package Metro

Example

```
iss(config-if)# switchport vlan mapping 100 200
```

☞

- VLAN translation is done by the ports, when it is enabled. If it is disabled or it is enabled, but there is no entry for the received VLAN-ID, then no translation is done.
- VLAN translation is done for outermost and the first level encapsulated tags at the ports in PB/PBB bridge mode. The list of the allowed VLAN swapping on ports in PB/PBB bridge mode is given in the below mentioned table.

Port Type	Description
CNP S-tagged	S-VLAN
CNP C-tagged	C-VLAN
PNP	B-VLAN

- Outermost tags for ports are defined in the below mentioned table.

Port Type	Outermost tag
CNP S-tagged	S-Tag
CNP C-tagged	C-Tag
PNP	B-Tag

- All other tables, having references to the VLAN ID in the bridge, contain the Relay VLAN and not the local VLAN.

Related Command

- **show [service] vlan mapping** - Displays service vlan translation information

28.104 l2protocol-tunnel

This command enables the tunneling of L2 protocols on this port. The no form of the command sets the option to discard L2 protocols received on this port.

```
l2protocol-tunnel {dot1x | lacp | stp | gvrp | gmrp| igmp}
```

```
no l2protocol-tunnel {dot1x | lacp | stp | gvrp | gmrp| igmp}
```

Syntax Description

dot1x	-	Dot1x PDUs
lacp	-	LACP PDUs
stp	-	STP BPDUs
gvrp	-	GVRP BPDUs
gmrp	-	GMRP BPDUs
igmp	-	IGMP Packets

Mode Interface Configuration Mode

Package Metro

Defaults Based on the port type

Example

```
iss(config-if)# l2protocol-tunnel dot1x
```

☞

- To enable L2 protocol tunneling, the port must be customer edge port / customer network port / proprietary customer edge port / proprietary customer network port/access port.
- Refer VLAN Configuration User manual for restrictions in this command.

Related Command

- **show [provider-bridge] port config** – Displays Service VLAN port information

28.105 l2protocol-peer

This command enables peering of L2 protocols on this port.

```
l2protocol-peer {dot1x | lacp | stp | gvrp | gmrp| igmp}
```

Syntax Description	**dot1x**	-	Dot1x PDUs
	lacp	-	LACP PDUs
	stp	-	STP BPDUs
	gvrp	-	GVRP BPDUs
	gmrp	-	GMRP BPDUs
	igmp	-	IGMP Packets

Mode Interface Configuration Mode

Package Metro

Defaults Based on port type

Example

```
iss(config-if)# l2protocol-peer lacp
```

☞

- To enable L2 protocol peering, the port must be customer edge port / customer network port / proprietary customer edge port / proprietary customer network port/access port.
- Refer VLAN Configuration User manual for restrictions in this command.

Related Command

- **show [provider-bridge] port config** – Displays Service VLAN port information

28.106 l2protocol-discard

This command sets the option to discard L2 protocols received on this port.

`l2protocol-discard {dot1x | lacp | stp | gvrp | gmrp| igmp}`

Syntax Description	**`dot1x`**	-	Dot1x PDUs
	`lacp`	-	LACP PDUs
	`stp`	-	STP BPDUs
	`gvrp`	-	GVRP BPDUs
	`gmrp`	-	GMRP BPDUs
	`igmp`	-	IGMP Packets

Mode Interface configuration mode

Package Metro

Defaults Based on the port type

Example

```
iss(config-if)# l2protocol-discard gvrp
```

☞

- To enable L2 protocol discard, the port must be customer edge port / customer network port / proprietary customer edge port / proprietary customer network port / access port.
- Refer VLAN Configuration User manual for restrictions in this command.

Related Command

- **`show [provider-bridge] port config`** – Displays Service VLAN port information

28.107 service-vlan

This command sets the PVID for the provider edge port.

service-vlan <vlan-id (1-4094)> pvid <vlan-id(1-4094)>

Syntax Description	**vlan-id**	- Service VLAN Id
	pvid	- Customer VLAN Id
Mode	Interface Configuration mode	
Package	Metro	
Defaults	**pvid**	– By Default, PVID of this Provider Edge Port is taken from the CVID RegistrationTable for this SVLAN.
Example	`iss(config-if)# service-vlan 2 pvid 3`	
☞	There must be an entry in CVID registration table for this Service VLAN using the **switchport customer-vlan** command.	
Related Commands	• **show provider-bridge pep configuration** – Displays the provider edge port configuration	

28.108 service-vlan acceptable-frame-type

This command sets the acceptable frame type value for the provider edge port. The no form of the command resets the acceptable frame type value for the provider edge port to default value.

service-vlan <vlan-id (1-4094)> acceptable-frame-type { all | tagged | untaggedandprioritytagged}

no service-vlan <vlan-id (1-4094)> acceptable-frame-type

Syntax Description	**vlan-id**	-	VLAN Id
	all	-	All acceptable frame types
	tagged	-	Tagged frames
	untaggedandprioritytagged	-	Untagged and Priority Tagged Frames
Mode	Interface Configuration mode		
Package	Metro		
Defaults	acceptable-frame-type	-	all
Example	`iss(config-if)# service-vlan 2 acceptable-frame-type tagged`		

☞ There must be an entry in CVID registration table for this Service VLAN using the **switchport customer-vlan** command.

Related Command

- **show provider-bridge pep configuration –** Displays the provider edge port configuration

28.109 service-vlan ingress-filter

This command enables/disables the Ingress Filtering for the provider edge port. The no form of the command sets the Ingress Filtering value for the provider edge port to default value.

service-vlan <vlan-id (1-4094)> ingress-filter { enable | disable }

no service-vlan <vlan-id (1-4094)> ingress-filter

Syntax Description	**vlan-id**	-	Service VLAN Id
	enable	-	Enables the Ingress Filtering
	disable	-	Disables the Ingress Filtering
Mode	Interface configuration mode		
Package	Metro		
Defaults	**ingress-filter** disable		
Example	`iss(config-if)# service-vlan 5 ingress-filter enable`		

☞ There must be an entry in CVID registration table for this Service VLAN using the **switchport customer-vlan** command.

Related Command

- **show provider-bridge pep configuration** - Displays the provider edge port configuration

28.110 service-vlan def-user-priority

This command sets the default user priority value for the provider edge port. The no form of the command sets the default user priority value for the provider edge port to default value.

```
service-vlan <vlan-id (1-4094)> def-user-priority < default user priority (0-7)>
```

```
no service-vlan <vlan-id (1-4094)> def-user-priority
```

Syntax Description	**vlan-id**	–	VLAN Identifier
	def-user-priority	–	Default user priority
Mode	Interface Configuration mode		
Package	Metro		
Defaults	def-user-priority	–	0
Example	`iss(config-if)# service-vlan 3 def-user-priority 2`		

☞ There must be an entry in CVID registration table for this Service VLAN using the **switchport customer-vlan** command.

Related Command

- **show provider-bridge pep configuration** – Displays the provider edge port configuration

28.111 service-vlan recv-priority

This command configures the regenerated priority for the received service priority for internal CNP (Customer Network Port). The no form of the command configures the default value for the received priority for internal CNP.

```
service-vlan <vlanid(1-4094)> recv-priority <received priority (0-7)> regen-priority <regenerated priority (0-7)>
```

```
no service-vlan <vlanid(1-4094)> recv-priority <received priority(0-7)>
```

Syntax Description	**vlanid**	–	VLAN Identifier
	recv-priority	–	Priority assigned/retrieved from the packet
	regen-priority	–	Regenerated priority
Mode	Interface Configuration Mode		
Package	Metro		
Defaults	By default, recv-priority is equal to regen-priority		
Example	`iss(config-if)# service-vlan 3 recv-priority 2 regen-priority 4`		

☞ There must be an entry in CVID registration table for this Service VLAN using the **switchport customer-vlan** command.

Related Command

- **show provider-bridge pep configuration** – Displays the provider edge port configuration

28.112 service-vlan cos-preservation

This command enables/disables COS preservation for this service. The no form of the command sets the COS preservation value to default value for this service.

```
service-vlan <vlan-id (1-4094)> cos-preservation { enable | disable }
```

```
no service-vlan <vlan-id (1-4094)> cos-preservation
```

Syntax Description	**vlan-id**	–	VLAN Identifier
	cos-preservation	–	Preserves the COS and Vlan id in the incoming C-Tagged packet.

Mode Interface Configuration Mode

Package Metro

Defaults cos-preservation - disable

Example

```
iss(config-if)# service-vlan 4 cos-preservation enable
```

☞ There must be an entry in CVID registration table for this Service VLAN using the **switchport customer-vlan** command.

Related Command

- **show provider-bridge pep configuration** – Displays the provider edge port configuration

28.113 switchport [provider-bridge] require-drop-encoding

This command configures the required drop encoding parameter in the port.

switchport [provider-bridge] require-drop-encoding {true | false}

Syntax Description	**true**	–	Specifies that drop encoding is required
	false	–	Specifies that drop encoding is not required
Mode	Interface Configuration Mode		
Package	Metro		
Defaults	false		
Example	`iss(config-if)# switchport provider-bridge require-drop-encoding true` `iss(config-if)# switchport require-drop-encoding true`		
Related Command	• **show [provider-bridge] port config** - Displays Service VLAN port information		

28.114 switchport [provider-bridge] pcp-selection-row

This command configures the PCP selection row parameter in the port. This is used to select a row in PCP encoding and decoding table.

switchport [provider-bridge] pcp-selection-row {8POD|7P1D|6P2D|5P3D}

Syntax Description	**pcp-selection-row**	– Specifies the row to be used by the port in PCP encoding/decoding.
Mode	Interface Configuration Mode	
Package	Metro	
Defaults	8P0D	
Example	`iss(config-if)# switchport provider-bridge pcp-selection-row 7P1D` `iss(config-if)# switchport pcp-selection-row 7P1D`	
☞	Refer the Standard IEEE 802.1ad/d6 –section 6.7.3 for details on Priority Code point selection row.	
Related Command	• **show [provider-bridge] port config** - Displays Service VLAN port information	

28.115 switchport [provider-bridge] use-dei

This command configures the Use_DEI (DEI - Drop Eligible Indicator) parameter in the port.

`switchport [provider-bridge] use-dei {true | false}`

Syntax Description	**`true`**	- Sets Use_DEI to true
	`false`	- Sets Use_DEI to false
Mode	Interface Configuration mode	
Package	Metro	
Defaults	false	
Example	`iss(config-if)# switchport provider-bridge use-dei true` `iss(config-if)# switchport use-dei true`	
☞	Refer the Standard IEEE 802.1ad/d6 –section 12.6.2.13 for details on Use_DEI.	
Related Command	• **`show [provider-bridge] port config`** - Displays Service VLAN port information	

28.116 switchport mode dot1q-tunnel

This command enables dot1q-tunneling on the specified interface. The no form of the command disables dot1q-tunneling on the specified interface.

switchport mode dot1q-tunnel

no switchport mode dot1q-tunnel

Mode Interface Configuration Mode

Package Metro

Defaults Disabled

Example

```
iss(config-if)# switchport mode dot1q-tunnel
```

- Bridge Mode must be set to 'provider' for the dot1q-tunneling status to be enabled
- It is not possible to set the dot1q-tunnel status on the port if the port mode is not 'access' type
- PNAC port control must be force-authorized
- If dot1q tunneling is enabled on the specified interface, then GMRP is disabled internally

Related Commands

- **bridge-mode**- Configures the bridge to operate on customer or provider network
- **switchport mode** - Configures the VLAN port mode
- **show dot1q-tunnel** - Displays the entries in the dot1q-tunnel table
- **show vlan device info** - Displays the VLAN related global status variables
- **show vlan port config** - Displays the VLAN port information

28.117 service-type {e-line | e-lan}

This command configures the service type for a VLAN.

`service-type {e-line | e-lan}`

Syntax Description	**`e-line`**	Two points of customer attachments in the Provider Network
	`e-lan`	Multiple points of customer attachments in the Provider Network
Mode	Config-VLAN Mode	
Package	Metro	
Defaults	e-lan	
Example	`iss(config-vlan)# service-type e-line`	

☞ To configure the service type as

- e-line – there must be two member ports for a given service VLAN
- e-lan – No restriction on the number of member ports for a given service VLAN

Related Command

- **`show vlan brief`** - Displays the VLAN information in the database

28.118 show service vlan

This command displays Service VLAN configuration.

show service vlan [srcMac | dstMac | cvlanSrcMac | cvlanDstMac | dscp | cvlanDscp | srcIp | dstIp | srcIpDstIp | cvlanDstIp | cvlan | pvid] [switch <context_name>]

Syntax Description

srcMac	-	Source MAC based service VLAN
dstMac	-	Destination MAC based service VLAN
cvlanSrcMac	-	Customer VLAN and Source MAC based service VLAN
cvlanDstMac	-	Customer VLAN and Destination MAC based service VLAN
dscp	-	DSCP based service VLAN
cvlanDscp	-	Customer VLAN and DSCP based service VLAN
srcIp	-	Source IP Address based service VLAN
dstIp	-	Destination IP address based service VLAN
srcIpDstIp	-	Source IP and Destination IP based service VLAN
cvlanDstIp	-	Customer VLAN and Destination IP based service VLAN
cvlan	-	Customer VLAN based service VLAN
pvid	-	PVID based service VLAN
switch	-	Context/Switch Name. This parameter is specific to Multiple Instance.

Mode Privileged EXEC Mode

Package Metro

Example

```
Single Instance:
iss# show service vlan cvlan

Service Vlan Classification
-------------------------------
 Service Vlan     Port    Customer Vlan  Untag-pep  Untag-cep
 ------------------------------------------------------------
 2               Gi0/1     1               False       False

iss# show service vlan

Service Vlan Classification
-------------------------------
 Service Vlan     Port    Customer Vlan  Untag-pep  Untag-cep
 ------------------------------------------------------------
 2               Gi0/1     1               False       False
```

```
 Service Vlan     Port    pvid
 ------------------------------------------------------------
 1               Gi0/1    1
 1               Gi0/2    1
 1               Gi0/3    1
 1               Gi0/4    1
 1               Gi0/5    1
 1               Gi0/6    1
 1               Gi0/7    1

Multiple Instance:
iss# show service vlan

Switch - default

Service Vlan Classification
-------------------------------
 Service Vlan     Port    Customer Vlan  Untag-pep  Untag-cep
 ------------------------------------------------------------
 2               Gi0/1     1                False       False
 Service Vlan     Port    pvid
 ------------------------------------------------------------
 1               Gi0/1    1
 1               Gi0/2    1
 1               Gi0/3    1
 1               Gi0/4    1
 1               Gi0/5    1
 1               Gi0/6    1
 1               Gi0/7    1

iss# show service vlan cvlan

Switch - default

Service Vlan Classification
-------------------------------
 Service Vlan     Port    Customer Vlan  Untag-pep  Untag-cep
 ------------------------------------------------------------
 2               Gi0/1     1                False       False
```

☞ If executed without the optional parameters this command displays all service VLAN configuration.

Related Commands

- **`switchport customer-vlan`**- configures the Service VLAN assignment for the incoming packet based on different criteria
- **`switchport service vlan classify`** - Configures the Service VLAN classification method used for the port

28.119 show [service] vlan mapping

This command displays service vlan translation information. If the interface is specified then the information of that specific interface is displayed, else the information of all the interfaces is displayed.

show [service] vlan mapping [{port <interface-type> <interface-id> | switch <context_name>}]

Syntax Description

interface-type	-	Interface Type
interface-id	-	Interface ID
switch	-	Context/Switch Name. This parameter is specific to Multiple Instance.

Mode Privileged EXEC Mode

Package Metro

Example

```
iss# show vlan mapping gigabitethernet 0/7

VLAN mapping
------------------------
Port Gi0/7
--------------
Type              Local VLAN            Relay VLAN
C                    10                    5
S                    10                    5
B                    10                    5
```

☞ If executed without the optional parameters this command displays the service vlan mapping configuration for all the available interfaces.

Related Commands

- **switchport [service] vlan mapping** - Configures a S-VLAN translation entry for the port
- **set switchport [service] vlan swap** - Enables / disables service VLAN swapping

28.120 show ethertype mapping

This command displays ethertype mapping information.

show ethertype mapping [port <interface-type> <interface-id>] [switch <context_name>]

Syntax Description	**interface-type**	-	Interface Type
	interface-id	-	Interface ID
	switch	-	Context/Switch Name. This parameter is specific to Multiple Instance.

Mode Privileged EXEC Mode

Package Metro

Example

```
Single Instance:
iss# show ethertype mapping

EtherType Mapping
-------------------------
Port Gi0/2
-----------
      Local EtherType     Relay EtherType
         0x1f40                 0x2710

Multiple Instance:
iss# show ethertype mapping

Switch - default

EtherType Mapping
-------------------------
Port Gi0/2
-----------
      Local EtherType     Relay EtherType
         0x64                 0x1f40
```

☞ If executed without the optional parameters this command displays the ethertype mapping configuration for all the available interfaces.

28.121 show [provider-bridge] port config

This command displays Service VLAN port information.

show [provider-bridge] port config [{port <interface-type> <interface-num> | switch <context_name>}]

Syntax Description	**interface-type**	-	Interface Type
	interface-num	-	Interface ID
	switch	-	Context/Switch Name. This parameter is specific to Multiple Instance.

Mode Privileged EXEC Mode

Package Metro

Example

```
Single Instance:
iss# show provider-bridge port config

Provider Bridge Port configuration table
----------------------------------------
Port Gi0/1
 Port Type                          : Customer Edge Port
 Dot1x Protocol Tunnel Status       : Peer
 LACP Protocol Tunnel Status        : Peer
 Spanning Tree Tunnel Status        : Peer
 GVRP Protocol Tunnel Status        : Discard
 GMRP Protocol Tunnel Status        : Discard
 IGMP Protocol Tunnel Status        : Discard
 Service Vlan Classification        : Customer Vlan
 Ingress EtherType                  : 0x88a8
 Egress EtherType                   : 0x8100
 EtherType Swap Status              : Disable
 Service Vlan Translation Status    : Disable
 Require Drop Encoding              : False
 Use_Dei                            : False
 PCP Selection Row                  : 8P0D
 Unicast Mac Learning Status        : Enable
 Unicast Mac Learning Limit         : 150
 Customer Vlan                      : 1
 Customer Vlan Status               : Enabled
---------------------------------------------------
Port Gi0/2
 Port Type                          : Customer Network
Port(Port-Based)
 Dot1x Protocol Tunnel Status       : Peer
 LACP Protocol Tunnel Status        : Peer
 Spanning Tree Tunnel Status        : Tunnel
 GVRP Protocol Tunnel Status        : Tunnel
```

```
 GMRP Protocol Tunnel Status          : Tunnel
 IGMP Protocol Tunnel Status          : Tunnel
 Service Vlan Classification          : PVID
 Ingress EtherType                    : 0x88a8
 Egress EtherType                     : 0x88a8
 EtherType Swap Status                : Disable
 Service Vlan Translation Status      : Disable
 Require Drop Encoding                : False
 Use_Dei                              : False
 PCP Selection Row                    : 8P0D
 Unicast Mac Learning Status          : Enable
 Unicast Mac Learning Limit           : 150
 ---------------------------------------------------
Port Gi0/3
 Port Type                            : Customer Network
Port(Stag-Based)
 Service Vlan Classification          : PVID
 Ingress EtherType                    : 0x88a8
 Egress EtherType                     : 0x88a8
 EtherType Swap Status                : Disable
 Service Vlan Translation Status      : Enable
 Require Drop Encoding                : False
 Use_Dei                              : False
 PCP Selection Row                    : 8P0D
 Unicast Mac Learning Status          : Enable
 Unicast Mac Learning Limit           : 150
 ---------------------------------------------------
Port Gi0/4
 Port Type                            : Prop Customer Edge Port
 Dot1x Protocol Tunnel Status         : Peer
 LACP Protocol Tunnel Status          : Peer
 Spanning Tree Tunnel Status          : Tunnel
 GVRP Protocol Tunnel Status          : Tunnel
 GMRP Protocol Tunnel Status          : Tunnel
 IGMP Protocol Tunnel Status          : Tunnel
 Service Vlan Classification          : PVID
 Ingress EtherType                    : 0x88a8
 Egress EtherType                     : 0x88a8
 EtherType Swap Status                : Disable
 Service Vlan Translation Status      : Disable
 Require Drop Encoding                : False
 Use_Dei                              : False
 PCP Selection Row                    : 8P0D
 Unicast Mac Learning Status          : Enable
 Unicast Mac Learning Limit           : 150
 Customer Vlan Status                 : Disabled
 ---------------------------------------------------
Port Gi0/5
 Port Type                            : Prop  Customer Network
Port
 Dot1x Protocol Tunnel Status         : Peer
 LACP Protocol Tunnel Status          : Peer
 Spanning Tree Tunnel Status          : Tunnel
 GVRP Protocol Tunnel Status          : Tunnel
 GMRP Protocol Tunnel Status          : Tunnel
 IGMP Protocol Tunnel Status          : Tunnel
 Service Vlan Classification          : PVID
```

```
 Ingress EtherType                    : 0x88a8
 Egress EtherType                     : 0x88a8
 EtherType Swap Status                : Disable
 Service Vlan Translation Status      : Disable
 Require Drop Encoding                : False
 Use_Dei                              : False
 PCP Selection Row                    : 8P0D
 Unicast Mac Learning Status          : Enable
 Unicast Mac Learning Limit           : 150
 Customer Vlan Status                 : Disabled
 ---------------------------------------------------
Port Gi0/6
 Port Type                            : Prop Provider Network
Port
 Service Vlan Classification          : PVID
 Ingress EtherType                    : 0x8100
 Egress EtherType                     : 0x8100
 EtherType Swap Status                : Disable
 Service Vlan Translation Status      : Disable
 Require Drop Encoding                : False
 Use_Dei                              : False
 PCP Selection Row                    : 8P0D
 Unicast Mac Learning Status          : Enable
 Unicast Mac Learning Limit           : 150
 Customer Vlan Status                 : Disabled
 ---------------------------------------------------
Port Gi0/7
 Port Type                            : Provider Network Port
 Service Vlan Classification          : PVID
 Ingress EtherType                    : 0x88a8
 Egress EtherType                     : 0x88a8
 EtherType Swap Status                : Disable
 Service Vlan Translation Status      : Enable
 Require Drop Encoding                : False
 Use_Dei                              : False
 PCP Selection Row                    : 8P0D
 Unicast Mac Learning Status          : Enable
 Unicast Mac Learning Limit           : 150
 ---------------------------------------------------

Multiple Instance:
iss# show provider-bridge port config

Switch - default

Provider Bridge Port configuration table
----------------------------------------
Port Gi0/1
 Port Type                            : Customer Edge Port
 Dot1x Protocol Tunnel Status         : Peer
 LACP Protocol Tunnel Status          : Peer
 Spanning Tree Tunnel Status          : Peer
 GVRP Protocol Tunnel Status          : Discard
 GMRP Protocol Tunnel Status          : Discard
 IGMP Protocol Tunnel Status          : Discard
 Service Vlan Classification          : Customer Vlan
 Ingress EtherType                    : 0x88a8
```

```
 Egress EtherType                    : 0x8100
 EtherType Swap Status               : Disable
 Service Vlan Translation Status     : Disable
 Require Drop Encoding               : False
 Use_Dei                             : False
 PCP Selection Row                   : 8P0D
 Unicast Mac Learning Status         : Enable
 Unicast Mac Learning Limit          : 150
 Customer Vlan                       : 1
 Customer Vlan Status                : Enabled
 ----------------------------------------------------
Port Gi0/2
 Port Type                           : Customer Network
Port(Port-Based)
 Dot1x Protocol Tunnel Status        : Peer
 LACP Protocol Tunnel Status         : Peer
 Spanning Tree Tunnel Status         : Tunnel
 GVRP Protocol Tunnel Status         : Tunnel
 GMRP Protocol Tunnel Status         : Tunnel
 IGMP Protocol Tunnel Status         : Tunnel
 Service Vlan Classification         : PVID
 Ingress EtherType                   : 0x88a8
 Egress EtherType                    : 0x88a8
 EtherType Swap Status               : Disable
 Service Vlan Translation Status     : Disable
 Require Drop Encoding               : False
 Use_Dei                             : False
 PCP Selection Row                   : 8P0D
 Unicast Mac Learning Status         : Enable
 Unicast Mac Learning Limit          : 150
 ----------------------------------------------------
Port Gi0/3
 Port Type                           : Customer Network
Port(Stag-Based)
 Service Vlan Classification         : PVID
 Ingress EtherType                   : 0x88a8
 Egress EtherType                    : 0x88a8
 EtherType Swap Status               : Disable
 Service Vlan Translation Status     : Enable
 Require Drop Encoding               : False
 Use_Dei                             : False
 PCP Selection Row                   : 8P0D
 Unicast Mac Learning Status         : Enable
 Unicast Mac Learning Limit          : 150
 ----------------------------------------------------
Port Gi0/4
 Port Type                           : Prop Customer Edge Port
 Dot1x Protocol Tunnel Status        : Peer
 LACP Protocol Tunnel Status         : Peer
 Spanning Tree Tunnel Status         : Tunnel
 GVRP Protocol Tunnel Status         : Tunnel
 GMRP Protocol Tunnel Status         : Tunnel
 IGMP Protocol Tunnel Status         : Tunnel
 Service Vlan Classification         : PVID
 Ingress EtherType                   : 0x88a8
 Egress EtherType                    : 0x88a8
 EtherType Swap Status               : Disable
```

```
 Service Vlan Translation Status     : Disable
 Require Drop Encoding               : False
 Use_Dei                             : False
 PCP Selection Row                   : 8P0D
 Unicast Mac Learning Status         : Enable
 Unicast Mac Learning Limit          : 150
 Customer Vlan Status                : Disabled
 ---------------------------------------------------
Port Gi0/5
 Port Type                           : Prop  Customer Network
Port
 Dot1x Protocol Tunnel Status        : Peer
 LACP Protocol Tunnel Status         : Peer
 Spanning Tree Tunnel Status         : Tunnel
 GVRP Protocol Tunnel Status         : Tunnel
 GMRP Protocol Tunnel Status         : Tunnel
 IGMP Protocol Tunnel Status         : Tunnel
 Service Vlan Classification         : PVID
 Ingress EtherType                   : 0x88a8
 Egress EtherType                    : 0x88a8
 EtherType Swap Status               : Disable
 Service Vlan Translation Status     : Disable
 Require Drop Encoding               : False
 Use_Dei                             : False
 PCP Selection Row                   : 8P0D
 Unicast Mac Learning Status         : Enable
 Unicast Mac Learning Limit          : 150
 Customer Vlan Status                : Disabled
 ---------------------------------------------------
Port Gi0/6
 Port Type                           : Prop Provider Network
Port
 Service Vlan Classification         : PVID
 Ingress EtherType                   : 0x8100
 Egress EtherType                    : 0x8100
 EtherType Swap Status               : Disable
 Service Vlan Translation Status     : Disable
 Require Drop Encoding               : False
 Use_Dei                             : False
 PCP Selection Row                   : 8P0D
 Unicast Mac Learning Status         : Enable
 Unicast Mac Learning Limit          : 150
 Customer Vlan Status                : Disabled
 ---------------------------------------------------
Port Gi0/7
 Port Type                           : Provider Network Port
 Service Vlan Classification         : PVID
 Ingress EtherType                   : 0x88a8
 Egress EtherType                    : 0x88a8
 EtherType Swap Status               : Disable
 Service Vlan Translation Status     : Enable
 Require Drop Encoding               : False
 Use_Dei                             : False
 PCP Selection Row                   : 8P0D
 Unicast Mac Learning Status         : Enable
 Unicast Mac Learning Limit          : 150
 ---------------------------------------------------
```

```
Port Gi0/8
 Port Type                              : Provider Instance Port
 Require Drop Encoding                  : False
 Use_Dei                                : False
 PCP Selection Row                      : 8P0D
-------------------------------------------------------
```

☞ If executed without the optional parameters this command displays the configuration for all the available interfaces.

Related Commands

- **`switchport dot1q customer vlan`** - Sets customer VLAN ID for the port
- **`switchport dot1q customer vlan – Status`** - Enables / disables Customer VLAN classification
- **`switchport service vlan classify`** - Configures the Service VLAN classification method used for the port
- **`switchport unicast-mac learning`** - Enables / disables unicast-mac learning for the port
- **`switchport unicast-mac learning limit`** - Configures port unicast MAC learning limit
- **`switchport dot1q`** - Configures port Ingress/Egress ether-type
- **`set switchport ether-type swap`** - Enables / disables ether type swapping
- **`set switchport [service] vlan swap`** - Enables / disables service VLAN swapping

28.122 show multicast-mac limit

This command displays the multicast MAC limit.

show multicast-mac limit [switch <context_name>]

Syntax Description	**switch**	-	Context/Switch Name. This parameter is specific to Multiple Instance.

Mode Privileged EXEC Mode

Package Metro

Example

```
Single Instance:
iss# show multicast-mac limit

Mulitcast Mac Limit                : 25

Multiple Instance:
iss# show multicast-mac limit switch 1
Switch - 1
Mulitcast Mac Limit                : 25
```

Related Commands

- **multicast-mac limit** - Configures multicast MAC limit

28.123 show l2protocol tunnel-mac-address

This command displays the tunnel MAC address configured for Layer 2 protocols.

show l2protocol tunnel-mac-address [switch <context_name>]]

Syntax Description	**switch**	- Context/Switch Name. This parameter is specific to Multiple Instance.
Mode	Privileged EXEC Mode	
Package	Metro	

Example

```
Single Instance:
iss# show l2protocol tunnel-mac-address


 VLAN tunnel MAC address
--------------------------
 Dot1x tunnel MAC address :  01:00:0c:cd:cd:d3
 LACP  tunnel MAC address :  01:00:0c:cd:cd:d4
  STP  tunnel MAC address :  01:00:0c:cd:cd:d0
 GVRP  tunnel MAC address :  01:00:0c:cd:cd:d1
 GMRP  tunnel MAC address :  01:00:0c:cd:cd:d2

Multiple Instance:
iss# show l2protocoltunnel-mac-address switch default

 VLAN tunnel MAC address
--------------------------
Switch - default
--------------------------
 Dot1x tunnel MAC address :  01:00:0c:cd:cd:d3
 LACP  tunnel MAC address :  01:00:0c:cd:cd:d4
  STP  tunnel MAC address :  01:00:0c:cd:cd:d0
 GVRP  tunnel MAC address :  01:00:0c:cd:cd:d1
 GMRP  tunnel MAC address :  01:00:0c:cd:cd:d2
```

Related Commands

- **dot1x-tunnel-address** – Configures the destination MAC address to be used in tunneled DOT1X PDUs
- **lacp-tunnel-address** – Configures the destination MAC address to be used in tunneled LACP PDUs
- **stp-tunnel-address** – Configures the destination MAC address to be used in tunneled STP BPDUs
- **gvrp-tunnel-address** – Configures the destination MAC address to be used in tunneled GVRP PDUs
- **gmrp-tunnel-address** – Configures the destination MAC address to be used in tunneled GMRP PDUs

28.124 show provider-bridge pep configuration

This command displays the provider edge port configuration.

show provider-bridge pep configuration [port <interface-type><interface-num>] [switch <context_name>]

Syntax Description	**switch**	- Context/Switch Name. This parameter is specific to Multiple Instance.
Mode	Privileged EXEC Mode	
Package	Metro	

Example

```
Single Instance:
iss# show provider-bridge pep configuration

Provider Edge Port configuration
------------------------------------

Port Gi0/1
 Service VLAN-ID                    : 2
 Port VLAN-ID                       : 1
 Acceptable Frame Type              : Admit all
 Ingress Filtering                  : Disabled
 Default Priority                   : 0
 Oper status                        : Up

Multiple Instance:
iss# show provider-bridge pep configuration switch default

Provider Edge Port configuration
------------------------------------
Switch - default


Port Gi0/1
 Service VLAN-ID                    : 1
 Port VLAN-ID                       : 2
 Acceptable Frame Type              : Admit all
 Ingress Filtering                  : Disabled
 Default Priority                   : 0
 Oper status                        : Down

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

Related Commands

- **service-vlan acceptable-frame-type** – Sets the acceptable frame type value for the provider edge port

- **`service-vlan ingress-filter`** – Enables/disables the Ingress Filtering for the provider edge port
- **`service-vlan def-user-priority`** – Sets the default user priority value for the provider edge port
- **`service-vlan recv-priority`** – Configures the regenerated priority for the received service priority for the internal CNP

28.125 show [provider-bridge] pcp encoding

This command displays PCP encoding table for all ports or for a specific port.

show [provider-bridge] pcp encoding [{port <interface-type> <interface-num> | switch <context_name>}]

Syntax Description	**interface-type**	-	Interface Type
	interface-num	-	Interface ID
	switch	-	Context/Switch Name. This parameter is specific to Multiple Instance.

Mode Privileged EXEC Mode

Package Metro

Example

```
Single Instance:
iss# show provider-bridge pcp encoding port fastethernet 0/1

Port Gi0/1
-----------
DropEligible: 0 0DE 1 1DE 2 2DE 3 3DE 4 4DE 5 5DE 6 6DE 7 7DE
Priority    :
-----------------------------------------------------------------
8POD        : 0  0  1  1  2  2  3  3  4  4  5  5  6  6  7  7
7P1D        : 0  0  1  1  2  2  3  3  5  4  5  4  6  6  7  7
6P2D        : 0  0  1  1  3  2  3  2  5  4  5  4  6  6  7  7
5P3D        : 1  0  1  0  3  2  3  2  5  4  5  4  6  6  7  7


Multiple Instance:
iss# show provider-bridge pcp encoding switch default

Pcp Encoding Table
------------------------------------
Switch - default

Port Gi0/1
-----------
DropEligible: 0 0DE 1 1DE 2 2DE 3 3DE 4 4DE 5 5DE 6 6DE 7 7DE
Priority    :
-----------------------------------------------------------------
8POD        : 0  0  1  1  2  2  3  3  4  4  5  5  6  6  7  7
7P1D        : 0  0  1  1  2  2  3  3  5  4  5  4  6  6  7  7
6P2D        : 0  0  1  1  3  2  3  2  5  4  5  4  6  6  7  7
5P3D        : 1  0  1  0  3  2  3  2  5  4  5  4  6  6  7  7
```

```
Port Gi0/2
-----------
DropEligible: 0 0DE 1 1DE 2 2DE 3 3DE 4 4DE 5 5DE 6 6DE 7 7DE
Priority    :
------------------------------------------------------------------
8POD        : 0  0  1  1  2  2  3  3  4  4  5  5  6  6  7  7
7P1D        : 0  0  1  1  2  2  3  3  5  4  5  4  6  6  7  7
6P2D        : 0  0  1  1  3  2  3  2  5  4  5  4  6  6  7  7
5P3D        : 1  0  1  0  3  2  3  2  5  4  5  4  6  6  7  7
```

Related Commands

- **`pcp-encoding`** - Configures the encoding table

28.126 show [provider-bridge] pcp decoding

This command displays PCP decoding table for all ports and also for specific ports.

show [provider-bridge] pcp decoding [{port <interface-type> <interface-num> | switch <context_name>}]

Syntax Description	**interface-type**	-	Interface Type
	interface-num	-	Interface ID
	switch	-	Context/Switch Name. This parameter is specific to Multiple Instance.
Mode	Privileged EXEC Mode		
Package	Metro		

Example

```
Single Instance:
iss# show provider-bridge pcp decoding port fast 0/1

Port Gi0/1
-----------
PCP    : 0    1    2    3    4    5    6    7
-------------------------------------------
8POD   : 0    1    2    3    4    5    6    7
7P1D   : 0    1    2    3    4DE  4    6    7
6P2D   : 0    1    2DE  2    4DE  4    6    7
5P3D   : 0DE  0    2DE  2    4DE  4    6    7

Multiple Instance:
iss# show provider-bridge pcp decoding switch default

Pcp Decoding Table
------------------------------------
Switch - default


Port Gi0/1
-----------
PCP   :  0    1    2    3    4    5    6    7
-------------------------------------------
8POD   : 0    1    2    3    4    5    6    7
7P1D   : 0    1    2    3    4DE  4    6    7
6P2D   : 0    1    2DE  2    4DE  4    6    7
5P3D   : 0DE  0    2DE  2    4DE  4    6    7
```

```
Port Gi0/2
-----------
PCP  :  0    1    2    3    4    5    6    7
-----------------------------------------------
8POD  : 0    1    2    3    4    5    6    7
7P1D  : 0    1    2    3    4DE  4    6    7
6P2D  : 0    1    2DE  2    4DE  4    6    7
5P3D  : 0DE  0    2DE  2    4DE  4    6    7
```

Related Commands

- **`show provider-bridge pep configuration`** – Displays the provider edge port configuration

28.127 show provider-bridge priority regen

This command displays priority regeneration table for all ports and also for a specific port.

show provider-bridge priority regen [port <interface-type> <interface-num>][switch <context_name>]

Syntax Description

interface-type	-	Interface Type
interface-num	-	Interface ID
switch	-	Context/Switch Name. This parameter is specific to Multiple Instance.

Mode Privileged EXEC Mode

Package Metro

Example

```
Single Instance:
iss# show provider-bridge priority regen


Service Priority Regeneration table
-----------------------------------
 Port : Gi0/1          Service VLAN-ID : 2
 Receive Priority      Regenerated Priority
-----------------      --------------------
    0                        0
    1                        1
    2                        2
    3                        3
    4                        4
    5                        5
    6                        6
    7                        7

Multiple Instance:
iss# show provider-bridge priority regen switch default

Service Priority Regeneration table
-----------------------------------
Switch - default

 Port : Gi0/1          Service VLAN-ID : 1
 Receive Priority      Regenerated Priority
-----------------      --------------------
   0                         0
   1                         1
```

2	2
3	3
4	4
5	5
6	6
7	7

Related Commands

- **`service-vlan recv-priority`** - Configures the regenerated priority for the received service priority for internal CNP

28.128 show dot1q-tunnel

This command displays the entries in the dot1q-tunnel table.

show dot1q-tunnel [{interface <ifXtype> <ifnum> | switch <context_name>}]

Syntax Description

interface	-	Interface Type and Interface Number/Id
switch	-	Context/Switch Name. This parameter is specific to Multiple Instance.

Mode Privileged EXEC Mode

Package Metro

Example

```
Single Instance:
iss# show dot1q-tunnel

Interface
 ---------
  Gi0/1
Multiple Instance:

iss# show dot1q-tunnel switch cust6

Switch - cust6

 Interface
 ---------
  Gi0/31
```

☞ If executed without the optional parameters, this command displays the information of all the available dot1q tunnel ports.

Related Command **switchport mode dot1q-tunnel** - Enables dot1q-tunneling on the specified interface

28.129 show l2protocol-tunnel

This command displays the entries in VLAN tunnel protocol table containing the number of ingress or egress STP BPDUs tunneled.

show l2protocol-tunnel [{ interface <ifXtype> <ifnum> | summary [switch <context_name>]}]

Syntax Description

interface	-	Interface Type and Interface Number/Id
summary	-	Displays brief information about the L2 protocol-tunnels
switch	-	Context/Switch Name. This parameter is specific to Multiple Instance.

Mode Privileged EXEC Mode

Package Metro

Example

```
Single Instance:
iss# show l2protocol-tunnel

COS for Encapsulated Packet : 5
 Port  Protocol  Encapsulation Counter  Decapsulation Counter
 ----  --------  ----------------------  ----------------------
 Gi0/1     stp          0                    2

iss# show l2protocol-tunnel summary

COS for Encapsulated Packet : 5
 Port  Protocol  Status
 ----  --------  ------
 Gi0/1   stp       up

iss# show l2protocol-tunnel interface gigabitethernet 0/1

COS for Encapsulated Packet : 5
 Port  Protocol  Encapsulation Counter  Decapsulation Counter
 ----  --------  ----------------------  ----------------------
 Gi0/1     stp          0                    58

Multiple Instance:
iss# show l2protocol-tunnel summary switch cust6
Switch - cust6

COS for Encapsulated Packet : 7

 Port  Protocol  Status
 ----  --------  ------
 Gi0/31   stp       up
```

☞ If executed without the optional parameters, this command displays the STP tunnel information of all the available interfaces.

Related Commands

- **`l2protocol-tunnel cos`** - Configures the priority for the tunneled STP BPDUs
- **`clear l2protocol-tunnel counters`** - Clears the L2 protocol tunnel counters

28.130 show l2protocol-discard statistics

This command displays the discard statistics for the L2 protocols.

show l2protocol-discard statistics [{interface <ifXtype> <ifnum> |[switch <context_name>]}]

Syntax Description	**interface**	-	Interface Type and Interface Number/Id
	switch	-	Context/Switch Name. This parameter is specific to Multiple Instance.
Mode	Privileged EXEC Mode		
Package	Metro		

Example

```
Single Instance:
iss# show l2protocol-discard statistics

Port Gi0/3
Protocol    Discard-Counter:Rx   Discard-Counter:Tx

Multiple Instance:
iss# show l2protocol-discard statistics
Switch-Cust1
Port Gi0/3
Protocol    Discard-Counter:Rx   Discard-Counter:Tx
```

☞ If executed without the optional parameters, this command displays the discard statistics of all the available interfaces.

Related Commands

- **l2protocol-discard** - Sets the option to discard L2 protocols received on this port

28.131 private-vlan

This command configures the private vlan type for the vlan to provide layer 2 isolation between the ports within the same broadcast domain. The no form of the command removes the pvlan type for the vlan.

```
private-vlan { primary | isolated | community }
```

```
no private-vlan
```

Syntax Description	**primary**	-	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
	isolated	-	An isolated VLAN 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.
	community	-	A community VLAN 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.
Mode	Config-VLAN Mode		
Package	Work group, Enterprise and Metro		
Example	`iss(config-vlan)# private-vlan primary`		
Related Commands	**show vlan private-vlan** - Displays the private-VLAN information for the switch		

28.132 private-vlan association

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. The no form of the command removes the secondary vlan from the primary vlan association.

```
private-vlan association [{add|remove}] <secondary_Vlan_list>

no private-vlan association
```

Syntax Description	**add**	-	Adds the given list of vlans to the existing secondary vlan list
	remove	-	removes the given list of vlans from the existing secondary vlan list
	<secondary_Vlan_list>	-	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.

Mode Config-VLAN Mode

Package Workgroup, Enterprise and Metro

Example

```
iss(config-vlan)# private-vlan association add 303,1000
```

☞ This command executes only when primary and secondary vlan are created

Related Commands

- **private-vlan –** Configures the private vlan type for the vlan to provide layer 2 isolation between the ports
- **show vlan private-vlan –** Displays the private-VLAN information for the switch

28.133 switchport private-vlan host-association

This command configures the association between the primary and secondary vlan id to host port. The no form of the command deletes the primary and secondary vlan id association from host.

switchport private-vlan host-association <primary-vlanId(1-4094)> <secondary-vlanId(1-4094)>

no switchport private-vlan host-association

Syntax Description	**<primary-vlanId(1-4094)>**	-	This is 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
	<secondary-vlanId(1-4094)>	-	This is a unique value that represents the specific secondary to which the switch port has to be associated. This value ranges between 1 and 4094.
Mode	Interface configuration mode		
Package	WorkGroup, Enterprise and Metro		
Example	`iss(config-if)# switchport private-vlan host-asssociation 35 55`		
☞	This command executes only when primary and secondary vlan are created and configured		
Related Commands	• **private-vlan** – Configures the private vlan type for the vlan to provide layer 2 isolation between the ports • **show vlan private-vlan** – Displays the private-VLAN information for the switch		

28.134 switchport private-vlan mapping

This command maps the Private VLAN promiscuous port to the primary VLAN and to the selected secondary VLANs. The no form of the command unmaps the primary and secondary vlan association for this promiscuous port.

switchport private-vlan mapping <primary_vlan_id(1-4094)> [{add | remove}] [<secondary_vlan_list>]

no switchport private-vlan mapping

Syntax Description	**<primary_vlan_id(1-4094)>**	-	This is 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
	add	-	Maps the list of secondary vlan id to this primary vlan Id and switch port
	remove	-	Unmaps the given list of primary vlan Id from the existing secondary vlan list
	<secondary_vlan_list>	-	List of secondary vlan id to which the promiscuous port is associated in the Private VLAN domain
Mode	Interface configuration mode		
Package	Workgroup, Enterprise and Metro		
Example	`iss(config-if)# switchport port mapping 34 add 35,36`		
☞	This command executes only when primary and secondary vlan are created.		
Related Commands	**private-vlan –** Configures the private vlan type for the vlan to provide layer 2 isolation between the ports		
	show vlan private-vlan – Displays the private-VLAN information for the switch		

28.135 show vlan private-vlan

This command displays the private-VLAN information for the switch

show vlan private-vlan [pvlan-type] [switch <context_name>]

Syntax Description	**pvlan-type**	-	Specifies the Possible vlan type which are primary, isolated and community
	<[switch <context_name>]>		Displays private vlan 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

Package Workgourp, Enter prise and package

Example

```
iss# show vlan private-vlan

VlanId   Type     Primary VlanId  Ports
-------  ------   ---------------- --------
20       isolated  30          Gi0/21, Gi0/22
                                 Gi0/23, Gi0/24
30       primary   -             Gi0/21, Gi0/22
                                 Gi0/23, Gi0/24
```

Related Commands

private-vlan – Configures the private vlan type for the vlan to provide layer 2 isolation between the ports

private-vlan association – Configures the private vlan type for the vlan to provide layer 2 isolation between the ports

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

Chapter 29

ECFM

The Connectivity Fault Management provides the capabilities useful for detecting, verifying and isolating connectivity failures in Virtual Bridged Local Area Networks. These capabilities are used in network operated by multiple independent organizations, each with restricted access to each other's equipment.

In general, the Network Administrator is informed about the failure in the connection based on the Continuity Check Messages reception or by the User It initiates the Loop Back or Link Trace, to quickly determine and isolate the fault condition.

Aricent ECFM supports the following list of commands to configure ECFM on a bridge:

- ethernet cfm domain level
- service
- ethernet cfm mep level
- ethernet cfm mip level vlan
- set mip-creation-criteria
- set sender-id-permission
- ethernet cfm mip dynamic evaluation
- ethernet cfm start
- ethernet cfm enable
- ethernet cfm cc
- ethernet cfm cc enable level
- ethernet cfm associate vlan-id primary-vlan-id
- ethernet cfm llc-encap

- set ethernet-cfm oui
- mep crosscheck mpid vlan
- ethernet cfm traceroute cache
- ethernet cfm traceroute cache hold-time
- ethernet cfm traceroute cache size
- ethernet cfm mip ccm-database
- ethernet cfm mip ccm-database hold-time
- ethernet cfm mip ccm-database size
- ethernet cfm loopback cache
- ethernet cfm default-domain vlan
- ethernet cfm default-domain service-instance
- ethernet cfm default-domain global
- ethernet cfm mep crosscheck
- ethernet cfm mep crosscheck start-delay
- snmp-server enable traps ethernet cfm
- mep archive-hold-time
- client-layer-level
- ping ethernet mpid
- ethernet cfm throughput type
- traceroute ethernet mpid
- show ethernet cfm domain
- show ethernet cfm service
- show ethernet cfm maintenance-point local
- show ethernet cfm maintenance-points remote detail
- show ethernet cfm maintenance-points remote
- show ethernet cfm maintenance-points remote crosscheck
- show ethernet cfm traceroute-cache
- show ethernet cfm mip-ccm-database
- show ethernet cfm errors
- show ethernet cfm statistics
- show port ethernet cfm
- show ethernet cfm global information
- show ethernet cfm default-domain
- show ethernet cfm configuration-errors
- clear ethernet cfm errors

- clear ethernet cfm maintenance-points remote
- clear ethernet cfm traceroute-cache
- clear ethernet cfm mip-ccm-database
- debug ethernet-cfm
- ethernet cfm y1731 enable
- ethernet cfm frame delay buffer size
- ethernet cfm frame loss buffer size
- ethernet cfm test
- ethernet cfm frameloss
- ethernet cfm frame delay
- ethernet cfm loopback cache – size/hold-time
- ethernet cfm error-log
- ethernet cfm mep-capability
- ethernet cfm vlan-param
- ethernet cfm service-instance-param
- set frame delay threshold
- set params
- set rdi
- set ais
- set ccm-mac
- set client-layer-mac
- set frame loss threshold
- set out-of-service
- set drop-eligibility
- set vlan-priority
- set service-instance-priority
- set one-dm-transaction-interval
- show ethernet cfm loopback cache
- show ethernet cfm maintenance-points local detail
- show ethernet cfm frame delay buffer
- show ethernet cfm error-log
- show ethernet cfm frame loss buffer
- clear ethernet cfm statistics
- clear ethernet cfm frame delay buffer
- clear ethernet cfm loopback cache

- clear ethernet cfm error-log
- clear ethernet cfm frame loss buffer
- ethernet cfm offload
- set ethernet cfm offload

29.1 ethernet cfm domain level

This command defines a CFM (Connectivity Fault Management) MD (Maintenance Domain) at a particular maintenance level and places the router in Ethernet CFM configuration mode, where parameters specific to the MD are set. The no form of the command deletes a CFM MD.

ethernet cfm domain [format {dns-like-name | mac-addr | char-string}] name <domain-name> level <level-id(0-7)>

no ethernet cfm domain name <domain-name> level <level-id(0-7)>

Syntax Description

dns-like-name	Domain name like string. Globally unique text string derived from a DNS name.
mac-addr	MAC address plus 2-octet (unsigned) integer.
char-string	RFC2579 Display string. The character codes 0-31 (decimal) are not used.
domain-name	Identifies the domain. Character string has a maximum limit of 20 characters.
level-id	Level at which the maintenance domain is defined. This integer value ranges between zero and seven.

Mode Global Configuration Mode

Package Metro

Example

```
iss(config)# ethernet cfm domain name TestDomain1 level 7
iss(config-ether-cfm)#
```

☞ The following restrictions apply, when the **ethernet cfm domain level** command is executed:

- Maintenance Domain name must be unique throughout the system.
- All the associated Maintenance Associations with this domain must be removed, prior to the removal of the Maintenance Domain.

Related Command **show ethernet cfm domain –** Displays information about the Maintenance Domains configured on the device.

29.2 service

This command configures the service (Maintenance Association) at the specified service-instance or VLAN and the no form of the command deletes the service (Maintenance Association) within a Maintenance Domain.

```
service [format {primary-vid | char-string | unsigned-int16 | rfc2865-vpn-id}]
[name <service_name>] [icc <icc_code> umc <umc_code>] [vlan <vlan-id(1-4094)>
|service-instance <service-instance(256-16777214)>] [mip-creation-criteria
{none | default | explicit | defer}] [sender-id-permission {none | chassis |
manage | chassis-mgt-address | defer}]
```

```
no service name <service_name>
```

Syntax Description

primary-vid	-	Primary VLAN ID.
char-string	-	RFC2579 DisplayString, except that the character codes 0-31 (decimal) are not used.
unsigned-int16	-	2-octet integer/big endian.
rfc2865-vpn-id	-	RFC 2865 VPN ID.
service_name	-	Identifies the association. Maximum limit of the Character string is up to 20 characters.
icc	-	ITU-Carrier Code
umc	-	Unique Maintenance Entity Group Identifier Code
vlan	-	Primary VLAN ID with which the Maintenance Association must be associated. Range of the Integer value is from 1 to 4094.
service instance	-	Indicates a service-instance for the configuration. This value ranges between 256 and 16777214
mip-creation-Criteria	-	Value indicating, whether the management entity is able to create MHF for this Maintenance Association. The following values are allowed: 1. none 2. default 3. explicit 4. defer

sender-id-permission	-	Value to control the Sender ID TLV, to be transmitted in CFM PDUs by MHFs associated with this Maintenance Association. The following values are allowed: 1. none 2. chassis 3. manage 4. chassis-mgt-address 5. defer

Mode ECFM Configuration Mode

Package METRO

Example

```
iss(config-ether-cfm)# service CustAsso1 vlan 101
```

☞

The following restrictions apply, when the **service vlan** command is executed:

- Maintenance Association Name must be unique within a Maintenance Domain.
- More than one VLAN can be associated with the Maintenance Association through the command **ethernet cfm associate vlan-id primary-vlan-id.**
- Primary VLAN ID associated with a Maintenance association is not assigned to any other Maintenance Association at the same level.
- The same Maintenance Association Name can be used, if the Maintenance Association exists in different domain.
- All the MEPs related to the Maintenance Association must be removed, before removing that Maintenance Association.

- **mip-creation-criteria** keyword is used to set the parameter required for MIP (MHFs) creation associated with Maintenance Association.
- **sender-id-permission** keyword is used to set the parameter required to control the sender ID TLV to be transmitted in CFM PDUs by MHFs (MIP) associated with this Maintenance Association.
- User can configure ICC and UMC only when Y.1731 is enabled.

Related Command

- **show ethernet cfm service** - Displays the information about the Maintenance Associations configured on the device.
- **ethernet cfm associate vlan-id primary-vlan-id** - Associates a VLAN ID or a list of VLAN IDs to a Primary VLAN.

29.3 ethernet cfm mep level

This command configures the MEP (Maintenance End Point) for an service-instance . Sets an interface as a domain boundary (edge), defines it as a MEP (Maintenance End Point), sets direction for the MEP and sets the operational status of the MEP. The no form of the command removes the MEP configuration from the interface.

An **active** keyword is provided to enable or disable the MEP, if it is already configured. By default, MEP is disabled.

For Vlan unaware MEP, Vlan is not to be specified.

ethernet cfm mep { domain <domain-name> | level <0-7>} [inward] mpid <id (1-8191)> [{service <service-name> | vlan <vlan-id (1-4094)> | service-instance <integer (256-16777214)>}][active]

no ethernet cfm mep { domain <domain-name> | level <level-id(0-7)>} [inward] mpid <id (1-8191)> [{service <service-name> | vlan <vlan-id (1-4094)> | service-instance <service-instance (256-16777214)>}] [active]

Syntax Description

domain	-	Identifies the Maintenance Domain. The maximum length of the domain-name is 20.
level	-	Maintenance Domain level for the MEP. This integer value ranges between zero and seven.
inward	-	Specifies the direction. By default, **outward** is created, that is, **down MEP**.
mpid	-	MEP identifier. This integer value ranges between 1 and 8191.
service	-	Indicates the service name. The maximum length of the service-name is 20.
vlan		VLAN ID. This value ranges between 1 and 4094.
service-instance	-	Service instance identifier for which the MEP is defined. This is required only for the ISID aware MEP. This is applicable only for ports in PBB bridge mode. This value ranges between 256 and 16777214 (2^24-1).
active	-	Operational status of the MEP. By default, MEP will not be active.

Mode Interface Configuration Mode

Package Metro

Defaults

Direction of MEP.	-	outward
Operation status	-	disabled

Example

```
iss(config-if)# ethernet cfm mep level 5 mpid 5 vlan 101

iss(config-if)# ethernet cfm mep level 0 mpid 1 service-instance 10 active
```

- The following restrictions apply, when the **`ethernet cfm mep level mpid vlan`** command is executed:
  - On a particular interface, only one MEP can be configured at a particular level, VlanId and direction.
  - MPID has to be unique in a Maintenance Association.
- The following is the order in which the Ethernet Connectivity Fault Management elements must be configured:
  - Domain at the same level as the MEP to be configured.
  - Service within the domain (Maintenance Association).
  - If a Service (Maintenance Association) is to be associated with more than one Vlan-id, then its Primary VLAN ID must be mapped to all the associated VLAN Ids with the command **`ethernet cfm associate vlan-id primary-vlan-id`**
  - Ma Mep List with MepId of the MEP to be configured with the command **`mep crosscheck mpid <Id> [vlan < vlan-id >]`**
- For configuring MEP, Ma Mep List must necessarily be configured, otherwise this command will fail.
- For ISID, the operator should not configure the PIP as an UP MEP, as this has no significance.
- In a command, only **isid** or **vlanid** can be given. Both cannot be provided in one command.
- For ports in PBB bridge mode, this command is used to configure MEP on CNP, PIP, CBP and PNP. The list of the types of MEP possible on all these ports is given in the below mentioned table.

CHAPTER 32 ort Type	CHAPTER 33: UP MEP	CHAPTER 34: Down MEP
CNP Stagged	ISID + Port Up MEP for ISID (when PISID is configured on CNP)	S-VLAN + Port MEP for the PBN network MEP for the customer network MEP for the PBN network Link Level MEP
CNP Ctagged	ISID + Port Up MEP for ISID (when PISID is configured on CNP)	C-VLAN + Port MEP for the customer network MEP for the PBN network Link Level MEP
PIP	NA	ISID + Port ISID level to monitor the ISID path in the

		PBBN. Link level to monitor the link between the PIP and the next CBP for that ISID
CBP	BVLAN ISID + Port ISID level to monitor the ISID path in the PBBN When ECFM message received on one CBP has to be sent on another CBP for a peer to peer PBBN connection.	ISID + Port Link level to monitor the link between the CBP and the PIP attached to the CBP for that ISID
PNP	B-VLAN + Port Up MEP for VLAN	B-VLAN + Port VLAN level to monitor the B-VLAN path in the PBBN Link Level MEP

Related Commands

- **`show ethernet cfm maintenance-point local`** - Displays the maintenance points (MEPs, MIPs) configured on the device.
- **`mep crosscheck mpid vlan`** - Defines a MEP in a maintenance association's MEP List (crosscheck list) which is associated with the provided VLAN.

29.4 ethernet cfm mip level vlan

This command configures a Maintenance Intermediate Point (MIP) at the specified maintenance level and VLAN on an interface. The no form of the command removes the MIP configuration from the interface.

An “active” keyword is provided to enable or disable the MIP, if it is already configured.

ethernet cfm mip {domain <domain-name> | level <level-id (0-7)>} {service <service-name> | vlan <vlan-id (1-4094)> | service-instance <integer(256-16777214)>} [active]

no ethernet cfm mip {domain <domain-name> | level <level-id (0-7)>} {service <service-name> | vlan <vlan-id (1-4094)>| service-instance <integer(256-16777214)>} [active]

Syntax Description

domain	-	Identifies the Maintenance Domain. The maximum length of the domain-name is 20.
level	-	Specifies the maintenance level at which the MIPs are defined. This integer value ranges between zero and seven..
service	-	Indicates the service name. The maximum length of the service-name is 20.
vlan		VLAN ID. Range is from 1 to 4094.
service-instance	-	Service instance for which the MIP is being defined. This value ranges between 256 and 16777214.
active	-	Specifies the MIP’s operational status. By default, MIP will be active.

Mode Interface Configuration Mode

Package Metro

Defaults Operational status of MIP - disabled

Example `iss(config-if)# ethernet cfm mip level 5 vlan 1`

☞ The following restrictions apply, when the **`ethernet cfm mip level vlan`** command is executed:

- There must not be any MP configured at an equal or higher MD Level at the same VLAN than the MIP to be configured.
- Level with which MIP is to be created must be set corresponding to the vlan by using command **`ethernet cfm default-domain vlan`**
- If the service (Maintenance Association) associated with the specified VLAN and level is configured in the system, with atleast an up (inward) MEP then its MHF creation parameter must not be “none”. It can be modified using the command **`service vlan.`**
- If the above MA exists and its MHF criteria is “defer”, then its enclosing domain’s MHF creation parameter must be either “default or explicit”. It can be modified using the command **`set mip-creation-criteria`**.
- If service (Maintenance Association) associated with the specified VLAN and level is not configured in the system, then the default MHF creation parameter must not be “none”. It can be modified using the command **`ethernet cfm default-domain vlan`** or **`ethernet cfm default-domain global`** for any vlan.
- For PBB, this command can be used to configure a MIP for a B-VLAN on a PNP and for C-VLAN and S-VLAN on a CNP.
- For ports in PBB bridge-mode, operator should use this command only for PNP and CNP.

Related Commands

- **`ethernet cfm domain level`** - Defines the maintenance domain.
- **`service`** – Defines the maintenance association.
- **`set mip-creation-criteria`** - Sets MIP creation criteria for a particular Maintenance Domain.
- **`show ethernet cfm maintenance-point local`** - Displays the maintenance points (MEPs, MIPs) configured on a device.

29.5 set mip-creation-criteria

This command sets MIP creation criteria for a particular Maintenance Domain. MIP creation criteria is applicable only if Maintenance Domain's underlying Maintenance Association 's MIP creation criteria is "defer".

```
set mip-creation-criteria {none | default | explicit}
```

Syntax Description

mip-creation-criteria	- Value is used to create MHF associated with MA in this Maintenance Domain, if and only if MA's mip creation criteria is "defer" . The following values are allowed: 1. none 2. default 3. explicit

Mode ECFM Configuration Mode

Package Metro

Example

```
iss(config-ether-cfm)# set mip-creation-criteria explicit
```

29.6 set sender-id-permission

This command sets Sender ID permission for a particular Maintenance Domain. Sender ID permission criteria is applicable only if Maintenance Domain's underlying Maintenance Association's SenderID permission is "defer".

```
set sender-id-permission {none | chassis | manage | chassis- mgt-address}
```

Syntax Description

sender-id-permission	Value is used to control the Sender ID TLV, to be transmitted in CFM PDUs by MHFs associated with MAs in this Maintenance Domain, if and only if MA's sender-id-permission is "defer". The following values are allowed: 1. none 2. chassis 3. manage 4. chassis-mgt-address

Mode ECFM Configuration Mode

Package Metro

Example

```
iss(config-ether-cfm)# set sender-id-permission chassis
```

29.7 ethernet cfm mip dynamic evaluation

This command enables a dynamic evaluation and creation of Maintenance Intermediate Point (MIP) on a device. The no form of the command disables a dynamic evaluation of MIP.

ethernet cfm mip dynamic evaluation

no ethernet cfm mip dynamic evaluation

Mode Global Configuration Mode

Package Metro

Defaults Disable

Example

```
iss(config)# ethernet cfm mip dynamic evaluation
```

29.8 ethernet cfm start

This command starts an Ethernet connectivity fault Management (CFM), processing globally on the switch. The no form of the command shutdown an Ethernet CFM processing on the switch

ethernet cfm start

no ethernet cfm start

Mode Global Configuration Mode

Package Metro

Defaults Start

Example
```
iss(config)# ethernet cfm start
```

29.9 ethernet cfm enable

This command enables a Connectivity Fault Management (CFM) processing globally on a device or on an interface. The no form of the command disables the CFM processing globally on a device or on an interface.

ethernet cfm enable

no ethernet cfm enable

Mode Global Configuration Mode or Interface Configuration Mode

Package Metro

Defaults Disable

Example

```
iss(config)# ethernet cfm enable

iss(config-if)# ethernet cfm enable
```

Related Commands **ethernet cfm y1731 enable** – Enables Y.1731 processing globally on a device.

29.10 ethernet cfm cc

This command sets the parameters (that is, Interval and Role) for CCMs (Continuity Check Messages). The level and vlan identifies the service (Maintenance Association) to which the configuration applies. The no form of the command sets the CCM interval and role parameter to the default value (that is, 60000 milliseconds and Fault-Management respectively) for the MA at the specified level and vlan.

For VLAN unaware services (Maintenance Association), vlan is not to be specified.

```
ethernet cfm cc {domain <domain-name> | level <a,b,c-d>} [service <service-
name> | vlan{<vlan-id <1-4094)> | vlan-list} | service-instance <integer(256-
16777214)>] [interval {three-hundred-hertz | ten-ms | hundred-ms | one-sec |
ten-sec | one-min | ten-min}] [role {fault-management | performance-monitoring
| protection-switching}]
```

```
no ethernet cfm cc {domain <domain-name> | level <a,b,c-d)>} [{service
<service-name> | vlan <a,b,c-d)> | service-instance <integer(256-16777214)>}]
([interval] [role])
```

Syntax Description

domain	-	Identifies the Maintenance Domain. The maximum length of the domain-name is 20.
level	-	Indicates the maintenance level for the configuration. This integer value ranges between zero and seven.
service	-	Indicates the service name. The maximum length of the service-name is 20.
vlan-id	-	Indicates a VLAN for configuration. The value ranges from 1 to 4094.
vlan-list		Indicates a list of VLANs.
service-instance	-	Indicates a service-instance for the configuration. This value ranges between 256 and 16777214.
interval	-	The time between CCM transmissions. Options are: • three-hundred-hertz – one-third of millisecond • ten-ms – 10 milliseconds • hundred-ms – 100 milliseconds • one-sec – one second • ten-sec – 10 seconds • one-min – one minute • ten-min – 10 minutes

	role	-	ETH-CC role to be performed. Options are: • fault-management – ETH-CC is used for Fault Management. • performance-monitoring – ETH-CC is used for Performance Monitoring. • protection-switching – ETH-CC is used for Protection Switching.

Mode Switch Configuration Mode

Defaults

interval	-	one-min
role	-	fault-management

Package Metro

Example

```
iss(config-switch)# ethernet cfm cc enable level 6 vlan 5
```

☞

- This command is used to set the parameters for CC transmission for a Maintenance Association, that is, for a particular level and for a particular VLAN.
- This command is used to set the same parameters for different level and VLANs as it supports the level list and VLAN list.

Related Commands **`ethernet cfm cc enable level`** - Enables the CC transmission on the bridge.

29.11 ethernet cfm cc enable level

This command enables the transmission of Continuity Check Messages (CCMs). The level and vlan identifies the Maintenance End Points (MEPs) to which the configuration applies. The no form of the command disables the transmission of CCMs.

For the transmission of CCMs by the Vlan unaware MEPs, vlan is not to be specified.

```
ethernet cfm cc enable {domain <domain-name> | level <a,b,c-d>} [service
<service-name> | vlan <a,b,c-d> | service-instance <integer(256- 16777214)>]
```

```
no ethernet cfm cc enable {domain <domain-name> | level <a,b,c-d>} [service
<service-name> | vlan <a,b,c-d> | service-instance <integer(256-16777214)>]
```

Syntax Description

domain	-	Identifies the Maintenance Domain. The maximum length of the domain-name is 20.
level	-	Identities maintenance level. This integer value ranges between zero and seven.
service	-	Indicates the service name. The maximum length of the service-name is 20.
vlan	-	Specifies the VLAN for which the MEPs need to transmit the CC messages. Range of the integer value is from 1 to 4094.
service-instance		Indicates a service-instance for the configuration. This value ranges between 256 and 16777214.

Mode Switch Configuration Mode

Defaults Disable

Package Metro

Example

```
iss(config-switch)# ethernet cfm cc enable level 6 vlan 5
```

☞

- If the parameters for the CC transmission are not configured, that is, if the **ethernet cfm cc level {level-id | levellist} [vlan {vlan-id | vlanlist}]** command is not executed, then the default CCM Interval (1000ms) will be used.
- This command is also executed for the Level list and the VLAN list.

Related Commands **ethernet cfm cc** - Sets the CC transmission configuration parameter (CCM Interval).

29.12 ethernet cfm associate vlan-id primary-vlan-id

This command associates a VLAN ID or a list of VLAN IDs to a Primary VLAN. The no form of the command deletes the mapping of a VLAN ID or a list of VLAN IDs with a Primary VLAN.

```
ethernet cfm associate vlan-id <a.b,c-d>  primary-vlan-id <vlan-id(1-4094)>
no ethernet cfm associate vlan-id <a,b,c-d> primary-vlan-id <vlan-id(1-4094)>
```

Syntax Description

Vlan-id	Identifies the VLAN to which the Primary VLAN ID must be associated. Range of the integer value is from 1 to 4094.
Primary-vlan-id	Identifies the Primary VLAN ID. The range of the integer value is from 1 to 4094.

Mode Global Configuration Mode

Package Metro

Example

```
iss(config)# ethernet cfm associate vlan-id 1,2,3 primary-vlan-id 7
```

☞

The following restriction apply, when the **ethernet cfm associate vlan-id primary-vlan-id** command is executed:

- VLAN ID and Primary VLAN ID cannot be the same.
- One VLAN cannot be associated with more than one Primary VLAN.

29.13 ethernet cfm llc-encap

This command enables or disables the LLC (Logical Link Control) header addition in the transmitted CFM PDU.

ethernet cfm llc-encap {enable | disable}

Mode Interface Configuration Mode

Package Metro

Defaults Disable

Example
```
iss(config-if)# ethernet cfm llc-encap enable
```

29.14 set ethernet-cfm oui

This command configures the Organization Unique Identifier (OUI). The no form of the command resets the OUI to its default value.

set ethernet-cfm oui <aa:aa:aa>

no ethernet-cfm oui

Mode Global Configuration Mode

Package Metro

Defaults Default value corresponds to the first three bytes of the System MAC Address

Example
```
iss(config)# set ethernet-cfm oui 02:03:04
```

29.15 mep crosscheck mpid vlan

This command statically defines an MEP (Maintenance End Point) in a Crosscheck List (MA-MEP List) within a Maintenance Association. The no form of the command deletes statically defined MEP from the Crosscheck List.

Vlan/Service-Instance unaware MEP can be statically defined by not providing vlan/service-Instance.

```
mep crosscheck mpid <id(1-8191)> [{service <service-name> | vlan <integar(1-4094) | service-instance <integer(256-16777214)>}]
```

```
no mep crosscheck mpid <id(1-8191)> [{service <service-name> | vlan <integer(1-4094)> | service-instance <integer(256-16777214)>]
```

Syntax Description

mpid	-	Identifies MEP. The mep-id value ranges from 1 to 8191.
service	-	Indicates the service name. The maximum length of the service-name is 20.
vlan	-	Identifies the Primary VLAN ID of service (Maintenance Association) with which remote MEP must be associated. The value ranges from 1 to 4094.
service-instance	-	Identifies a service-instance in a Provider backbone bridge mode. This value ranges between 256 and 16777214.

Mode ECFM Configuration Mode

Package Metro

Example

```
iss(config-ether-cfm)# mep crosscheck mpid 20 vlan 5

iss(config-ether-cfm)# iss(config-ether-cfm)# mep crosscheck mpid 20 service-instance 250
```

☞

The following restrictions apply, when the **mep crosscheck mpid vlan** command is executed:

- MEP Identifier must be unique within the service (Maintenance Association).

29.16 ethernet cfm traceroute cache

This command enables caching of Ethernet Connectivity Fault Management (CFM) data learned through traceroute (Linktrace Replies) messages. The no form of the command disables caching.

ethernet cfm traceroute cache

no ethernet cfm traceroute cache

Mode Global Configuration Mode

Package Metro

Defaults Disable

Example
```
iss(config)# ethernet cfm traceroute cache
```

Related Commands

- **ethernet cfm traceroute cache hold-time** - Sets a maximum time, that the Ethernet CFM traceroute cache entries will be retained.
- **ethernet cfm traceroute cache size** - Sets a maximum number for the entries in an Ethernet CFM traceroute cache table.

29.17 ethernet cfm traceroute cache hold-time

This command sets the linktrace replies (LTR Table) to maximum age. The no form of command sets the linktrace replies maximum age to default value

ethernet cfm traceroute cache hold-time <minutes (1-65535)>

no ethernet cfm traceroute cache hold-time

Syntax Description

minutes	. Specifies the number of minutes that cache entries will be retained. Range of the integer values is from 1 to 65535.

Mode Global Configuration Mode

Package Metro

Defaults 100 minutes

Example

```
iss(config)# ethernet cfm traceroute cache hold-time 150
```

☞

The following restrictions apply, when the **ethernet cfm traceroute cache hold-time** command is executed:

- Traceroute caching must be enabled.

Related Commands **ethernet cfm traceroute cache** - Enables traceroute caching.

29.18 ethernet cfm traceroute cache size

This command sets the maximum size for the Ethernet Connectivity Fault Management (CFM) traceroute cache Table. The no form of the command resets the size to the default value.

ethernet cfm traceroute cache size <entries(1-4095)>

no ethernet cfm traceroute cache size

Syntax Description

entries	-	Number of entries in the Traceroute cache Table, expressed as an integer in the range of 1 to 4095.

Mode Global Configuration Mode

Package Metro

Defaults 100 entries

Example

```
iss(config)# ethernet cfm traceroute cache size 200
```

The following restrictions apply, when the **ethernet cfm traceroute cache size** command is executed:

- Traceroute caching must be enabled.
- Traceroute cache must be empty before execution of this command. It can be emptied by the command **clear ethernet cfm traceroute-cache.**

Related Commands

- **ethernet cfm traceroute cache** - Enables traceroute caching.
- **clear ethernet cfm traceroute-cache** – Clears traceroute cache.

29.19 ethernet cfm mip ccm-database

This command enables caching of Ethernet Connectivity Fault Management (CFM) data learned through the Continuity Check Messages (CCM). The no form of the command disables caching.

ethernet cfm mip ccm-database

no ethernet cfm mip ccm-database

Mode Global Configuration Mode

Package Metro

Defaults Disable

Example
```
iss(config)# ethernet cfm mip ccm-database
```

Related Commands

- **ethernet cfm mip ccm-database hold-time -** Sets a maximum time that the Ethernet CFM MIP CCM Database entries will be retained.
- **ethernet cfm mip ccm-database size -** Sets a maximum number for the entries in an Ethernet CFM MIP CCM Database.

29.20 ethernet cfm mip ccm-database hold-time

This command sets the Ethernet Connectivity Fault Management(CFM) MIPCCM database entry maximum age. The no form of the command sets the database entry maximum age to default value..

ethernet cfm mip ccm-database hold-time <hours (24-48)>

no ethernet cfm mip ccm-database hold-time

Syntax Description

hours	-	Specifies the number of hours that the database entries will be retained. The integer value ranges from 24 to 48.

Mode Global Configuration Mode

Package Metro

Defaults 24 hours

Example

```
iss(config)# ethernet cfm mip ccm-database hold-time 30
```

☞ The following restrictions apply, when the **ethernet cfm mip ccm-database hold-time** command is executed:

- MIP CCM database caching must be enabled.

Related Commands **ethernet cfm mip ccm-database -** Enables caching in MIP CCM database

29.21 ethernet cfm mip ccm-database size

This command sets the maximum size for the Ethernet Connectivity Fault Management (CFM) MIP CCM Database. The no form of the command resets the size to the default value.

ethernet cfm mip ccm-database size <entries (1000-10000)>

no ethernet cfm mip ccm-database size

Syntax Description

entries	-	Number of entries in the MIP CCM database, expressed as an integer in the range of 1000 to 10000.

Mode Global Configuration Mode

Package Metro

Defaults Size is 1000 entries

Example

```
iss(config)# ethernet cfm mip ccm-database size 1500
```

☞

The following restrictions apply, when the **ethernet cfm mip ccm-database size** command is executed:

- MIP CCM database caching must be enabled.
- MipCcmDatabase must be empty before execution of this command. It can be emptied by the command **clear ethernet cfm mip-ccm-database.**

Related Commands

- **ethernet cfm mip ccm-database** - Enables caching in MIP CCM database.
- **clear ethernet cfm mip-ccm-database -** Removes the contents of the MIP CCM Database.

29.22 ethernet cfm loopback cache

This command enables loopback cache. The no form of the command disables loopback caching.

ethernet cfm loopback cache

no ethernet cfm loopback cache

Mode Global Configuration Mode

Package Metro

Defaults Enabled

Example
```
iss(config)# ethernet cfm loopback cache
```

Related Commands

- **show ethernet cfm loopback cache** - Displays the loopback replies received from remote MEPs (Maintenance End Points).
- **ethernet cfm loopback cache – size/hold-time** - Sets maximum value for size and/or hold-time of the loopback cache.
- **clear ethernet cfm loopback cache** - Clears the contents of the Loopback Reply Cache.

29.23 ethernet cfm default-domain vlan

This command sets the parameters of default Maintenance Domain (MD) level , to control MHF creation at the VLAN Ids which are not attached to any Service (Maintenance Association) and SenderID TLV transmission by these created MHFs

ethernet cfm default-domain vlan <vlan-id (1-4094)> ([level (0-7)] [mip-creation-criteria {none | explicit | defer | default}] [sender-id-permission {none | chassis | manage | chassis-mgt-address | defer}])

Syntax Description

vlan	· Identifies the VLAN. Range of the integer value is from 1 to 4094.
level	· Identifies a maintenance level. Range of the integer value is from 0 to 7.
mip-creation-criteria	· Identifies the value indicating, if MIP can be created. The following are the possible values: 1. none 2. explicit 3. defer 4. default.
sender-Id-permission	· Identifies the value indicating, if anything is to be included in the sender ID TLV transmitted by the MIP created by the Default Maintenance domain. The following are the possible values: 1. none 2. chassis 3. manage 4. chassis-mgt-address 5. defer

Mode Global Configuration Mode

Package Metro

Example

```
iss(config)# ethernet cfm default-domain vlan 2 level 1 mip-creation-criteria explicit sender-id-permission chassis
```

Related Commands **ethernet cfm default-domain vlan** - Sets the parameters required for MIP (MHFs) creation at any VLAN and the Sender-ID TLV transmission by those MHFs created by the Default Maintenance Domain.

29.24 ethernet cfm default-domain service-instance

This command sets the parameters of default Maintenance Domain (MD) Level, to control MHF creation at the ISIDs which are not attached to any Service (Maintenance Association) and SenderID TLV transmission by those MHFs.

ethernet cfm default-domain service-instance <integer(256-16777214)> ([level (0-7)] [mip-creation-criteria {none | explicit | defer | default}][sender-id-permission {none |chassis | manage | chassis-mgt-address | defer }])

Syntax Description

service-instance	- Identifies the ISID. Range of the integer value is from 256 to 16777214.
level	- Identifies a maintenance level. Range of the integer value is from 0 to 7.
mip-creation-criteria	- Identifies the value indicating, if MIP can be created. The following are the possible values: 1. none 2. default 3. explicit 4. defer
sender-Id-permission	- Identifies the value indicating, if anything is to be included in the sender ID TLV transmitted by the MIP created by the Default Maintenance domain. The following are the possible values: 1. none 2. chassis 3. manage 4. chassis-mgt-address 5. defer

Mode Global Configuration Mode

Package METRO

Example

```
iss(config)# ethernet cfm default-domain vlan 2 level 1 mip-creation-criteria explicit sender-id-permission chassis
```

Related Commands **ethernet cfm default-domain vlan** - Sets the parameters required for MIP (MHFs) creation at any ISID and the Sender-ID TLV transmission by those MHFs created by the Default Maintenance Domain.

29.25 ethernet cfm default-domain global

This command sets the global Default Maintenance Domain (MD) parameters to control MIP creation and SenderID TLV transmission by MHFs..

ethernet cfm default-domain global ([level <0-7>] [mip-creation-criteria {none | explicit | default}][sender-id-permission {none | chassis | manage | chassis-mgt-address}])

Syntax Description

level-id	Identifies a maintenance level. Range of the integer value is from 0 to 7.
mip-creation-criteria	Identifies the value indicating, if MIP can be created. The following are the possible values: 1. none 2. explicit 3. default
sender-id-permission	Identifies the value indicating, if anything is to be included in the sender ID TLV transmitted by the MIPs created by the Default Maintenance domain. The following are the possible values: 1. none 2. chassis 3. manage 4. chassis-mgt-address

Mode Global Configuration Mode

Package Metro

Example

```
iss(config)# ethernet cfm default-domain global level 1
criteria explicit id-permission chassis
```

29.26 ethernet cfm mep crosscheck

This command enables cross checking between the list of configured Maintenance End Points (MEPs) of a Service (Maintenance Association) . Cross checking is disabled using the command with the disable keyword.

Enabling/Disabling applies to vlan unaware services (MA) only if vlan is not specified. Level range is from 0 to 7 and Vlan range is from 1 to 4094

ethernet cfm mep crosscheck {enable | disable} {domain <domain-name> | level <a,b,c-d>} [{service <service-name> | vlan <a,b,c-d | service-instance <service-instance (256-16777214)>}> [switch <context_name>]

Syntax Description

enable	-	Indicates that the cross-checking occurs.
disable	-	Indicates that the cross-checking does not occur.
domain	-	Identifies the Maintenance Domain. The maximum length of the domain-name is 20.
level	-	Identifies a maintenance level. Range of the integer value is from 0 to 7.
service	-	Indicates the service name. The maximum length of the service-name is 20.
vlan	-	Identifies the VLAN. Range of the integer value is from 1 to 4094.
service-instance	-	Identifies the service instance for the configuration. This value ranges between 256 and 16777214.
switch	-	Context/Switch Name

Mode Global Configuration Mode

Package Metro

Defaults Enabled

Example

```
iss(config)# ethernet cfm mep crosscheck enable level 1 vlan 2
```

Related Commands

- **show ethernet cfm errors** - Displays CFM continuity check error conditions logged on a device since it was last was last cleared.
- **show ethernet cfm maintenance-points remote crosscheck** - Displays the information about the remote MEPs in the cross-check list that are configured statically.

29.27 ethernet cfm mep crosscheck start-delay

This command configures the maximum amount of time (number of CCMs) that a device waits for the remote Maintenance End Points (MEPs) to come up before the cross-check operation is started. The no form of the command resets the time to the default value.

ethernet cfm mep crosscheck start-delay <delay (3-100) >

no ethernet cfm mep crosscheck start-delay

Syntax Description

delay	- Specifies the time (number of CCMs) for which a device waits for the remote Maintenance End Points (MEPs) to come up. The integer value ranges from 3 to 100.

Mode Global Configuration Mode

Package Metro

Defaults 3

Example

```
iss(config)# ethernet cfm mep crosscheck start-delay 10
```

Related Commands **ethernet cfm mep crosscheck** - Enables or Disables cross checking between the list of configured Maintenance End Points (MEPs) of a Service (Maintenance Association).

29.28 snmp-server enable traps ethernet cfm

This command enables snmp traps for CC (continuity check) events. The no form of the command disables snmp traps for CC events.

```
snmp-server enable traps ethernet cfm {[all] | {[rdi-ccm][mac-status][mep-missing][errored-ccm][cross-connect][loss-of-continuity][unexpected-period][unexpected-mep][mis-merge][unexpected-level][local-link-failure][hardware-failure][software-failure][frame-loss][frame-delay][bit-error][ais-condition][lck-condition]}}
```

```
no snmp-server enable traps ethernet cfm {[all] | {[rdi-ccm][mac-status][mep-missing][errored-ccm][cross-connect][loss-of-continuity][unexpected-period][unexpected-mep][mis-merge][unexpected-level][local-link-failure][hardware-failure][software-failure][frame-loss][frame-delay][bit-error][ais-condition][lck-condition]}}
```

Syntax Description

`all`	-	Enables traps for all defect conditions.
`rdi-ccm`	-	Enables traps for remote MEP defect condition.
`mac-status`	-	Enables traps when some remote MEP reports that its Interface Status TLV is not **isUp** or all remote MEPs reports that a Port Status TLV contains value other than **psUp**.
`mep-missing`	-	Enables traps for MEP missing defect condition.
`errored-ccm`	-	Enables traps when MEP receives atleast one invalid CCM whose CCM interval is not timed out.
`cross-connect`	-	Enables traps when MEP receives atleast one CCM from another MAID or a lower MD level whose CCM interval is not timed out.
`loss-of-continuity`	-	Enables traps for loss of continuity defect condition.
`unexpected-period`	-	Enables traps for unexpected period defect condition.
`unexpected-mep`	-	Enables traps for unexpected MEP defect condition.
`mis-merge`	-	Enables traps for mismerge defect condition.
`unexpected-level`	-	Enables traps for MEG level defect condition.
`local-link-failure`	-	Enables traps for local link failure defect condition.
`hardware-failure`	-	Enables traps for internal hardware failure defect condition.
`software-failure`	-	Enables traps for internal software failure defect condition.

frame-loss	-	Enables traps when calculated frame loss value is greater than the configured frame loss threshold value.
frame-delay	-	Enables traps for when calculated frame delay value is greater than the configured frame delay threshold value.
bit-error	-	Enables traps for bit-error defect condition.
ais-condition	-	Enables traps for alarm indication defect condition.
lck-condition	-	Enables traps for locked defect condition.

Mode Switch Configuration Mode

Package Metro

Example

```
iss(config-switch)# snmp-server enable traps ethernet cfm loss-
of-continuity frame-delay
```

29.29 mep archive-hold-time

This command sets the amount of time that the data from a missing Maintenance End Point (MEP) is kept in the continuity check database before they are purged. The no form of command sets the configured archive hold time to default value.

mep archive-hold-time <minutes (100-65535)>

no mep archive-hold-time

Syntax Description

minutes	. Specifies the number of minutes that data from a missing MEP is kept before it is purged. The integer value ranges from 100 to 65535.

Mode ECFM Configuration Mode

Package Metro

Defaults 100 minutes

Example

```
iss(config-ether-cfm)# mep archive-hold-time 1000
```

29.30 client-layer-level

This command configures the client layer MEPs MD level required for multicast AIS and LCK messages. The no form of the command resets the configured client layer MEPs MD level required for multicast AIS and LCK messages.

```
client-layer-level <level-id(0-7)>
```

```
no client-layer-level
```

Syntax Description

level-id	. Identifies the client layer MEPs MD level. This integer value ranges between zero and seven.

Mode ECFM Configuration Mode

Package Metro

Defaults -1

Example

```
iss(config-ether-cfm)# client-layer-level 5
```

Related Commands **set client-layer-mac** - Sets the client layer MAC address for the AIS and/or LCK messages.

29.31 ping ethernet mpid

This command sends the unicast or multicast loopback messages.

```
ping ethernet [mpid <peer-mepid(1-8191)> | mac<peer-mac(aa:aa:aa:aa:aa:aa)>]
{domain <domain-name> | level <level-id(0-7)>} [{service <service-name> | vlan
<vlan-id(1-4094)>  |  service-instance  <service-instance(256-16777214)>}]
[interface  <interface-type>  <interface-number>]  [direction  {inward  |
outward}][lbm-mode {req-resp | burst}][data-pattern <string> | test-pattern
null-signal-without-crc | null-signal-with-crc | prbs-without-crc | prbs-with-
crc] [size <pdu-size(64-9000)> | variable-bytes] [interval <milliseconds(1-
600000)>][count <num_of_msgs(1-8192)>] [deadline <seconds(1-172800)>] [stop]
[switch<context_name>]
```

Syntax Description

mpid	-	Identifies the destination MEP. The integer value ranges from 1 to 8191.
mac	-	Specifies the MAC address.
domain	-	The specified Maintenance Domain, where the destination MEP resides.
level	-	The specified Maintenance Domain Level. The value ranges between zero and seven.
service	-	Indicates the service name. The maximum length of the service-name is 20.
vlan	-	Identifies the VLAN. The value ranges form 1 to 4094.
service-instance	-	Indicates a service-instance for the configuration. This value ranges between 256 and 16777214.
interface-type	-	Type of interface.
interface-number	-	Interface identifier.
direction	-	Specifies the direction of the MEP. inward – MEP faces in up direction on the bridge port outward – MEP faces in down direction on the bridge port
data-pattern	-	Arbitrary amount of data to be included in the data TLV.
test-patern null-signal-without-crc	-	Pattern contains null signal without any CRC.
null-signal-with-crc	-	Pattern contains null signal with CRC.
prbs-without-crc	-	Pattern contains pseudo random bit sequence without any CRC.
prbs-with-crc	-	Pattern contains pseudo random bit sequence with CRC.

size	-	Size of the pattern to be included in the TLV.
variable-bytes	-	Indicates that a varying number of data bytes is to be sent in the message.
interval	-	Interval between two successive loopback transmissions to be used by the MEP. The value ranges from 1 to 600000 milliseconds.
count	-	Number of message to be send.
deadline	-	Deadline timeout(in seconds), before loopback ping exits, if configured number of messages are sent before timeout.
stop	-	Stops the ongoing LBM transaction. This is valid only when Y.1731 is enabled.
switch	-	Context/Switch Name

Mode

User Exec Mode / Privileged EXEC Mode

Package

Metro

Defaults

Data TLV is not to be included

Example

```
iss# ping ethernet mac 00:01:02:03:04:06 level 6 vlan 5
count 2 switch 1
PING 00:01:02:03:04:06 from 00:01:02:03:04:03 with 34(64)
bytes of data.
64 bytes from 00:01:02:03:04:06: seq_no=0 time=100 ms
64 bytes from 00:01:02:03:04:06: seq_no=1 time=100 ms
--- 00:01:02:03:04:06 ping statistics ---
packets sent = 2, packets received = 2, packets lost  = 0
(0.000% loss),
unexpected received = 0, duplicates received = 0,
bad received = 0, checksum errors = 0,
rtt min/avg/max = 100/100/100 ms
```

☞ The following restrictions apply, when the **ping ethernet mpid vlan** command is executed:

- Local MEP within a specified Maintenance Domain and with the same VLAN must be configured prior to the execution of this command.
- Mac Address of Target MPID must be learned from Continuity Check Messages prior to the execution of this command.

Related Commands

clear ethernet cfm loopback cache - Clears the contents of the Loopback Reply Cache.

29.32 ethernet cfm throughput type

This command performs throughput measurement

```
ethernet cfm throughput type {one-way | two-way } {mpid <peer-mepid(1-8191)> |
mac <peer-mac(aa:aa:aa:aa:aa:aa)>}{domain <domain-name> | level <level-id(0-
7)>} [{service <service-name> | vlan <vlan-id(1-4094)> | service-instance
<service-instance (256-16777214)>}][interface <interface-type> <interface-
number>] [direction {inward |outward}][test-pattern {null-signal-without-crc |
null-signal-with-crc | prbs-without-crc | prbs-with-crc}][init-size <pdu-
size(64-9000)>][rate <pps(1-100000)>][count <num_of_msgs(1-8192)>] [deadline
<seconds(1-172800)>][{burst-count<integer(1-8192)> | burst-deadline <milli-
seconds(1-172800)>}][stop][switch<string(32)>]
```

Syntax Description

type	-	Throughput can be calculated through one-way or two way.
mpid	-	Identifies the destination MEP. The integer value ranges from 1 to 8191.
mac	-	Specifies the MAC address
domain	-	The specified Maintenance Domain, where the destination MEP resides.
level	-	The specified Maintenance Domain Level. The value ranges from 0 to 7
service	-	Indicates the service name. The maximum length of the service-name is 20.
vlan	-	Identifies the VLAN. The range of the integer value is from 1 to 4094.
service-instance	-	Service instance for which throughput value is being calculated. This value ranges between 256 and 16777214.
interface	-	Specifies the interface type and interface number
direction	-	Specfiies the direction of the MEP. inward – MEP faces in up direction on the bridge port outward – MEP faces in down direction on the bridge port
test-patern null-signal-without-crc	-	Pattern contains null signal without any CRC.
null-signal-with-crc	-	Pattern contains null signal with CRC.
prbs-without-crc	-	Pattern contains pseudo random bit sequence without any CRC.
prbs-with-crc	-	Pattern contains pseudo random bit sequence with CRC.

	init-size	-	Size of the packet to be transmitted.
	rate		Packet per sec value to transmitted.
	count	-	Number of message to be send.
	deadline	-	Time in seconds for which Throughput transaction continues.
	burst-count	-	Number of messages to be transmitted in a burst
	burst-deadline	-	Time in milliseconds for which a single burst continues.
	stop	-	Used to stop the ongoing throughput transaction
	switch	-	Context/Switch Name

Mode

User Exec Mode / Privileged EXEC Mode

Package

Metro

Defaults

Data TLV is not to be included.

Burst Count – 10

Burst Deadline - 10 msec

Example

```
iss# ethernet cfm throughput type two-way mac
00:01:02:03:04:09 level 6 vlan 5 rate 100 count 50 burst-
count 10 switch cust1 1211000/1.000000, packet size 1513
bytes 00:01:02:03:04:09 two-way throughput statistics final
throughput 1208800 / 1.000000, packet size 1511 bytes
transmission rate = 100 pps
```

The following restrictions apply, when the **ethernet cfm throughput type two-way mpid <> vlan** command is executed:

- Local MEP within a specified Maintenance Domain and with the same VLAN must be configured prior to the execution of this command.
- Mac Address of Target MPID must be learned from Continuity Check Messages prior to the execution of this command.
- Test Capability should be enabled at the other end

Related Commands

- **ping ethernet mpid -** Sends the Ethernet Connectivity Fault Management (CFM) loopback messages to a MAC address (Maintenance End Point (MEP) or Maintenance Intermediate Point (MIP)) destination.
- **clear ethernet cfm loopback cache** - Clears the contents of the Loopback Reply Cache.
- **ethernet cfm loopback cache** - Enables loopback cache.

29.33 traceroute ethernet mpid

This command initiates Linktrace message by providing MEP identifier of the destination MEP (Maintenance End Point) or the MAC Address of the MEP or MIP.

```
traceroute ethernet {mpid <mep-id> | mac <aa:aa:aa:aa:aa:aa>} {domain <domain-name> | level <level-id(0-7)>} [service <service-name> | vlan <vlan-id(1-4094)>] | service-instance <service-instance(256-16777214)>] [interface <interface-type> <interface-number>] [direction {inward | outward}] [time-to-live <ttl-value(1-255)>][timeout <milliseconds(10-10000)>] [use-mip-ccm-db] [switch <context_name>]
```

Syntax Description

mpid	-	Identifies the destination MEP. The integer value ranges from 1 to 8191.
mac	-	Specifies the MAC address.
domain	-	The domain where the destination MEP resides. The maximum value of the character string is 20 characters.
level	-	The specified Maintenance Level. The value ranges from 0 to 7.
service	-	Indicates the service name. The maximum length of the service-name is 20.
vlan	-	Identifies the VLAN. The range of the integer value is from 1 to 4094.
service-instance	-	Indicates a service-instance for the configuration. The value ranges from 256 to 16777214.
interface-type	-	Type of the interface.
interface-number	-	Interface identifier.
direction	-	Specfiies the direction of the MEP. inward – MEP faces in up direction on the bridge port outward – MEP faces in down direction on the bridge port
time-to-live	-	The specified time to live value The value ranges from 1 to 255.
timeout	-	Deadline timeout(in milliseconds),before which the trace route reply must come. The value ranges from 10 to 10000 milliseconds.

use-mip-ccm-db	-	Indicates MIP CCM Database to be used for forwarding the LTM
switch	-	Context/Switch Name

Mode User Exec Mode / Privileged EXEC Mode

Package Metro

Defaults time-to-live – 64

Example

```
 iss# traceroute ethernet mac  00:01:02:03:04:06  level 6
vlan 5 time-to-live 10 timeout 1000 switch 1

Traceroute to Macaddress 00:01:02:03:04:06    in domain
meg1 at level 6 with vlanId 5
-------------------------------------------------------------
Hops      Host                 Ingress MAC       Ingress
Action   Relay Action
          Next Host            Egress MAC        Egress
Action    Fwd Status
-------------------------------------------------------------
--------------------
1   00:00:00:00:00:00:00:00        -               -
RlyHit
    00:00:00:00:00:00:00:00  00:01:02:03:04:06   EgrOK
Terminal MEP
```

☞ The following restrictions apply, when the **traceroute ethernet mpid vlan** command is executed:

- Local MEP within a specified Maintenance Domain and with the same VLAN must be configured.
- Mac Address of Target MPID must be learned from Continuity Check Messages prior to the execution of this command.

29.34 show ethernet cfm domain

This command displays the information about all the CFM Maintenance Domains configured on a device.

show ethernet cfm domain [brief] [switch <context_name>]

Syntax Description

switch	-	Context/Switch Name

Mode User Exec Mode / Privileged Exec Mode

Package Metro

Example

```
iss# show ethernet cfm domain brief

    Domain Name          Index     Level     Services  Archive
(min)
    oper1                1         4         1         100
    oper2                2         3         1         100
    oper3                3         5         0         100
```

Related Commands **ethernet cfm domain level** - Configures the Maintenance Domain on the bridge at the specified level.

29.35 show ethernet cfm service

This command displays the information about all the CFM Maintenance Associations configured on a device.

show ethernet cfm service [brief] [switch <context_name>]

Syntax Description

switch	-	Context/Switch Name

Mode User Exec Mode / Privileged Exec Mode

Package Metro

Example

```
iss# show ethernet cfm service brief

ServiceName     Index   Primary-Vlan Level MEPs CCM Interval
me1             1       5            6     2    1 second

iss# show ethernet cfm service

Service Name : me1
Domain Name  : meg1
Index        : 1
Primary Vid  : 5
Level        : 6

MHF Creation Criteria : defer
Sender Id Permission  : defer
CC Role     : fault management
ICC Code    : me1
UMC Code    : meg1
Total MEPs : 2
Primary Vlan Associations :
None
Crosscheck status : Enabled
Crosscheck:
MPID Vlan Type           Mep-Up Mac Address
1    5    Local          Yes    00:01:02:03:04:03
2    5    Remote         No     Not learned
```

Related Commands **service** - Configures the Maintenance Association within a domain.

29.36 show ethernet cfm maintenance-point local

This command displays the details of all the maintenance points (Maintenance End Point (MEP) or Maintenance Intermediate Point (MIP)) configured on a device.

show ethernet cfm maintenance-point local [mep | mip] [interface [<interface-type> <interface-number>] | [domain <domain-name>] | [level <level-id (0-7)>] [switch <context_name>]

Syntax Description

mep | mip	-	Maintenance Association End-points or Maintenance Intermediate points.
interface	-	The specified interface is, for which MP information is required.
domain	-	Identifies the Maintenance Domain. Maximum length of the domain-name is 20, for which the MP information is required.
level	-	The specified Maintenance Level ranging from zero to seven, for which the MP information is required.
switch	-	Context/Switch Name

Mode User Exec Mode / Privileged Exec Mode"

Package Metro

Example

```
iss# show ethernet cfm maintenance-point local mep
------------------------------------------------------------------------
MPID Domain name  Level VLAN ISID Type Port  MAC          CC-Status
     Service name                  Dir                    MP-Status
------------------------------------------------------------------------
1    Oper1        0     0    NA   MEP  3  00:01:02:03:04:05 Disabled
     maOper1                        Up                       Active
2    Oper2        1     NA   10   MEP  3  00:01:02:03:04:05 Disabled
     maOper2                        Up                       Active
```

Related Commands

- **ethernet cfm mep level** - Configure the MEP at a specific level in a specific VLAN.
- **ethernet cfm mip level vlan** - Configure the MIP at a specific level in a specific VLAN.
- **show ethernet cfm maintenance-points local detail** - Displays the detailed information about the maintenance end points (MEP) locally configured on the device.

29.37 show ethernet cfm maintenance-points remote detail

This command displays the information about the remote maintenance points in continuity check database.

```
show ethernet cfm maintenance-points remote detail {mpid <mep-id(1-8191)> |
mac <aa:aa:aa:aa:aa:aa> }[domain <domain-name> | level <level-id(0-7)>
[{service <service-name> | unaware | vlan <vlan-id(1-4094)> | service-instance
<service-instance (256-16777214)>}]][switch <context_name>]
```

Syntax Description

mpid	-	Indicates a maintenance point. Range of the integer value is from 1 to 8191.
mac	-	Indicates the MAC Address. MAC address of the remote maintenance point is in the format: xx:xx:xx:xx:xx.
domain	-	The specified Maintenance Domain. Domain–name - 20 (string length) character name, that identifies the Maintenance Domain.
level	-	The specified Level of Maintenance Domain. Range of the integer value is from 0 to 7.
service	-	Indicates the service name. The maximum length of the service-name is 20.
vlan	-	The specified VLAN of the remote MEP. Range of the integer value is from 1 to 4094.
unaware	-	Indicates for VLAN-unaware remote MEP
service-instance	-	Service instance of remote MEP. This value ranges between 256 and 16777214.
switch	-	Context/Switch Name

Mode User Exec Mode / Privileged Exec Mode”

Package Metro

Example

```
iss# show ethernet cfm maintenance-points remote detail
mpid 61 level 5

MAC Address: 00:01:02:03:04:05
Domain/Level: DOMAIN_OPERATOR_L5_1/5
VLAN: 6
MPID: 2
RMPID: 61
Remote MEP State: Default
Remote MEP Rdi: True
CC Packet Statistics: 0 (Error)
```

Related Commands

- **show ethernet cfm maintenance-point local –** Displays information about the maintenance points (MEPs and MIPs) configured on a device.
- **show ethernet cfm maintenance-points remote crosscheck –** Displays information about the maintenance points configured in the Maintenance Association's MEP List (cross-check list).
- **show ethernet cfm maintenance-points remote** - Displays information about remote maintenance points in the continuity check database.

29.38 show ethernet cfm maintenance-points remote

This command displays the information about the remote maintenance points in continuity check database.

show ethernet cfm maintenance-points remote [domain <string(20)> | level <level-id (0-7)>] [switch <context_name>]

Syntax Description

domain	The specified Maintenance Domain. Domain–name - 20 (string length) character name, that identifies the Maintenance Domain.
level	The specified Level of Maintenance Domain. Range of the integer value is from 0 to 7.
switch	Context/Switch Name

Mode User Exec Mode / Privileged Exec Mode

Package Metro

Example

```
iss# show ethernet cfm maintenance-points remote

RMPID MPID Vlan Domain                Level Mep-Up
2     1    1    Oper1                 2     Yes
3     1    1    Oper1                 2     No
4     2    2    Oper2                 1     No
```

Related Commands

- **show ethernet cfm maintenance-point local** – Displays information about the maintenance points (MEPs and MIPs) configured on a device.
- **show ethernet cfm maintenance-points remote crosscheck** – Displays information about the maintenance points configured in the Maintenance Association's MEP List (cross-check list).
- **show ethernet cfm maintenance-points remote detail** – Displays detailed information about remote maintenance points in the continuity check database.

29.39 show ethernet cfm maintenance-points remote crosscheck

This command displays information about the remote maintenance points configured statically in service's Crosscheck-List (MA's -Meplist).

```
show ethernet cfm maintenance-points remote crosscheck [mpid <mepid(1-8191)>]
[domain <domain-name> | level <level-id(0-7)>] [{service <service-name> |
unaware | vlan <vlan-id(1-4094)> | service-instance <integer(256-16777214)>}]
[switch <context_name>]
```

Syntax Description

mpid	-	The specified maintenance point. The range of the integer value is from 1 to 8191.
domain	-	The specified Maintenance Domain. Domain name -1-20 string length character name that identifies the Maintenance Domain.
level	-	The specified Level of Maintenance Domain. Range of the integer value is from zero to seven.
service	-	Indicates the service name. The maximum length of the service-name is 20.
Vlan	-	Indicates VLAN ID of the remote MEP. Range of the integer value is from 1 to 4094.
unaware		Indicates for VLAN-unaware remote MEP.
service-instance	-	Service instance of remote MEP. This value ranges between 256 and 16777214.
switch	-	Context/Switch Name

Mode User Exec Mode / Privileged Exec Mode"

Package Metro

Example

```
iss# show ethernet cfm maintenance-point remote
crosscheck mpid 60 level 5

MPID RMPID Level VLAN Mep-Up Remote Mac
2     61   5        2 No     No entry in CCM DB
4     60   5        2 No     00:01:02:03:04:05
```

Related Commands

- **`show ethernet cfm maintenance-point local`** - Displays information about the maintenance points configured on a device.
- **`show ethernet cfm maintenance-points remote detail`** - Displays detailed information about the remote maintenance points in continuity check database.
- **`show ethernet cfm maintenance-points remote`** - Displays information about remote maintenance points in the continuity check database.

29.40 show ethernet cfm traceroute-cache

This command displays the contents of the traceroute cache.

show ethernet cfm traceroute-cache [switch <context_name>]

Syntax Description

switch	-	Context/Switch Name

Mode User Exec Mode / Privileged Exec Mode"

Package Metro

Example

```
iss# show ethernet cfm traceroute-cache

 LTR cache configured maximum size : 100 entries

Traceroute to Macaddress 00:01:02:03:04:05:06  in domain  oper1 at level 2 with vlanId
2


-------------------------------------------------------
     Host     MAC     Ingress  IngressAction Relay Action
Hops NextHost Forwarded Egress EgressAction
-------------------------------------------------------
1    xx   00:02:03:04:05:06       ActionOk   RlyHit
     zz   Not Forwarded  00:01:02 ActionOk
```

Related Commands **ethernet cfm traceroute cache –** Enable caching of Ethernet Connectivity Fault Management (CFM) data learned through the traceroute messages.

29.41 show ethernet cfm mip-ccm-database

This command displays the contents of the MIP CCM Ethernet Connectivity Fault Management (CFM) data learned through the Continuity Check Messages (CCM).

show ethernet cfm mip-ccm-database [service <service-name> | vlan <vlan-id (1-4094)>] [address <aa:aa:aa:aa:aa:aa>] [interface <interface-type> <interface-id>] [switch <context_name>]

Syntax Description

service	-	Indicates the service name. The maximum length of the service-name is 20.
vlan	-	Indicates the VLAN Identifier. The range of the identifier is from 1 to 4094.
address	-	Specifies the MAC address.
interface	-	Indicates the interface type and interface identifier.
switch	-	Context/Switch Name

Mode User Exec Mode / Privileged Exec Mode"

Package Metro

Example

```
iss# show ethernet cfm mip-ccm-database interface
gigabitethernet 0/4


---------------------------------
Vlan     Mac Address        Port
---------------------------------
2      00:01:02:03:04:05:06    4
3      00:01:02:03:04:05:06    4
```

Related Commands **ethernet cfm mip ccm-database –** This command enables caching of Ethernet Connectivity Fault Management (CFM) data learned through the Continuity Check Messages (CCM)

29.42 show ethernet cfm errors

This command displays the Connectivity Fault Management (CFM) continuity check error conditions logged on a device, since it was last cleared.

show ethernet cfm errors [domain <domain-name> | level <level-id (0-7)>] [switch <context_name>]

Syntax Description

domain - The specified Maintenance Domain.
Domain–name – 20 (string length) character name, that identifies the Maintenance Domain.

level - Integer in the range of 0 to 7 that identifies the Maintenance Domain's Level.

switch - Context/Switch Name

Mode User Exec Mode / Privileged Exec Mode"

Package Metro

Example

```
iss# show ethernet cfm errors

Switch default

Switch 1

MEP-ID :  1
Level VLAN RMEP-ID   Current defect type
----- ---- -------   -------------------
6     5    4         remote defect indication
6     5    2         loss of continuity
6     5    3         loss of continuity

Switch 2

MEP-ID :  4
Level VLAN RMEP-ID   Current defect type
----- ---- -------   -------------------
6     5    1         remote defect indication
6     5    2         loss of continuity
6     5    3         loss of continuity
6     5    5         loss of continuity
```

Related Commands **clear ethernet cfm errors –** Clears the continuity check conditions logged on a device.

29.43 show ethernet cfm statistics

This command displays the Ethernet CFM statistics such as number of CCM PDUs transmitted and received on an interface, number of times RDI defect occurred etc.

```
show ethernet cfm statistics [interface {<interface-type> <interface-number>}
[domain <domain-name> | level <level-id (0-7)>] [{service <service-name> |
<vlan-id (1-4094)> | service-instance <service-instance (256-16777214)>}]]
[switch <context_name>]
```

Syntax Description

interface	-	Displays the statistics, such as, number of CCM transmitted, number of CFM PDUs transmitted for an interface.
domain	-	Identifies the Maintenance Domain. The maximum length of the domain-name is 20.
level	-	Identifies the Maintenance Domain's Level. The range of the identifier is from zero to seven.
service		Indicates the service name. The maximum length of the service-name is 20.
vlan-id	-	Indicates the VLAN Identifier. The range of the identifier is from 1 to 4094.
service-instance	-	Indicates the service instance ID. This value ranges between 256 and 16777214.
switch	-	Context/Switch Name

Mode User Exec Mode / Privileged Exec Mode"

Package Metro

Example

```
iss# show ethernet cfm statistics

Number of times Memory Allocation fails  :         0
Number of times Buffer Allocation fails  :         0
Number of times module was enabled       :         1
Number of times module was disabled      :         2
Number of times no defect occured in any MEP    :  0
Number of times RDI defect occured in any MEP   :  1
Number of times MACStatus defect occured in any MEP : 0
Number of times Remote CCM defect occured in any MEP: 0
Number of times Error CCM defect occured in any MEP : 2
Number of times Xconn defect occured in any MEP : 0

iss# show ethernet cfm statistics interface gigabitethernet 0/1

CFM PDU transmitted              :      3371
CCM PDU transmitted              :      3368
LBM PDU transmitted              :         3
```

```
LBR PDU transmitted                :          0
LTM PDU transmitted                :          0
LTR PDU transmitted                :          0

CFM PDU received                   :          4
CCM PDU received                   :          2
LBM PDU received                   :          0
LBR PDU received                   :          0
LTM PDU received                   :          0
LTR PDU received                   :          0
Bad CFM PDU received               :          0
CFM PDU forwarded                  :          2
CFM PDU discarded                  :          0
```

Related Commands **`clear ethernet cfm statistics`** - Clears the statistic counters of ECFM.

29.44 show port ethernet cfm

This command displays the Ethernet CFM port specific parameters.

show port ethernet cfm [interface{<interface-type><interface-number>}][switch <context_name>]

Syntax Description

interface	-	Specifies the interface type and interface number.
switch	-	Context/Switch Name

Mode User Exec Mode / Privileged Exec Mode

Package Metro

Example

```
iss# show port ethernet cfm

interface gigabitethernet 0/1
------------------------------
ECFM Status       : Enabled
LLC Encapsulation : Disabled
MEPs Configured   : 0
MIPs Configured   : 0


interface gigabitethernet 0/2
------------------------------
ECFM Status       : Enabled
LLC Encapsulation : Disabled
MEPs Configured   : 0
MIPs Configured   : 0


interface gigabitethernet 0/3
------------------------------
ECFM Status       : Enabled
LLC Encapsulation : Disabled
MEPs Configured   : 1
MIPs Configured   : 0


interface gigabitethernet 0/4
------------------------------
ECFM Status       : Enabled
LLC Encapsulation : Disabled
MEPs Configured   : 0
MIPs Configured   : 0
```

```
interface gigabitethernet 0/5
------------------------------
ECFM Status       : Enabled
LLC Encapsulation : Disabled
MEPs Configured   : 0
MIPs Configured   : 0
```

29.45 show ethernet cfm global information

This command displays the Ethernet CFM global information.

show ethernet cfm global information [switch <context_name>]

Syntax Description

switch	-	Context/Switch Name

Mode User Exec Mode / Privileged Exec Mode

Package Metro

Example

```
iss# show ethernet cfm global information

Configured OUI : 00:00:00

ECFM Status    : Started, Enabled

MIP CCM Database
----------------
Status    : Enabled
Size      : 1000 entries
Hold-time : 24 minutes

Traceroute Cache
----------------
Status    : Enabled
Size      : 100 entries
Hold-time : 100 minutes

MIP Creation Dynamic Evaluation : Disabled
Cross-Check Delay               : 3

Enabled Traps
-------------
Cross-connect
Mep-missing
```

29.46 show ethernet cfm default-domain

This command displays the global Default-domain parameters and the modified parameters corresponding to a VLAN.

show ethernet cfm default-domain [switch <context_name>]

Syntax Description **switch** - Context/Switch Name

Mode User Exec Mode / Privileged Exec Mode

Package Metro

Example

```
iss# show ethernet cfm default-domain

Default-domain parameters
-------------------------

Level                 : 0
MIP Creation Criteria : none
SenderId Permission   : none

iss# show ethernet cfm default-domain

Default-domain parameters
-------------------------

Level                 : 0
MIP Creation Criteria : none
SenderId Permission   : none

------------------------------------------------------------------------------
Vlan Level Status                  MIP-Creation criteria SenderId Permission
------------------------------------------------------------------------------
6    -1    No MA with Up-MEP exists   defer               manage
8     5    No MA with Up-MEP exists   default             defer
```

29.47 show ethernet cfm configuration-errors

This command displays the Ethernet CFM configuration related errors such as CFM leak, Conflicting VLAN IDs, Excessive Levels and so on.

show ethernet cfm configuration-errors [service <service-name> | vlan <vlan-id(1-4094)> | service-instance <integer(256-16777214)>] [interface <interface-type> <interface-id>] [switch <context_name>]

Syntax Description

service	-	Indicates the service name. The maximum length of the service-name is 20.
vlan-id	-	Indicates the VLAN Identifier. The range of the identifier is from 1 to 4094.
service-instance	-	Indicates a service-instance for the configuration. This value ranges between 256 and 16777214
interface	-	Specifies the interface type and interface identifier.
switch	-	Context/Switch Name

Mode User Exec Mode / Privileged Exec Mode

Package Metro

Example

```
iss# show ethernet cfm configuration-errors

Configuration Errors
--------------------------------------------
interface gigabitethernet: 0/3    VLAN : 2
Cfm Leak
Conflicting Vids
--------------------------------------------
interface gigabitethernet: 0/2    VLAN : 3
Cfm Leak
--------------------------------------------
```

29.48 clear ethernet cfm errors

This command clears the ECFM continuity check error conditions logged on a device.

```
clear ethernet cfm errors [domain <domain-name> | level <level-id (0-7)>]
[switch <context_name>]
```

Syntax Description

Domain	Identifies the Maintenance Domain. Character string has a maximum limit of 20 characters.
Level	Level at which the Maintenance Domain is defined. The range of the integer value is from 0 to 7.
switch	Context/Switch Name

Mode User Exec Mode / Privileged EXEC Mode

Package Metro

Example

```
iss# clear ethernet cfm errors level 1
```

Related Commands **show ethernet cfm errors –** Displays the Continuity check error conditions logged on a device.

29.49 clear ethernet cfm maintenance-points remote

This command removes the contents of the continuity check database.

clear ethernet cfm maintenance-points remote [domain <domain-name> | level <level-id(0-7)>] [switch <context_name>]

Syntax Description

Domain	Identifies the Maintenance Domain. Character string has a maximum limit of 20 characters.
Level	Level at which the Maintenance Domain is defined. The range of the integer value is from 0 to 7.
switch	Context/Switch Name

Mode User Exec Mode / Privileged EXEC Mode

Package Metro

Example

```
iss# clear ethernet cfm maintenance-points remote level 1
```

Related Commands

- **show ethernet cfm maintenance-points remote detail** - Displays detailed information about the remote maintenance points in Continuity check database.
- **show ethernet cfm maintenance-points remote** – Displays information about remote maintenance points in the Continuity check database

29.50 clear ethernet cfm traceroute-cache

This command removes the contents of the traceroute cache.

```
clear ethernet cfm tarceroute-cache [switch <context_name>]
```

Syntax Description	**switch**	- Context/Switch Name
Mode	User Exec Mode / Privileged EXEC Mode	
Package	Metro	
Example	`iss# clear ethernet cfm traceroute-cache`	
Related Commands	• **ethernet cfm traceroute cache** - Enables traceroute caching. • **show ethernet cfm traceroute-cache** – Displays the contents of traceroute cache.	

29.51 clear ethernet cfm mip-ccm-database

This command removes the contents of the MIP CCM Database.

```
clear ethernet cfm mip-ccm-database [switch <context_name>]
```

Syntax Description	**switch**	- Context/Switch Name
Mode	User Exec Mode / Privileged EXEC Mode	
Package	Metro	
Example	`iss# clear ethernet cfm mip-ccm-database`	
Related Commands	**ethernet cfm mip ccm-database -** Enables caching in MIP CCM database.	

29.52 debug ethernet-cfm

This command sets the various trace levels available for the Ethernet CFM Module and the no form of the command resets the given Ethernet CFM trace level.

debug ethernet-cfm {global | {[all] | {[critical] [init] [resource] [failure] [pkt] [buffer] [ctrl] [func-entry] [func-exit]}} [switch <context_name>]}

no debug ethernet-cfm {global | {[all] | {[critical] [init] [resource] [failure] [pkt] [buffer] [config] [ctrl] [func-entry] [func-exit]}} [switch <context_name>]}

Syntax Description

switch	-	Context/Switch Name

Mode User Exec Mode / Privileged EXEC Mode

Package Metro

Example

```
iss# debug ethernet-cfm all

ECFM-CC   : Taking CC lock ....
ECFM-CC   : Selecting CC Context [0] ....
ECFM-CC   : ... success-select-cc-context
ECFM-CC   : ... success-take-cc-lock
ECFM-CC   : Selecting CC Context [0] ....
ECFM-CC   : ... success-select-cc-context
ECFM-CC   : Releasing CC Context ....
ECFM-CC   : ... success-release-cc-context
ECFM-CC   : Selecting CC Context [0] ....
ECFM-CC   : ... success-select-cc-context
ECFM-CC   : Releasing CC Context ....
ECFM-CC   : ... success-release-cc-context
ECFM-CC   : Selecting CC Context [0] ....
ECFM-CC   : ... success-select-cc-context
ECFM-LBLT: Taking LbLt lock ....
ECFM-LBLT: ... success-take-lblt-lock
ECFM-LBLT: Releasing LbLt lock ....
ECFM-LBLT: ... success-release-lblt-lock
```

29.53 ethernet cfm y1731 enable

This command enables Y.1731 processing globally on a device. The no form of the command disables Y.1731 processing globally on a device.

ethernet cfm y1731 enable

no ethernet cfm y1731 enable

Mode	Switch Configuration Mode / Interface Configuration Mode
Package	Metro
Defaults	By default, the Y.1731 processing is disabled globally.
Example	`iss(config-switch)# ethernet cfm y1731 enable` `iss(config-switch)# no ethernet cfm y1731 enable`
☞	For Y. 1731 to be enabled, ECFM must be enabled.
Related Commands	**ethernet cfm enable** – Enables a Connectivity Fault Management (CFM) processing globally on a device or on an interface.

29.54 ethernet cfm frame delay buffer size

This command sets the maximum size for the Frame Delay buffer. The no form of the command sets the maximum size for the Frame Delay buffer to the default value.

ethernet cfm frame delay buffer size <entries(1-4096)>

no ethernet cfm frame delay buffer size

Syntax Description	**entries**	-	Maximum ECFM frame loss buffer size maintained for performance monitoring. This value ranges between 1 and 4096.
Mode	Switch Configuration Mode		
Package	Metro		
Defaults	1024		

Example

```
iss(config-switch)# ethernet cfm frame delay buffer size 256
```

Related Commands

- **ethernet cfm frame delay** – Starts or stops the delay measurement calculations.
- **show ethernet cfm frame delay buffer** – Displays the contents of the rolling buffer maintained for Frame delay calculations measured at various time.
- **clear ethernet cfm frame delay buffer** – Clears the contents of the Frame Delay rolling buffer.

29.55 ethernet cfm frame loss buffer size

This command sets the maximum size for the frame loss buffer. The no form of the command sets maximum size for the frame loss buffer to the default value.

ethernet cfm frame loss buffer size <entries(1-4096)>

no ethernet cfm frame loss buffer size

Syntax Description	**entries**	-	Maximum size of the frame loss buffer. This integer value ranges between 1 and 4096.
Mode	Switch Configuration Mode		
Package	Metro		
Defaults	1024		
Example	`iss(config-switch)# ethernet cfm frame loss buffer size 256`		
Related Commands	• **set frame loss threshold** - Sets the threshold values for near-end and far-end frame loss. Notification is sent to management and registered external modules if the loss exceeds the configured threshold. • **show ethernet cfm frame loss buffer -** Display the contents of the rolling buffer maintained for Frame loss calculations measured at various time. • **clear ethernet cfm frame loss buffer -** Clears the contents of the frame loss rolling buffer.		

29.56 ethernet cfm test

This command sends unicast or multicast test messages.

```
ethernet cfm test [mpid <peer-mepid(1-8191)> | mac<peer-mac(aa:aa:aa:aa:aa:aa)>] {domain <domain-name> | level <level-id(0-7)>} [service <service-name> | vlan <vlan-id(1-4094)> | service-instance <service-instance (256-16777214)>] [interface <interface-type> <interface-number>] [direction {inward | outward}][pattern null-signal-without-crc | null-signal-with-crc | prbs-without-crc |prbs-with-crc] [size <pdu-size(64-9000)> | variable-bytes] [interval<milliseconds(1-600000)>] [count <num_of_msgs(1-8192)>] [deadline<seconds(1-172800)>] [stop] [switch <string(32)>]
```

Syntax Description

mpid	-	Identifies the destination MEP. The integer value ranges from 1 to 8191.
mac	-	Specifies the MAC address.
domain	-	The specified Maintenance Domain, where the destination MEP resides.
level	-	The specified Maintenance Domain Level. The value ranges from 0 to 7
service	-	Indicates the service name. The maximum length of the service-name is 20.
vlan	-	Identifies the VLAN. The range of the integer value is from 1 to 4094.
service-instance	-	Identifies the service instance. This value ranges between 256 and 16777214.
interface	-	Specifies the interface type and interface number
direction		Specfiies the direction of the MEP. inward – MEP faces in up direction on the bridge port outward – MEP faces in down direction on the bridge port
patern null-signal-without-crc	-	Pattern contains null signal without any CRC.
null-signal-with-crc	-	Pattern contains null signal with CRC.
prbs-without-crc	-	Pattern contains pseudo random bit sequence without any CRC.
prbs-with-crc	-	Pattern contains pseudo random bit sequence with CRC.

size		Size of the pattern to be included in the TLV.
variable-bytes	-	Indicates that a varying number of data bytes is to be sent in the message.
interval	-	Interval between two successive loopback transmissions to be used by the MEP. The value ranges from 1 to 600000 milliseconds.
count		Number of message to be send.
deadline	-	Deadline timeout(in seconds), before loopback ping exits, if configured number of messages are sent before timeout.
switch	-	Switch Name

Mode Switch Configuration Mode

Package Metro

Defaults Test Interval - 1sec

Pattern Type - Pattern contains pseudo random bit sequence without any CRC

Example

```
iss# ethernet cfm test mac 00:01:02:03:04:09 level 6 vlan 5 count
10 switch cust1
TST to 00:01:02:03:04:09 from 00:01:02:03:04:01 with 33(64) bytes
of data.
60 bytes to 00:01:02:03:04:09: seq_no=100
60 bytes to 00:01:02:03:04:09: seq_no=101
60 bytes to 00:01:02:03:04:09: seq_no=102
60 bytes to 00:01:02:03:04:09: seq_no=103
60 bytes to 00:01:02:03:04:09: seq_no=104
60 bytes to 00:01:02:03:04:09: seq_no=105
60 bytes to 00:01:02:03:04:09: seq_no=106
60 bytes to 00:01:02:03:04:09: seq_no=107
60 bytes to 00:01:02:03:04:09: seq_no=108
60 bytes to 00:01:02:03:04:09: seq_no=109
--- 00:01:02:03:04:09 test statistics ---
packets sent = 10  with prbs signal without crc32 pattern
```

Related Commands

- **set frame loss threshold** - Sets the threshold values for near-end and far-end frame loss. Notification is sent to management and registered external modules if the loss exceeds the configured threshold.
- **show ethernet cfm frame loss buffer -** Display the contents of the rolling buffer maintained for Frame loss calculations measured at various time.
- **clear ethernet cfm frame loss buffer -** Clears the contents of the frame loss rolling buffer.

29.57 ethernet cfm frameloss

This command starts or stops the measurement of single –ended frame loss for a point-to-point ETH connection.

```
ethernet cfm frame loss [start | stop] {domain <string(20)> | level <level-
id(0-7)>} [service <service-name> | vlan <vlan-id(0-4094)> | service-instance
<service-instance (256-16777214)>] [interface <type> <num>] [direction {inward
| outward}] {mpid <peer-mepid(1-8191)> | mac <peer-mac(aa:aa:aa:aa:aa:aa)>}
[interval <milliseconds(100-600000)>] [count <num_of_observations(1-8192)>]
[deadline <seconds(1-172800)>] [switch <context_name>]
```

Syntax Description

start	-	Starts the Frame loss transaction.
stop	-	Stops the frame loss transaction.
domain	-	Identifies the Maintenance Domain. The maximum length of the domain-name is 20.
level	-	The specified Maintenance Domain Level. The value ranges between zero and seven.
service	-	Indicates the service name. The maximum length of the service-name is 20.
vlan	-	Identifies the VLAN. The value ranges from 1 to 4094.
service-instance	-	Identifies the service instance. This value ranges between 256 and 16777214.
interface	-	Type of interface and number
direction	-	Specfiies the direction of the MEP which is initiating Loss Measurement transaction. inward – MEP faces in up direction on the bridge port outward – MEP faces in down direction on the bridge port
mpid	-	Identifies the destination MEP. The integer value ranges from 1 to 8191.
mac	-	Specifies the MAC address of the peer MEP.
interval	-	Interval between two successive loss measurement messages to be used by the MEP. The value ranges from 1 to 600000 milliseconds.
count	-	Number of message to be send.

	deadline	-	Deadline timeout (in seconds), time for which the transaction should continue.
	switch	-	Context/Switch Name

Mode User EXEC mode / Priviledged EXEC mode

Package Metro

Defaults No default values for count and deadline.

If neither 'count' nor 'deadline' is provided, then loss measurement transaction will be initiated for infinite period of time.

Example

```
iss# ethernet cfm frame loss start level 7 vlan 10 interface 0/1
direction inward mpid 2 count 20 switch cust1
```

Related Commands

- **set frame loss threshold** - Sets the threshold values for near-end and far-end frame loss. Notification is sent to management and registered external modules if the loss exceeds the configured threshold.
- **show ethernet cfm frame loss buffer -** Display the contents of the rolling buffer maintained for Frame loss calculations measured at various time.
- **clear ethernet cfm frame loss buffer -** Clears the contents of the frame loss rolling buffer.

29.58 ethernet cfm frame delay

This command starts or stops the frame delay measurement calculations for a point to point ETH connection If start or stop option is not provided then by default it is considered as start.

```
ethernet cfm frame delay [{start | stop}] type {one-way | two-way } {domain
<domain-name> | level <level-id(0-7)>} [service <service-name> | vlan <vlan-
id(1-4094)> | service-instance <service-instance (256-16777214)>] [interface
<interface-type> <interface-number>] [direction {inward | outward}]{mpid
<peer-mepid(1-8191)> | mac <peer-mac(aa:aa:aa:aa:aa:aa)>} [interval
<milliseconds(10-10000)>] [count <num_of_observations(1-8192)>] [deadline
<seconds(1-172800)>] [switch <context_name>]
```

Syntax Description

start	-	Starts the delay measurement calculations.
stop	-	Stops the delay measurement calculation.
type	-	Type of delay measurement to be initiated. one-way – Measurement is calculated at destination end. two-way – Measurement is calculated at initiation end.
domain	-	Identifies the Maintenance Domain. The maximum length of the domain-name is 20.
level	-	Level at which the maintenance domain is defined. This value ranges from 0 to 7.
service	-	Indicates the service name. The maximum length of the service-name is 20.
vlan	-	VLAN ID. This value ranges from 0 to 4094.
service-instance	-	Identifies the service instance. This value ranges between 256 and 16777214.
interface	-	Specifies the interface type and interface identifier.
direction	-	Specifies the direction of the MEP. inward – MEP faces in up direction on the bridge port outward – MEP faces in down direction on the bridge port
mpid	-	MEP Identifier. This value ranges from 1 to 8191.
mac	-	MAC address.
count	-	The number of frame delay observations to be made.
interval	-	Interval, in milliseconds, between different counts to be made. This value ranges from 10 to 10000 milliseconds.
deadline	-	Specifies a timeout, in seconds, before delay measurement operation exits. This value ranges from 1 to 172800 seconds.
switch	-	Context/Switch Name

Mode User Exec Mode / Privileged EXEC Mode

Package Metro

Defaults

start/stop	-	Start
Type	-	two-way

Example

```
iss# ethernet cfm frame delay start type two-way level 6 vlan 5
interface Gigabitethernet 0/3 mac  00:01:02:03:04:06 count 2
```

Related Commands

- **`ethernet cfm frame delay buffer size`** – Sets the maximum size for the Frame Delay buffer
- **`show ethernet cfm frame delay buffer`** – Displays the contents of the rolling buffer maintained for Frame delay calculations measured at various time.
- **`clear ethernet cfm frame delay buffer`** – Clears the contents of the Frame Delay rolling buffer.

29.59 ethernet cfm loopback cache – size/hold-time

This command sets maximum value for size and/or hold-time of the loopback cache. The no form of the command sets loopback cache size and/or hold-time to the default value.

```
ethernet cfm loopback cache ([size <entries(1-4096)>] [hold-time <minutes(1-2880)>])
```

```
no ethernet cfm loopback cache ([size] [hold-time])
```

Syntax Description	**size**	-	Maximum number of entries for the loopback replies cache. This value ranges between 1 and 4096.
	hold-time	-	Specifies the time, in minutes, for which loopback replies cache table entries are retained. This value ranges between 1 and 2880 minutes.
Mode	Switch Configuration Mode		
Package	Metro		
Defaults	size	-	1024
	hold-time	-	1440 minutes
Example	`iss(config-switch)# ethernet cfm loopback cache size 10 hold-time 600`		
Related Commands	• **show ethernet cfm loopback cache** – Displays the loopback replies received from remote maintenance end points (MEP)s.		
	• **clear ethernet cfm loopback cache** – Clears the contents of the Loopback Reply Cache.		

29.60 ethernet cfm error-log

This command enables the logging of errors occurred on the device in the Error Log table and also sets the maximum size of the table.

```
ethernet cfm error-log [enable | disable] [size <entries(1-4096)>]
```

Syntax Description	**enable**	-	Enables the logging of Continuity Check errors.
	disable	-	Disables the logging of Continuity Check errors.
	size	-	Specifies the maximum number of entries for the Continuity Check Error Log. This value ranges from 1 to 4096.
Mode	Switch Configuration Mode		
Package	Metro		
Example	`iss(config-switch)# ethernet cfm error-log enable size 1000`		
Related Commands	• **show ethernet cfm error-log** – Displays the information about the errors encountered on MEP.		
	• **clear ethernet cfm error-log** – Clears the contents of the Error Log.		

29.61 ethernet cfm mep-capability

This command enables or disables the capabilities of all the MEPs at the provided level and VLAN. This capabilities include ping, multicast ping frames processing, one way frame-delay frames processing, test frames/signals processing, multicast test frames/signals processing, and processing time inclusion in case of two-way delay measurement.

ethernet cfm mep-capability [enable | disable] {domain <domain-name> | level <a,b,c-d>} [service <service-name> | vlan <a,b,c-d> | service-instance <integer(256-16777214)>] ([ping] [muliticast-ping] [test] [multicast-test] [one-way-frame-delay] [turnaround-delay] [ais] [rdi])

Syntax Description	**enable**	-	Enables the capabilities.
	disable	-	Disables the capabilities.
	domain	-	Identifies the Maintenance Domain. The maximum length of the domain-name is 20.
	level	-	Level at which the Maintenance Domain is defined. The level can be configured with a value between zero and seven.
	service	-	Indicates the service name. The maximum length of the service-name is 20.
	vlan	-	Indicates the VLAN Identifier. The VLAN ID can be given a value between 1 and 4094.
	service-instance	-	Indicates the service instance ID. This value ranges between 256 and 16777214.
	ping	-	Enables/disables option for Ping.
	multicast-ping	-	Enables/disables option for Multicast Ping.
	test	-	Enables/disables option for Test.
	multicast-test	-	Enables/disables option for Multicast test.
	one-way-frame-delay	-	Enables/disables option for One-way-frame-delay.
	turnaround-delay	-	Enables/disables option for Turnaround-delay.
	ais	-	Enables/disables option for AIS.
	rdi	-	Enables/disables option for RDI.
Mode	Switch Configuration Mode		
Package	Metro		
Example	`iss(config-switch)# ethernet cfm mep-capability enable level 4 ais`		
Related Commands	**show ethernet cfm maintenance-points local detail** – Displays the detailed information about the maintenance end points (MEP) locally configured on the device.		

29.62 ethernet cfm vlan-param

This command sets the drop eligiblity and VLAN priority for the CFM PDU(s) transmitted by the MEPs in the specified domain..

```
ethernet cfm vlan-param [{domain <domain_name)> | level <level-id(0-7)>}]
([drop-eligibility {enable | disable}] [vlan-priority <vlan-priority(0-7)>])
```

Syntax Description	**domain**	-	Identifies the domain. Character string has a maximum limit of twenty characters.
	level	-	Level at which the Maintenance Domain is defined. This value ranges from 0 to 7.
	drop-eligibility	-	Enables/disables the Drop eligibility option for the PDU.
	vlan-priority	-	VLAN priority for the PDU. This value ranges from 0 to 7.
Mode	Switch Configuration Mode		
Package	Metro		
Example	`iss(config-switch)# ethernet cfm vlan-param domain tst1 drop-eligibility enable vlan-priority 5`		

29.63 ethernet cfm service-instance-param

This command sets the drop eligiblity and service instance priority for the CFM PDU(s) to be transmitted by the MEPs in the specified domain.

ethernet cfm service-instance-param [{domain <domain_name)> | level <level-id(0-7)>}] ([drop-eligibility {enable | disable}] [service-instance-priority <service-instance-priority(0-7)>])

Syntax Description	**domain**	-	Identifies the domain. Character string has a maximum limit of twenty characters.
	level	-	Level at which the Maintenance Domain is defined. This value ranges from 0 to 7.
	drop-eligibility	-	Enables/disables the Drop eligibility option for the PDU.
	service-instance-priority	-	Service instance priority for the PDU. This value ranges between zero and seven.
Mode	Switch Configuration Mode		
Package	Metro		
Example	`iss(config-switch)# ethernet cfm service-instance-param domain tst1 drop-eligibility enable service-instance-priority 5`		

29.64 set frame delay threshold

This command sets the threshold value for the Frame Delay.

`set frame delay threshold <microseconds(0-4294967295)>`

Mode	MEP Configuration Mode
Package	Metro
Example	`iss(config-ether-mep)# set frame delay threshold 10000`
☞	Notification is sent to management and registered external modules if the frame delay exceeds the configured threshold.
Related Commands	**`show ethernet cfm maintenance-points local detail`** – Displays the detailed information about the maintenance end points (MEP) locally configured on the device.

29.65 set params

This command enables or disables the MEP capability.

```
set params [capability {enable | disable} ([ping] [multicast-ping] [test]
[multicast-test] [one-way-frame-delay] [turnaround-delay])]
```

Syntax Description	**enable**	-	Enables the MEP capability.
	disable	-	Disables the MEP capability.
	ping	-	Enables/disables option for Ping.
	multicast-ping	-	Enables/disables option for Multicast Ping.
	test	-	Enables/disables option for Test.
	multicast-test	-	Enables/disables option for Multicast test.
	one-way-frame-delay	-	Enables/disables option for One-way-frame-delay.
	turnaround-delay	-	Enables/disables option for Turnaround-delay.
Mode	MEP Configuration Mode		
Package	Metro		
Defaults	ping	-	Enabled
	multicast-ping	-	Disabled
	test	-	Enabled
	multicast-test	-	Disabled
	one-way-frame-delay	-	Enabled
	turnaround-delay	-	Disabled
Example	`iss(config-ether-mep)# set params disable ping multicast-ping`		
Related Commands	**show ethernet cfm maintenance-points local detail –** Displays the parameters configured for a particular MEP.		

29.66 set rdi

This command sets the RDI capability and period of the MEP.

```
set rdi ([{enable | disable}] [period <integer(0-172800)>])
```

Syntax Description	**enable**	-	Enables the RDI capability.
	disable	-	Disables the RDI capability.
	period	-	Time, in seconds, for which RDI capability is enabled. This value ranges between 0 and 172800.
Mode	MEP Configuration Mode		
Package	Metro		
Default	enable | disable	-	enable
Example	`iss(config-ether-mep)# set rdi enable period 150`		
Related Commands	**show ethernet cfm maintenance-points local detail** – Displays the parameters configured for a particular MEP.		

29.67 set ais

This command sets the AIS capability on the MEP and also sets the AIS interval and AIS period.

set ais ([{enable | disable}] [interval {one-sec | one-min}] [period <integer(0-172800)>])

Syntax Description	**enable**	-	Enables the AIS capability.
	disable	-	Disables the AIS capability.
	interval	-	Interval between two successive AIS transmissions.
	period	-	Time, in seconds, for which AIS capability is enabled.This value ranges between 0 and 172800.
Mode	MEP Configuration Mode		
Package	Metro		
Default	enable | disable	-	disable
	interval	-	one-sec
Example	`iss(config-ether-mep)# set ais enable interval one-min period 150`		
Related Commands	**show ethernet cfm maintenance-points local detail –** Displays the parameters configured for a particular MEP.		

29.68 set ccm-mac

This command sets the destination MAC address for the Continuity Check Messages. Multicast MAC address will be set according to the level of MEP.

set ccm-mac ({multicast | unicast <aa:aa:aa:aa:aa:aa>})

Syntax Description	**multicast**	-	Multicast MAC address.
	unicast	-	Unicast MAC address.
Mode	MEP Configuration Mode		
Package	Metro		
Example	`iss(config-ether-mep)# set ccm-mac 00:11:22:33:44:55`		
Related Commands	**show ethernet cfm maintenance-points local detail –** Displays the parameters configured for a particular MEP.		

29.69 set client-layer-mac

This command sets the client layer MAC address for the AIS and/or LCK messages.

set client-layer-mac [ais multicast | unicast <aa:aa:aa:aa:aa:aa>] [lck multicast | unicast <aa:aa:aa:aa:aa:aa>]

Syntax Description	**ais multicast**	-	Multicast destination MAC address of the client MEP to which AIS frame is to be sent.
	ais unicast <aa:aa:aa:aa:aa:aa>]	-	Unicast destination MAC address of the client MEP to which AIS frame is to be sent.
	lck multicast	-	Multicast destination MAC address of the client MEP to which LCK frame is to be sent.
	lck unicast <aa:aa:aa:aa:aa:aa>		Unicast destination MAC address of the client MEP to which LCK frame is to be sent.
Mode	MEP Configuration Mode		
Package	Metro		
Example	`iss(config-ether-mep)# set client-layer-mac ais 00:11:22:33:44:55`		
Related Commands	**show ethernet cfm maintenance-points local detail** – Displays the parameters configured for a particular MEP.		

29.70 set frame loss threshold

This command sets the threshold values for near-end and far-end frame loss. Notification is sent to management and registered external modules, if the loss exceeds the configured threshold.

set frame loss threshold ([near-end <num_of_frames(0-4294967295)>] [far-end <num_of_frames(0-4294967295)>])

Syntax Description	**near-end**	-	Threshold value for the near-end frame loss. This value ranges between 0 and 4294967295.
	far-end	-	Threshold value for the far-end frame loss. This value ranges between 0 and 4294967295.
Mode	MEP Configuration Mode		
Package	Metro		
Example	`iss(config-ether-mep)# set frame loss threshold near-end 12345`		
Related Commands	**show ethernet cfm maintenance-points local detail –** Displays the parameters configured for a particular MEP.		

29.71 set out-of-service

This command enables or disables the MEP to perform out-of-service operations. Also, configures the LCK interval, period and delay.

set out-of-service [enable | disable] [interval {one-sec | one-min}] [period <seconds(0-172800)>] [delay <milliseconds(10-100)>]

Syntax Description	**enable**	-	Enables the MEP to perform out-of-service operations.
	disable	-	Disables the MEP to perform out-of-service operations.
	interval	-	Interval between two successive LCK transmissions to be used by the MEP.
	period	-	Time period, in seconds, for which LCK messages are to be transmitted. This value ranges between 0 and 172800 seconds.
	delay	-	Time, in milliseconds, after which data traffic through the MEP will be blocked, when an MEP is set as locked (for out-of-service operations). This value ranges between 10 and 100 milliseconds.
Mode	MEP Configuration Mode		
Package	Metro		
Default	enable | disable	-	disable
	interval	-	one-sec
	delay	-	10
Example	`iss(config-ether-mep)# set out-of-service enable interval one-min period 125 delay 30`		
Related Commands	**show ethernet cfm maintenance-points local detail –** Displays the parameters configured for a particular MEP.		

29.72 set drop-eligibility

This command sets the drop-eligibility of the various CFM PDUs to be transmitted by the MEP.

```
set drop-eligibility {enable | disable} ([all] [ccm] [lbm] [ltm] [one-dm]
[dmm] [lmm] [tst] [ais] [lck])
```

Syntax Description	**enable**	-	Enables drop-eligibility of the CFM PDUs.
	disable	-	Disables drop-eligibility of the CFM PDUs.
	all	-	Enables/disables drop eligibility option for CCM, LBM, LTM, 1 DMM, DMM and LMM.
	ccm	-	Enables/disables drop eligibility option for CCM.
	lbm	-	Enables/disables drop eligibility option for LBM.
	ltm	-	Enables/disables drop eligibility option for LTM.
	one-dm	-	Enables/disables drop eligibility option for 1DMM.
	dmm	-	Enables/disables drop eligibility option for DMM.
	lmm	-	Enables/disables drop eligibility option for LMM.
	tst	-	Enables/disables drop eligibility option for TST.
	ais	-	Enables/disables drop eligibility option for AIS.
	lck	-	Enables/disables drop eligibility option for LCK.
Mode	MEP Configuration Mode		
Package	Metro		
Example	`iss(config-ether-mep)# set drop-eligibility enable ccm lbm ltm`		

29.73 set vlan-priority

This command sets the VLAN priority of the various CFM PDUs to be transmitted by the MEP.

```
set vlan-priority ([all <priority(0-7)>] [ccm <priority(0-7)>] [lbm
<priority(0-7)>] [ltm <priority(0-7)>] [one-dm <priority(0-7)>] [dmm
<priority(0-7)>] [lmm <priority(0-7)>] [tst <integer(0-7)>] [ais <integer(0-
7)>] [lck <integer(0-7)>])
```

Syntax Description

all	-	Priority level for CCM, LBM, LTM, 1 DMM, DMM, LMM, TST, AIS and LCK. This integer value ranges between zero and seven.
ccm	-	Priority level for CCM. This integer value ranges between zero and seven.
lbm	-	Priority level for LBM. This integer value ranges between zero and seven.
ltm	-	Priority level for LTM. This integer value ranges between zero and seven.
one-dm	-	Priority level for 1DMM. This integer value ranges between zero and seven.
dmm	-	Priority level for DMM. This integer value ranges between zero and seven.
lmm	-	Priority level for LMM. This integer value ranges between zero and seven.
tst	-	Priority level for TST. This integer value ranges between zero and seven.
ais	-	Priority level for AIS. This integer value ranges between zero and seven.
lck	-	Priority level for LCK. This integer value ranges between zero and seven.

Mode MEP Configuration Mode

Package Metro

Defaults

ccm	-	7
lbm	-	7
ltm	-	7
one-dm	-	7
dmm	-	7
lmm	-	7
tst	-	7
ais	-	7
lck	-	7

Example

```
iss(config-ether-mep)# set vlan-priority ccm 6 lbm 5 ltm 5 dmm 4
tst 5
```

29.74 set service-instance-priority

This command sets the service instance priority of the various CFM PDUs to be transmitted by the MEP.

```
set service-instance-priority {[all <priority(0-7)>] | {[ccm <priority(0-7)>]
[lbm <priority(0-7)>] [ltm <priority(0-7)>] [one-dm <priority(0-7)>] [dmm
<priority(0-7)>] [lmm <priority(0-7)>] [tst <integer(0-7)>] [ais <integer(0-
7)>] [lck <integer(0-7)>]}}
```

Syntax Description

all	-	Priority level for CCM, LBM, LTM, 1 DMM, DMM, LMM, TST, AIS and LCK. This integer value ranges between zero and seven.
ccm	-	Priority level for CCM. This integer value ranges between zero and seven.
lbm	-	Priority level for LBM. This integer value ranges between zero and seven.
ltm	-	Priority level for LTM. This integer value ranges between zero and seven.
one-dm	-	Priority level for 1DMM. This integer value ranges between zero and seven.
dmm	-	Priority level for DMM. This integer value ranges between zero and seven.
lmm	-	Priority level for LMM. This integer value ranges between zero and seven.
tst	-	Priority level for TST. This integer value ranges between zero and seven.
ais	-	Priority level for AIS. This integer value ranges between zero and seven.
lck	-	Priority level for LCK. This integer value ranges between zero and seven.

Mode MEP Configuration Mode

Package Metro

Defaults

ccm	-	7
lbm	-	7
ltm	-	7
one-dm	-	7
dmm	-	7
lmm	-	7
tst	-	7
ais	-	7
lck	-	7

Example

```
iss(config-ether-mep)# set service-instance-priority ccm 6 lbm 5
ltm 5 dmm 4 tst 5
```

29.75 set one-dm-transaction-interval

This command sets the time interval between two successive one-way frame delay transactions.

set one-dm-transaction-interval <milliseconds(0-15000)>

Mode	MEP Configuration Mode
Package	Metro
Default	0
Example	`iss(config-ether-mep)# set one-dm-transaction-interval 1450`

☞
- The value **0** indicates one-way delay variation measurement cannot take place.
- This value should be greater than the DM Interval.

29.76 show ethernet cfm loopback cache

This command displays the loopback replies received from remote maintenance end points (MEP)s.

show ethernet cfm loopback cache [detail] [domain <domain-name> | level <level-id(0-7)>] [service <service-name> | unaware | vlan <vlan-id(1-4094)> | service-instance <service-instance (256-16777214)>] [switch <context_name>]

Syntax Description

detail	-	For detailed view of the transaction statitics such as average, minimum, and maximum time taken to receive the replies.
domain	-	Identifies the Maintenance Domain. The maximum length of the domain-name is 20.
level	-	Level at which the Maintenance Domain is defined. This value ranges from 0 to 7.
service	-	Indicates the service name. The maximum length of the service-name is 20.
unaware	-	Indicates for VLAN-unaware remote MEP.
vlan	-	Indicates the VLAN Identifier. This value ranges from 1 to 4094.
service-instance	-	Indicates the service instance ID. This value ranges between 256 and 16777214.
switch	-	Context/Switch Name.

Mode User Exec Mode / Privileged EXEC Mode

Package Metro

Example

```
iss# show ethernet cfm loopback cache

Switch default


Switch cust1

 LBR cache configured maximum size : 1024 entries

Interface : gigabitethernet 0/3
MEP-ID    : 1
Level     : 6
VLAN-ID   : 5

ping statistics with 01:80:c2:ff:ff:f6
source mac-address   bytes received    seq no    time to receive
error type
------------------   --------------    ------    ---------------   --
--------
00:01:02:03:04:0b    23                0         880ms
none

packets sent = 1, packets received = 1, packets lost  = 0 (0.000%
loss),
```

```
unexpected received = 0, checksum errors = 0, bad messages received =
0,
duplicate received = 0, responders = 1, average packets per responder
= 1,
rtt min/avg/max = 880/880/880 ms

ping statistics with 00:01:02:03:04:0b
source mac-address   bytes received    seq no    time to receive
error type
------------------   --------------    ------    ---------------   --
--------
00:01:02:03:04:0b    23                0         80ms
none

packets sent = 1, packets received = 1, packets lost  = 0 (0.000%
loss),
unexpected received = 0, checksum errors = 0, bad messages received =
0,
duplicate received = 0, responders = 1, average packets per responder
= 1,
rtt min/avg/max = 80/80/80 ms
```

Related Commands

- **`ethernet cfm loopback cache - size/hold-time`** – Sets maximum value for size and/or hold-time of the Loopback cache.
- **`clear ethernet cfm loopback cache`** – Clears the contents of the Loopback Reply Cache.

29.77 show ethernet cfm maintenance-points local detail

This command displays the detailed information about the maintenance end points (MEP) locally configured on the device. This information includes configured capabilities, counters, lock and AIS state, client-mac address and configured thresholds.

show ethernet cfm maintenance-points local detail {mpid <mep-id(1-8191)> | mac <aa:aa:aa:aa:aa:aa>} [domain <domain_name> | level <level-id(0-7)>] [service <service-name> | unaware | vlan <integer(1-4094)> | service-instance <integer(256-16777214)>] [switch <context_name>]

Syntax Description

mpid	-	Specified maintenance point. This value ranges from 1 to 8191.
mac	-	MAC address.
domain	-	Identifies the maintenance domain. Character string has a maximum limit of twenty characters.
level	-	Level at which the Maintenance Domain is defined. This value ranges from 0 to 7.
service	-	Indicates the service name. The maximum length of the service-name is 20.
unaware	-	Indicates for VLAN-unaware remote MEP.
vlan	-	Indicates the VLAN Identifier. This value ranges from 1 to 4094.
service-instance	-	Indicates a service-instance for the configuration. This value ranges between 256 and 16777214
switch	-	Context/Switch Name.

Mode User Exec Mode / Privileged EXEC Mode

Package Metro

Example

```
iss# show ether cfm maintenance-point local detail mac
00:01:02:03:04:03

Switch default

Switch cust1

------------------------------------------------------------
MPID: 1    MdLevel: 6    VLAN: 5    Dir: Up
------------------------------------------------------------

Client MEG Level                    :  Not Configured
Off-Load Status                     :  Disabled

Out-Of-Service (LCK)
--------------------
Status                              :  Un-Locked(In-Service)
Condition                           :  Does not exist
```

```
Remote Defect Indication (RDI)
------------------------------
Capability                          :  Enabled
Period                              :  Not Configured

Loopback (LB)
-------------
Capability                          :  Enabled
Multicast LBM Reception Capability  :  Disabled

Test Signal (TST)
-----------------
Multicast TST Reception Capability  :  Disabled
TST Capability                      :  Enabled

Alarm Indication Signal (AIS)
-----------------------------
Capability                          :  Disabled
Condition                           :  Does not exist

Delay Measurement (DM)
----------------------
One-Way DM Reception Capability     :  Enabled
One-Way DM Transaction Interval     :  Not Configured
Dmr Optional Fields                 :  Not Included
Delay Threshold                     :  200 microseconds

Frame Loss Measurement (LM)
---------------------------
Near-End Loss Threshold             :  Not Configured
Far-End Loss Threshold              :  Not Configured
```

Related Commands

- **`ethernet cfm mep-capability`** – Enables or disables the capabilities of all the MEPs in a MA at the level and VLAN.
- **`set frame delay threshold`** – Sets the threshold value for the Frame Delay.
- **`show ethernet cfm maintenance-point local`** – Displays the details of all the maintenance points (Maintenance End Point (MEP) or Maintenance Intermediate Point (MIP)) configured on a device.

29.78 show ethernet cfm frame delay buffer

This command displays the contents of the rolling buffer maintained for Frame delay calculations measured at various time. If brief option is provided , then as per transaction statistics such as number of PDUs sent or received, average of delay and delay variation and so on are displayed.

```
show ethernet cfm frame delay buffer [detail] [one-way | two-way] [domain
<domain-name> | level <level-id(0-7)>] [{service <service-name> | unaware |
vlan <vlan-id(1-4094)> | service-instance <service-instance (256-16777214)>}]
[interface <interface-type> <interface-number>] [mac <peer-mac-address>]
[switch <context_name>]
```

Syntax Description	**detail**	-	Describes per transaction statistics in detail with all the statistics.
	one-way	-	Delay measurement calculated at destination end.
	two-way	-	Delay measurement calculated at initiation end.
	domain	-	Identifies the maintenance domain.
	level	-	Level at which the Maintenance Domain is defined. This value ranges from 0 to 7.
	service	-	Indicates the service name. The maximum length of the service-name is 20.
	unaware	-	Indicates for VLAN-unaware remote MEP.
	vlan	-	Indicates the VLAN Identifier. This value ranges from 1 to 4094.
	service-instance	-	Indicates the service instance ID. This value ranges between 256 and 16777214.
	interface-type	-	Type of interface.
	interface-number	-	Interface identifier.
	mac	-	MAC address.
	switch	-	Context/Switch Name
Mode	User Exec Mode / Privileged EXEC Mode		
Package	Metro		

Example

```
iss# show ethernet cfm  frame delay buffer brief

Switch default

Switch 1

Interface : gigabitethernet 0/3
MEP-ID    : 1
Level     : 6
VLAN-ID   : 5

--- 00:01:02:03:04:03 frame delay statistics ---
```

```
measurement timestamp = 14 May 2008 5:55:16, packets sent = 2,
packets received = 2,
frame delay average = 75.0ms, IFDV average = 0.000ms, FDV Average
= 0.000ms
```

Related Commands

- **`ethernet cfm frame delay buffer size`** – Sets the maximum size for the Frame Delay buffer.
- **`ethernet cfm frame delay`** – Starts or stops the delay measurement transaction.
- **`clear ethernet cfm frame delay buffer`** – Clears the contents of the Frame Delay rolling buffer.

29.79 show ethernet cfm error-log

This command displays the contents of error log maintained for the errors encountered on MEP.

```
show ethernet cfm error-log [domain <domain-name> | level <level-id(0-7)>]
[{service <service-name> | unaware | vlan <vlan-id(1-4094)> | service-instance
<service-instance (256-16777214)>}] [switch <context_name>]
```

Syntax Description

domain	-	Identifies the maintenance domain. Character string has a maximum limit of twenty characters.
level	-	Level at which the Maintenance Domain is defined. This value ranges from 0 to 7.
service	-	Indicates the service name. The maximum length of the service-name is 20.
unaware	-	Indicates for VLAN-unaware remote MEP.
vlan	-	Indicates the VLAN Identifier. This value ranges from 1 to 4094.
service-instance	-	Indicates the service instance ID. This value ranges between 256 and 16777214.
switch	-	Context/Switch Name

Mode User Exec Mode / Privileged EXEC Mode

Package Metro

Example

```
iss# show ethernet cfm errors

Switch default

Switch 1

MEP-ID :  1
Level VLAN RMEP-ID   Current defect type
----- ---- -------   -------------------
6     5    4         remote defect indication
6     5    2         loss of continuity
6     5    3         loss of continuity

Switch 2

MEP-ID :  4
Level VLAN RMEP-ID   Current defect type
----- ---- -------   -------------------
6     5    1         remote defect indication
6     5    2         loss of continuity
6     5    3         loss of continuity
6     5    5         loss of continuity
```

Related Commands

- **ethernet cfm error-log** – Enables the logging of Continuity Check errors occurred on the device in the Error Log table and also sets the maximum size of the table.

- **`clear ethernet cfm error-log`** – Clears the contents of the Error Log.

29.80 show ethernet cfm frame loss buffer

This command displays the contents of rolling buffer maintained for frame-loss computation measured at various times. . If brief option is provided, then per transaction statistics such as number of PDUs sent or received, average of near-end and far-end loss will be displayed.

```
show ethernet cfm frame loss buffer [detail] [single-ended | dual-ended]
[domain <domain-name> | level <level-id(0-7)>] [{service <service-name> |
unaware | vlan <vlan-id (1-4094)> | service-instance <service-instance (256-
16777214)>}] [interface <interface-type> <interface-number>] [mac <peer-mac-
address>] [switch <context_name>]
```

Syntax Description

detail	-	Describes per transaction statistics in detail with all the statistics.
single-ended	-	Loss measurement calculated at destination end.
dual-ended	-	Loss measurement calculated at initiation end.
domain	-	Identifies the maintenance domain.
level	-	Level at which the Maintenance Domain is defined. This integer value ranges between zero and seven.
service	-	Indicates the service name. The maximum length of the service-name is 20.
vlan-id	-	Indicates the VLAN Identifier. This integer value ranges between 1 and 4094.
service-instance	-	Indicates the service instance ID. This value ranges between 256 and 16777214.
interface type	-	Specifies the interface type .
Interface number	-	Specifies the interface number
unaware	-	Indicates for VLAN-unaware remote MEP.
mac peer-mac-address	-	Indicates the MAC Address. MAC address of the remote maintenance point is in the format: xx:xx:xx:xx:xx:xx.
Switch	-	Context/ Switch Name

Mode User Exec Mode / Privileged EXEC Mode

Package METRO

Example

```
iss# show ethernet cfm frame loss buffer

Switch default

Switch 1

 FL Buffer maximum size configured : 1024
```

```
Interface : gigabitethernet 0/2
MEP-ID    : 1
Level     : 6
VLAN-ID   : 5

peer mac-address    near-end loss  far-end loss
measurement time taken
-----------------   -------------  ------------   -------
---------------
00:01:02:03:04:0e   0              0              90ms
00:01:02:03:04:0e   1              1              90ms
00:01:02:03:04:0e   1              1              90ms
00:01:02:03:04:0e   1              1              90ms

--- 00:01:02:03:04:02 single-ended frame loss statistics
---
timestamp = 29 Oct 2008 20:38:5, packets sent = 4,
packets received = 4,
near-end loss max/avg/min = 1/0/0,
far-end loss max/avg/min = 1/0/0
```

Related Commands

- **`ethernet cfm frame loss buffer size`** - Sets the maximum size for the frame loss buffer.
- **`clear ethernet cfm frame loss buffer`** - Clears the frame loss rolling buffer

29.81 clear ethernet cfm statistics

This command clears the statistic counters of ECFM.

```
clear ethernet cfm statistics [interface <type> <num> [domain <domain-name> |
level <level-id(0-7)>] [service <service-name> | vlan <vlan-id(1-4094)> |
service-instance <service-instance (256-16777214)>]] [switch <context_name>]
```

Syntax Description	**interface**	-	Specifies the interface type and interface identifier.
	domain	-	Identifies the maintenance domain.
	level	-	Level at which the Maintenance Domain is defined. This value ranges from zero to seven.
	service	-	Indicates the service name. The maximum length of the service-name is 20.
	vlan	-	Indicates the VLAN Identifier. This value ranges from 1 to 4094.
	service-instance	-	Indicates the service instance ID. This value ranges between 256 and 16777214.
	switch	-	Context/Switch Name
Mode	User Exec Mode / Privileged EXEC Mode		
Package	Metro		
Example	`iss# clear ethernet cfm statistics`		
Related Commands	**show ethernet cfm statistics** – Displays the Ethernet CFM statistics.		

29.82 clear ethernet cfm frame delay buffer

This command clears the contents of the Frame Delay rolling buffer.

clear ethernet cfm frame delay buffer [switch <context_name>]

Syntax Description	**switch**	- Context/Switch Name.
Mode	User Exec Mode / Privileged EXEC Mode	
Package	Metro	
Example	`iss# clear ethernet cfm frame delay buffer`	
Related Commands	• **ethernet cfm frame delay buffer size** – Sets the maximum size for the Frame Delay buffer. • **ethernet cfm frame delay** – Starts or stops the delay measurement calculations. • **show ethernet cfm frame delay buffer** – Displays the contents of the rolling buffer maintained for Frame delay calculations measured at various time.	

29.83 clear ethernet cfm loopback cache

This command clears the contents of the Loopback Reply Cache.

```
clear ethernet cfm loopback cache [switch <context_name>]
```

Syntax Description	**switch**	-	Context/Switch Name.
Mode	User Exec Mode / Privileged EXEC Mode		
Package	Metro		
Example	`iss# clear ethernet cfm loopback cache`		
Related Commands	• **ethernet cfm loopback cache – size/hold-time** – Sets maximum value for size and/or hold-time of the Loopback cache. • **show ethernet cfm loopback cache** – Displays the loopback replies received from remote maintenance end points (MEP)s. • **ping ethernet mpid** – Sends the unicast or multicast loopback messages.		

29.84 clear ethernet cfm error-log

This command clears the contents of the Error Log.

```
clear ethernet cfm error-log [switch <context_name>]
```

Syntax Description	**Domain**	- Context/Switch Name

Mode	User Exec Mode / Privileged EXEC Mode
Package	Metro
Example	iss# clear ethernet cfm error-log

Related Commands

- **ethernet cfm error-log** – Enables the logging of Continuity Check errors occurred on the device in the Error Log table and also sets the maximum size of the table.
- **show ethernet cfm error-log** – Displays the information about the errors encountered on MEP.

29.85 clear ethernet cfm frame loss buffer

This command clears the contents of the frame loss rolling buffer.

clear ethernet cfm frame loss buffer[switch <context_name>]

Syntax Description	**switch**	-	Context/Switch Name

Mode User Exec Mode / Privileged EXEC Mode

Package Metro

Example
```
iss# clear ethernet cfm frame loss buffer
```

Related Commands

- **ethernet cfm frame loss buffer size** - Sets the maximum size for the frame loss buffer.
- **show ethernet cfm frame loss buffer** - Displays the contents of rolling buffer maintained for frame-loss computation measured at various times.

29.86 ethernet cfm offload

This command enables CCM Offloading on all the MEPs in the system. The no form of the command disables CCM Offloading on all the MEPs on the device.

ethernet cfm offload

no ethernet cfm offload

Mode	Global Configuration Mode
Package	Metro
Defaults	By default, the CCM Offloading is disabled on all the MEPs.
Example	`iss(config)#ethernet cfm offload`
Related Commands	**set ethernet cfm offload** – Enables or disables the CCMOffloading for the MEP.

29.87 set ethernet cfm offload

This command enables or disables the CCMOffloading on the MEP.

`set ethernet cfm offload {enable | disable }`

Syntax Description	**`enable`**	- Enables the CCMOffloading for the MEP.
	`disable`	- Disables the CCMOffloading for the MEP.
Mode	MEP Configuration Mode	
Package	Metro	
Defaults	disable	

Example

```
iss(config-ether-mep)# set ethernet cfm Offload enable
```

Related Commands **`ethernet cfm offload`** – Enables CCM Offloading on all the MEPs in the system.

Chapter 30

IPSecv6

IPSecv6 (Internet Protocol Security Version 6) refers to a set of protocols developed by IETF to support secure exchange of packets at the IPv6 layer.

Ipsecv6 supports two encryption modes: Transport and Tunnel. Transport mode encrypts only the data portion (payload) of each packet, but leaves the header untouched. The more secure Tunnel mode encrypts both the header and the payload. On the receiving side, an IPSecv6-compliant device decrypts each packet.

For Ipsecv6 to work, the sending and receiving devices must share a public key.

The list of CLI commands for the configuration of IPSecv6 is as follows:

- crypto ipsecv6
- ipsecv6 admin
- ipsecv6 sa
- ipsecv6 sa proto
- v6access-list
- ipsecv6 policy
- ipsecv6 selector
- delete ipsecv6
- ipsecv6 trace
- show ipsecv6 stat
- show ipsecv6
- show ipsecv6 config

30.1 crypto ipsecv6

This command moves the control into the Crypto Transform Configuration mode.

`crypto ipsecv6`

Mode	Global Configuration Mode
Package	Enterprise and Metro
Example	`iss(config)# crypto ipsecv6`

30.2 ipsecv6 admin

This command enables/disables IPSecv6 administratively.

`ipsecv6 admin <enable|disable>`

Syntax Description	**`enable`**	-	Enables IPSecvc6
	`disable`	-	Disables IPSecvc6
Mode	Crypto Transform Configuration Mode		
Package	Enterprise and Metro		
Defaults	enable		
Example	`iss(config-crypto)# ipsecv6 admin disable`		
Related Command	• **`show ipsecv6 config`** – Displays the global values of IPSecv6		

30.3 ipsecv6 sa

This command creates a Security Association Entry with the configured parameters.

ipsecv6 sa <sa-index> <peeraddress> <spi> {transport|tunnel} [antireplay-enable]

Syntax Description	**sa-index**	-	Index to the SA table
	peeraddress	-	Peer Address
	spi	-	Security Policy Index
	transport	-	Transport Mode of Security
	tunnel	-	Tunnel Mode of Security
	antireplay-enable	-	Rekeying of Tunnel

Mode Crypto Transform Configuration Mode

Package Enterprise and Metro

Example

```
iss(config-crypto)# ipsecv6 sa  101  4444::1111 444 transport
```

Related Command

- **show ipsecv6** – Displays a single entry or all the entries of the IPSecv6 Policy Table/Selector Table/Security Association Table/Access Table

30.4 ipsecv6 sa proto

This command updates the security association entry with Algorithm and Keys.

ipsecv6 sa proto <sa-index> {ah | esp} [auth {null | md5 | keyedmd5 <key> | hmacmd5 <key> | hmacsha1 <key>}] [encr {null | des-cbc <espkey> | 3des-cbc <espkey> <espkey2> <espkey3>]|aes<espkey>}]

Syntax Description

sa-index	-	Index to the SA table
ah	-	Authentication Header
esp	-	Encapsulated Security Payload
auth	-	Authentication for AH

- **null** - AH Algorithm is Null
- **md5** - AH Algorithm is Message-digest 5
- **keyedmd5** - AH Algorithm is Keyed Message-digest 5
- **hmacmd5** - AH Algorithm is Hashing Algorithm - for Message Digest 5
- **hmacsha1** - AH Algorithm is Hashing Algorithm - for Secure Hash Algorithm

encr - Encryption for ESP

- **null** - ESP Algorithm is Null
- **md5** - ESP Algorithm is Data Encryption Standard - Cipher Block Chaining
- **keyedmd5** - ESP Algorithm is Triple DES-CBC
- **aes** – ESP Algorithm is Advances Encryption Standard

Mode Crypto Transform Configuration Mode

Package Enterprise and Metro

Example

```
iss(config-crypto)#  ipsecv6  sa proto 101  ah  auth hmacsha1
12345678123456781234567812345678123456 78
```

☞ Security association entry must have been created using the ipsecv6 sa command.

Related Commands

- **ipsecv6 sa** –Creates a Security Association Entry with the configured parameters
- **show ipsecv6** – Displays a single entry or all the entries of the IPSecv6 Policy Table/Selector Table/Security Association Table/ Access Table

30.5 v6access-list

This command creates Access List with the configured parameters.

```
v6access-list <accesslist-index> {<any> |<src-netmask> <src-addr>} {<any> |
<dest-netmask> <dest-addr>}
```

Syntax Description

accesslist-index	-	Accesslist Index
any	-	Any Source IP Address
src-netmask	-	Source Net mask
src-addr	-	Source address
any	-	Any Destination IP Address
dest-netmask	-	Destination Net mask
dest-addr	-	Destination Address

Mode Crypto Transform Configuration Mode

Package Enterprise and Metro

Example

```
iss(config-crypto)# v6access-list  1  128 4444::1111  128
4444::2222
```

☞ IPSecv6 must have been disabled administratively prior to the execution of this command

Related Commands

- **no ipsecv6 admin** – Disables IPSecv6 administratively
- **show ipsecv6** –Displays a single entry or all the entries of the IPSecv6 Policy Table/Selector Table/Security Association Table/Access Table

30.6 ipsecv6 policy

This command creates a policy entry and maps the same to the Security Association Entry.

```
ipsecv6 policy <policyindex> {apply|bypass} {manual|automatic} <sa-index>
```

Syntax Description	**policyindex**	-	Policy Index
	apply	-	Applies the policy
	bypass	-	Bypass the policy
	manual	-	Manual Configuration of the Policy
	automatic	-	Automatic Configuration of the Policy
	sa-index	-	Index to the SA table

Mode Crypto Transform Configuration Mode

Package Enterprise and Metro

Example

```
iss(config-crypto)# ipsecv6  policy 1  apply  manual 101
```

☞ IPSecv6 must be disabled administratively prior to the execution of this command

Related Commands

- **no ipsecv6 admin** – Disables IPSecv6 administratively
- **show ipsecv6** – Displays a single entry or all the entries of the IPSecv6 Policy Table/Selector Table/Security Association Table/Access Table

30.7 ipsecv6 selector

This command creates Selector Entry and Maps it to the Access List and Policy List Entry.

```
ipsecv6 selector {vlan <id>|tunnel <id>|any} {tcp|udp|icmpv6|ah|esp|any}
{<port-no>|any} {inbound|outbound|any} <accesslist-index> <policy-index>
{filter|allow} [{LocalTunnelIP}]
```

Syntax Description

vlan	-	VLAN Interface Identifier
tunnel	-	Tunnel Interface Identifier
any	-	Selector entry that can be used for any Interface
tcp	-	Transmission Control Protocol
udp	-	User Datagram Protocol
icmpv6	-	Internet Control Message Protocol v6 Protocol
ah	-	Authentication Header
esp	-	Encapsulating Security Payload
any	-	Selector entry that can be used for any Protocol
port-no	-	Port Number
any	-	Selector entry can be used for packets on any port
inbound	-	Inward Direction of Packet flow
outbound	-	Outward Direction of Packet flow
any	-	Any Direction
accesslist-index	-	Accesslist Index
policy-index	-	Policy Index
filter	-	Filters the packets
allow	-	Allows the packets
LocalTunnelIP	-	Local Tunnel IP address

Mode Crypto Transform Configuration Mode

Package Enterprise and Metro

Example

```
iss(config-crypto)# ipsecv6 selector  vlan 1  any  any inbound
1  1  allow
```

☞ IPSecv6 must be disabled administratively prior to the execution of this command

Related Commands

- **no ipsecv6 admin** – Disables IPSecv6 administratively
- **show ipsecv6** – Displays a single entry or all the entries of the IPSecv6 Policy Table/Selector Table/Security Association Table/Access Table

30.8 delete ipsecv6

This command deletes a single or all the entries of the Security Association, Access, Policy or Selector list.

```
delete ipsecv6 {policy|selector|sa|access} [index <num_str>]
```

Syntax Description

policy	-	Deletes the entry from the policy table
selector	-	Deletes the entry from the selector table
sa	-	Deletes the entry from the Security Association Table
access	-	Deletes the entry from the Access List Table
index	-	Index of the respective table

Mode Crypto Transform Configuration Mode

Package Enterprise and Metro

Example

```
iss(config-crypto)# delete ipsecv6 policy
```

☞ This command deletes the specified entry when index value is specified. Otherwise the entire table is deleted.

Related Command

- **show ipsecv6** – Displays the entries of the configured list - - IPSecv6 Policy Table, IPSecv6 selector table, Security association table, IPSecv6 Access Table

30.9 ipsecv6 trace

This command sets the Trace levels in IPSecv6.

`ipsecv6 trace <trace option mask>`

Mode Privileged EXEC Mode

Package Enterprise and Metro

Example

```
iss# ipsecv6 trace 0x00000002
```

☞ The different trace levels association with IPSecv6 are as follows:

0x00000001	INIT_SHUT
0x00000002	MGMT
0x00000004	DATA_PATH
0x00000008	CONTROL_PLANE
0x00000010	DUMP
0x00000020	OS_RESOURCE
0x00000040	ALL_FAILURE
0x00000080	BUFFER
0x00001000	MUST

Related Command

- **`show ipsecv6 config`** –Displays the global values of IPSecv6

30.10 show ipsecv6 stat

This command displays the IPSecv6 statistics of the security packets over an Interface. It is also used to display AH or ESP or Intruder packet related statistics.

show ipsecv6 stat <if|ah-esp|intruder>

Syntax Description	**if**	-	Interface Identifier
	ah-esp	-	Authentication or Encryption Statistics
	intruder	-	Intruder Statistics
Mode	Privileged EXEC Mode		
Package	Enterprise and Metro		

Example

```
iss# show ipsecv6 stat ah-esp

IPSec AH Specific Statistics
Iface InAh OutAh AllowAh DiscrdAh
----- ---- ----- ------ --------
12     0     5     5     0
IPSec Esp Specific Statistics
Iface InEsp OutEsp AllowEsp DiscrdEsp
----- ----- ------ ------- ---------
12     0     5     5        0

iss# show ipsecv6 stat if

IPSec Interface Specific Statistics
Iface InPkts OutPkts SecuredPkts Discarded Bypassed
----- ----- -------- ---------- --------- --------
12       0      25      10         0        15
```

30.11 show ipsecv6

This command displays the entries of the configured list - - IPSecv6 Policy Table, IPSecv6 selector table, security association table, IPSecv6 Access Table.

show ipsecv6 {policy|selector|sa|access} [index <num_str>]

Syntax Description

policy	-	Policy Table
selector	-	Selector Table
sa	-	Security Association Table
access	-	Access Table
index	-	Index Value

Mode Privileged EXEC Mode

Package Enterprise and Metro

Example

```
iss# show ipsecv6 access

IPSec Access Table
  1      4444::1111      128      4444::2222      128
  2      4444::2222      128      4444::1111      128

iss# show ipsecv6 policy

IPSec Policy Table
     1       APPLY      MANUAL  2.1
     2       APPLY      MANUAL  4.3


iss# show ipsecv6 selector

IPSec Selector Table

IPSec Selector Table
 Position of entry in List:    1
     12    ANY    ANY     IN      1      1   allow
 Position of entry in List:    2
     12    ANY    ANY    OUT      2      2   allow

iss# show ipsecv6 sa
```

```
IPSec SecAssoc Table
1  0x14d   4444::2222  TRANSPORT  AR_DISABLE  AH  HmacSha

2  0x1bc   4444::2222  TRANSPORT  AR_DISABLE  ESP NULL 3DES-CBC

3  0x29a   4444::1111  TRANSPORT  AR_DISABLE  AH  MD5

4  0x378   4444::1111  TRANSPORT  AR_DISABLE  ESP  NULL DES-CBC
```

Related Commands

- **`ip secv6 sa –`** Creates a Security Association Entry with the configured parameters
- **`ip secv6 sa proto –`** Updates the security association entry with Algorithm and Keys
- **`v6access-list`** – Creates Access List with the configured parameters
- **`ipsecv6 policy –`** Creates a policy entry and maps the same to the Security Association Entry
- **`ipsecv6 selector –`** Creates Selector Entry and Maps it to the Access List and Policy List Entry
- **`delete ipsecv6`** – Deletes the entries of the configured list
- **`show ipsecv6 stat`** – Displays the IPSecv6 statistics of Interface/AH/ESP/Intruder

30.12 show ipsecv6 config

This command displays the global values of IPSecv6.

`show ipsecv6 config`

Mode Privileged EXEC Mode

Package Enterprise and Metro

Example

```
iss# show ipsecv6 config

IPSec Global Configurations
IPSec AdminStatus : ENABLE
IPSec Trace Level : DISABLE-ALL
IPSec Version     : 6
IPSec Max SA      : 100
```

Related Command

- **`ipsecv6 admin`** – Enables/disables IPSecv6 Administratively

Chapter 31

VRRP

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 - 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 interface - vrid
- show vrrp interface

31.1 router vrrp

This command enables VRRP in the router and is used to enter the VRRP Configuration Mode. The no form of the command disables VRRP in the router.

router vrrp

no router vrrp

Mode	Global Configuration Mode
Package	Enterprise and Metro
Defaults	VRRP is disabled.
Example	`iss(config)# router vrrp`

☞ Enabling the VRRP router will transition the state of the virtual router from 'initialize' to 'backup' or 'master' (Initialize indicates that the virtual router is waiting for a startup event. Backup indicates that the virtual router is monitoring the availability of the master router Master indicates that the virtual router is forwarding the packets for IP addresses that are associated with this router.). Disabling the VRRP router will transition the state from 'backup' or 'master' to 'initialize'. State transitions may not be immediate but may depend on other factors such as the interface state.

Related Commands

- **show vrrp interface – vrid** – Displays the VRRP status information
- **vrrp group shutdown** – Shuts down all VRRP groups

31.2 interface

This command selects an interface to configure. The no form of the command deletes the virtual router entries on the given Interface.

```
interface { vlan <vlan-id (1-4094)> | <interface-type> <interface-id> }
```

```
no interface { Vlan <vlan-id (1-4094)> | <interface-type> <interface-id> }
```

Syntax Description	**vlan-id**	-	VLAN Identifier
	interface-type		Interface Type
	interface-id		Interface Identifier
Mode	VRRP Router Configuration Mode		
Package	Enterprise and Metro		
Example	`iss(config-vrrp)# interface vlan 3`		

☞

Related Commands

- VRRP must be enabled prior to the execution of this command
- This interface must have an ip address prior to the execution of this command
- **router vrrp** – Enables VRRP in the router
- **show vrrp interface – vrid** – Displays the VRRP status information
- **show vrrp interface** - Displays the VRRP status information

31.3 vrrp - ipv4 address

This command sets the associated IP addresses for the virtual router. The no form of the command deletes the associated IP addresses for the virtual router.

```
vrrp <vrid(1-255)> ipv4 <ucast_addr > [secondary]

no vrrp <vrid(1-255)> ipv4[<ucast_addr>[secondary]]
```

Syntax Description

vrid	-	Virtual Router ID. This value ranges between 1 and 255.
ucast_addr	-	Unicast address
secondary	-	Secondary IP addresses

Mode VRRP Interface Configuration Mode

Package Enterprise and Metro

Example

```
iss(config-vrrp-if)# vrrp 3 ipv4 10.0.0.1
```

☞

- VRID is a number which along with an interface index uniquely identifies a virtual router on a given VRRP router
- Once this command is executed, 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 should precede any other interface command for this vrid.

Related Commands

- **router vrrp** – Enables VRRP in the router
- **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

31.4 vrrp – ip address

This command sets the associated IP addresses for the virtual router.

This command is a complete standardized implementation of the existing command and operates similar to that of the command vrrp - ipv4 address.

```
vrrp <vrid(1-255)> ip <ucast_addr> [secondary]
```

Syntax Description

vrid	-	Virtual Router ID. VRID is a number which along with an interface index uniquely identifies a virtual router on a given VRRP router. This value ranges between 1 and 255.
ucast_addr	-	Unicast address
secondary	-	Secondary IP addresses

Mode VRRP Interface Configuration Mode

Package Enterprise and Metro

Example

```
iss(config-vrrp-if)# vrrp 3 ip 10.0.0.1
```

- Once this command is executed, 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 should precede any other interface command for this vrid.

Related Commands

- **router vrrp** – Enables VRRP in the router
- **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

31.5 vrrp group shutdown

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.

vrrp group shutdown

Mode	VRRP Interface Configuration Mode
Package	Enterprise and Metro
Example	`iss(config-vrrp-if)# vrrp group shutdown`
Related Commands	• **router vrrp** – Enables VRRP in the router • **show vrrp interface – vrid** – Displays the VRRP status information • **show vrrp interface** - Displays the VRRP status information

31.6 vrrp - priority

This command sets the priority for the virtual router. The no form of the command sets the priority for the virtual router to default value.

vrrp <vrid(1-255)> priority <priority(1-254)>

no vrrp <vrid(1-255)> priority

Syntax Description	**vrid**	-	Virtual Router ID
	priority	-	Priority used for the virtual router master election process
Mode	VRRP Interface Configuration Mode		
Package	Enterprise and Metro		
Defaults	priority	–	100
Example	`iss(config-vrrp-if)# vrrp 3 priority 7`		

☞

- Higher values imply higher priority
- A priority of 255 is used for the router that owns the associated IP address (es)
- The command **vrrp <vrid(1-255)> ipv4 <ip address>** must be entered for the current interface (with the proper vrid) before the execution of this command

Related Commands

- **router vrrp** – Enables VRRP in the router
- **show vrrp interface – vrid** – Displays the VRRP status information

31.7 vrrp - preempt

This command enables the pre-emption of state change from either Backup to Master or vice versa based on the election process. The no form of the command disables the preempt mode.

```
vrrp <vrid(1-255)> preempt [delay minimum <integer(0-30)]

no vrrp <vrid(1-255)> preempt
```

Syntax Description	**vrid**	-	Virtual Router ID
	delay minimum	-	Number of seconds that the router will delay before issuing an advertisement claiming master ownership. This value ranges between 0 and 30. This feature has been included to adhere to the Industry Standard CLI syntax. This feature is currently not supported.

Mode VRRP Interface Configuration Mode

Package Enterprise and Metro

Defaults Pre-emption is enabled.

delay minimum - 0

Example

```
iss(config-vrrp-if)# vrrp 3 preempt
```

☞ The command **vrrp <vrid(1-255)> ipv4 <ip address>** must be entered for the current interface (with the proper vrid) before the execution of this command.

Related Commands

- **router vrrp** – Enables VRRP in the router
- **vrrp – ipv4 address / vrrp – ip address** – Sets the IP address for the virtual router
- **show vrrp interface – vrid** – Displays the VRRP status information
- **show vrrp interface** - Displays the VRRP status information

31.8 vrrp - text-authentication

This command sets the authentication type for the virtual router to simple password. The no form of the command sets the authentication type for the virtual router to none.

vrrp <vrid(1-255)> text-authentication <password>

no vrrp <vrid(1-255)> text-authentication

Syntax Description	**vrid**	-	Virtual Router ID. This value ranges between 1 and 255.
	password	-	Authentication password used to validate the incoming VRRP packets
Mode	VRRP Interface Configuration Mode		
Package	Enterprise and Metro		
Example	`iss(config-vrrp-if)# vrrp 3 text-authentication abcdefgh`		

☞

- The authentication password can be alphanumeric characters up to 8 digits
- The command **vrrp <vrid(1-255)> ipv4 <ip address>** must be entered for the current interface (with the proper vrid) before the execution of this command

Related Commands

- **router vrrp** – Enables VRRP in the router
- **vrrp - ipv4 address / vrrp - ip address** – Sets the IP address for the virtual router
- **show vrrp interface - vrid** – Displays the VRRP status information

31.9 vrrp - authentication text

This command sets the authentication type for the virtual router to simple password.

This command operates similar to that of the command vrrp - text-authentication.

`vrrp <vrid(1-255)> authentication text <password>`

Syntax Description	**`vrid`**	- Virtual Router ID. This value ranges between 1 and 255.
	`password`	- Authentication password used to validate the incoming VRRP packets
Mode	VRRP Interface Configuration Mode	
Package	Enterprise and Metro	
Example	`iss(config-vrrp-if)# vrrp 3 authentication text abcdefgh`	

☞

- The authentication password can be alphanumeric characters up to 8 digits
- The command **`vrrp <vrid(1-255)> ipv4 <ip address>`** must be entered for the current interface (with the proper vrid) before the execution of this command

Related Commands

- **`router vrrp`** – Enables VRRP in the router
- **`vrrp - ipv4 address / vrrp - ip address`** – Sets the IP address for the virtual router
- **`show vrrp interface - vrid`** – Displays the VRRP status information

31.10 vrrp - interval

This command sets the advertisement timer for a virtual router. The no form of the command sets the advertisement timer for a virtual router to default value.

vrrp <vrid(1-255)> timer <interval(1-255)secs>

no vrrp <vrid(1-255)> timer

Syntax Description	**vrid**	-	Virtual Router ID. This value ranges between 1 and 255.
	timer	-	The time interval, in seconds, between successive advertisement messages. This value ranges between 1 and 255.

Mode VRRP Interface Configuration Mode

Package Enterprise and Metro

Defaults 1 second

Example
```
iss(config-vrrp-if)# vrrp 4 timer 6
```

- Only the master router sends advertisements
- On expiry of the advertise timer, the Master sends advertisement packets to the Backup
- The command **vrrp <vrid(1-255)> ipv4 <ip address>** must be entered for the current interface (with the proper vrid) before the execution of this command

Related Commands

- **router vrrp** – Enables VRRP in the router
- **vrrp - ipv4 address / vrrp - ip address** – Sets the IP address for the virtual router
- **show vrrp interface - vrid** – Displays the VRRP status information

31.11 vrrp - timers advertise

This command sets the advertisement timer for a virtual router.

This command operates similar to that of the command vrrp - interval.

vrrp <vrid(1-255)> timers advertise [msec] <interval(1-255)secs>

Syntax Description

vrid	-	Virtual Router ID. This value ranges between 1 and 255.
msec	-	Unit of advertisement time is changed from seconds to milliseconds.
interval	-	The time interval, in seconds, between successive advertisement messages. This value ranges between 1 and 255. This feature has been included to adhere to the Industry Standard CLI syntax. This feature is currently not supported.

Mode VRRP Interface Configuration Mode

Package Enterprise and Metro

Defaults 1 second

Example

```
iss(config-vrrp-if)# vrrp 3 timers advertise 100
```

☞

- Only the master router sends advertisements
- On expiry of the advertise timer, the Master sends advertisement packets to the Backup
- The command **vrrp <vrid(1-255)> ipv4 <ip address>** must be entered for the current interface (with the proper vrid) before the execution of this command

Related Commands

- **router vrrp** – Enables VRRP in the router
- **vrrp – ipv4 address / vrrp – ip address** – Sets the IP address for the virtual router
- **show vrrp interface – vrid** – Displays the VRRP status information

31.12 show vrrp interface - vrid

This command displays the VRRP status information.

```
show vrrp [interface { vlan <VlanId(1-4094)> | <interface-type> <interface-id>
} <VrId(1-255)>] [{brief|detail |statistics}]
```

Syntax Description	**interface vlan**	-	VRRP information on the given VLAN ID and VRID
	brief	-	Information about VRRP in brief
	detail	-	Information about VRRP in detail
	statistics	-	VRRP statistics
	VrId		Virtual Router ID
	interface-type		Interface Type
	interface-id		Interface Identifier
Mode	Privileged EXEC Mode		
Package	Enterprise and Metro		

Example

```
iss# 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 :
 ----------------------
  12.0.0.1
  Advertise time is 1 secs
  Current priority is 255
  Configured priority is 255, may preempt

iss# show vrrp interface vlan 2 brief
```

```
P indicates configured to preempt

Interface   vrID Priority  P  State   Master    VRouter
                                        Addr     Addr
---------   ---- --------  -  -----   -------  -------
vlan2       1    100       P  Master  local    12.0.0.2
vlan2       2    255       P  Master  local    12.0.0.1

iss# 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
Invalid Type Packets Received  : 0
Address List Errors            : 0
Invalid Authentication Type    : 0
Authentication Type Mismatch   : 0
Packet Length Errors           : 0

iss# show vrrp interface vlan 2

P indicates configured to preempt

Interface   vrID Priority  P  State   Master    VRouter
                                        Addr     Addr
---------   ---- --------  -  -----   -------  -------
vlan2       1    100       P  Master  local    12.0.0.2
vlan2       2    255       P  Master  local    12.0.0.1
```

This command can be executed with the VlanId as the mandatory parameter.

Related Commands

- **`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

31.13 show vrrp interface

This command displays the VRRP status information.

```
show vrrp interface [{ vlan <VlanId(1-4094)> | <interface-type> <interface-id>
}] [{brief|detail |statistics}]
```

Syntax Description	**interface vlan**	-	VRRP information on the given VLAN ID
	brief	-	Information about VRRP in brief
	detail	-	Information about VRRP in detail
	statistics	-	VRRP statistics
	interface-type	-	Interface Type
	interface-id	-	Interface Identifier
Mode	Privileged EXEC Mode		
Package	Enterprise and Metro		

Example

```
iss# 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 Commands

- **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