APPENDIX C

Pseudo Command Line Interface Reference

This chapter describes Pseudo-IOS command line interface (PCLI) for GE_XP, 10GE_XP, GE_XPE, and 10GE_XPE cards.

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

C.1 Understanding PCLI

PCLI provides an IOS-like command line interface for GE_XP, 10GE_XP, GE_XPE, and 10GE_XPE cards in Layer 2 (L2) mode. PCLI employs the Cisco IOS Modular QoS CLI (MQC).

PCLI is a text interface from where you can operate, provision and retrieve GE_XP, 10GE_XP, GE_XPE, and 10GE_XPE card information. PCLI runs on the Timing, Communications, and Control (TCC) of the node controller, to access card level information. PCLI acts as a Corba client and provides the same provisioning mechanisms as CTC or TL1. PCLI can be accessed via CTC by selecting **Tools > Open Pseudo IOS Connection** menu option or right-click on the node in the Network View and select **Open Pseudo IOS Connection**. To access the PCLI text interface use Telnet, or SSH to open a shell session to connect to a GE_XP, 10GE_XP, GE_XPE, or 10GE_XPE card and input IOS-like commands.

To access PCLI from Windows XP, enter the following command at the Windows command prompt:

```
telnet <node name> <port number>
```

To access PCLI from Solaris 8, enter the following command:

```
ssh -p <Port Number> <Node Name>
telnet <Node Name> <Port Number>
```

The PCLI shell supports the 454 multi-shelf architecture. Multi-shelf supports 16 shelves with each shelf containing 17 slots. The GE_XP, 10GE_XP, GE_XPE, or 10GE_XPE cards can be inserted in any Input/Output (IO) slot or shelf. PCLI also provides a command to virtually connect to a specified shelf/slot. However, connection to a non-Xponder slot or to an Xponder slot that is not in L2 mode is not supported. PCLI supports a maximum of 16 concurrent login sessions per node controller. A session can be cancelled by logging out of the PCLI session or when the idle timer times out.

Note PCLI adheres to the idle user timeout period security policy set via CTC or TL1.

Note For information on viewing security policies, refer the task, "DLP-G189 Change Security Policy for Multiple Nodes" in the *Cisco ONS 15454 DWDM Procedure Guide.*

If a PCLI session on a node using a given port number is open, the port number used by the PCLI session cannot be changed. When connecting in a Non-Secure state to a node and a port, use the configured port number for non-secured mode only, and when connecting via a Secure state to a node and a port, use the configured port number for Secure mode.

C.1.1 PCLI Security

PCLI supports configurable secure or unsecure access with a configurable port number per access mechanism. Use CTC to view or modify these settings. The default access state is "Non-secure" and the default port number is "65000".

PCLI supports an unsecured connection via Telnet and a secure connection via Secure Shell (SSH) by using existing system authentication, authorization and accounting (AAA) mechanisms. Login with user/password that is configured at the Network Element (NE). Use CTC or TL1 to manage user accounts.

Note If you have logged in to a PCLI connection in an Non-Secure state and change the connection via CTC to a Secure one (or vice versa), the Non-Secure state in PCLI (or Secure, as the case may be) is closed once the CTC configuration is completed.

For information on setting the access states (Non-secure or Secure), refer *Cisco ONS 15454 DWDM Procedure Guide*.

C.2 PCLI Command Modes

The PCLI supports eight different command modes. Each command mode can be accessed by specifying a command. The prompt changes to reflect the new command mode that you are in. Consequently, the set of valid commands changes to reflect the sub-commands that are allowed within that mode.

The following section shows supported PCLI commands for each command mode.

C.2.1 Common Commands

The following commands are common across all command modes.

- ?—Enter a question mark (?) at the system prompt to display a list of commands available in each command mode.
- !— Enter an exclamation symbol (!) at the system prompt to add comments.
- exit—Enter exit at the system prompt to exit from the mode you are currently in.

C.2.2 User EXEC Mode

Prompt: (>)

After a successful login, the system goes to User Executive (EXEC) command mode. Most PCLI commands in the User EXEC mode do not change system operation. The User EXEC mode allows you to work on multiple GE_XP, 10GE_XP, GE_XPE, and 10GE_XPE cards during a single session while restricting the view at any given time to a single card in a specific shelf and slot. This mode displays system wide parameters that span all cards in the node.

The following commands are supported in the User EXEC mode:

- enable shelf/slot
- show modules
- show users

C.2.3 Privileged EXEC Mode

Prompt: (#)

In general, the Privileged EXEC commands allow you to connect to remote devices, perform basic tests, and lists system information. Most CLI commands in Privileged EXEC mode do not change or modify provisioning and system operation. The most common EXEC commands are show commands and are used to display configuration or operational data, and do not have capability to modify provisioning.

To enter privileged EXEC mode, use the enable shelf/slot command.

The following commands are part of Privileged EXEC mode:

- configure terminal
- reload
- show startup-config
- show users
- show ip igmp snooping groups vlan vlanid
- show interfaces
- show ethernet service instance name
- show vlan profiles
- show vlans
- show modules
- show controllers type port
- show history
- show policy-maps
- show policy-map name
- show policy-map type port

C.2.4 Global Configuration Mode

Prompt: Node Name# (Config)

Enter global configuration mode from privileged EXEC mode. Global configuration commands generally apply to the whole system rather than just one protocol or interface. You can enter other configuration sub modes listed in this section from global configuration mode.

To enter global configuration mode, use the configure terminal command.

Note The node name can be configured by using CTC. Select **Node view > General > General > Node Name**

The following commands are part of global configuration mode:

- mac-address-table learning vlan vlanid
- [no] mac-address-table learning interface type port
- [no] vlan vlan-id
- interface gigabitethernet port
- interface tengigabitethernet port
- policy-map name
- [no] mvr
- mvr vlan
- mvr group ip address count

C.2.5 VLAN Configuration Mode

Prompt: (config-vlan)

Enter VLAN configuration mode from global configuration mode. You can configure parameters for an individual VLAN.

To enter VLAN configuration mode, use the **vlan <vlanid>** command.

The following commands are part of VLAN configuration mode:

- name vlan name
- protected
- ip igmp snooping
- ip igmp snooping immediate-leave
- ip igmp snooping report-suppression

C.2.6 Interface Configuration Mode

Prompt: (config-if)

Enter interface configuration mode from global configuration mode. In this mode and other interface sub modes, a wide variety of capabilities are supported. You can configure provisioning on a specific module interface, i.e. port.

To enter interface configuration mode, use the interface gigabitethernet port or interface tengigabitethernet port command.

The following commands are part of interface configuration mode:

- description description
- shutdown
- mtu bytes

- speed auto|1000, 10000
- flowcontrol on|off
- switchport mode trunk
- switchport mode dot1q-tunnel
- service-policy input name
- service-policy output name
- service instance ethernet name
- l2protocol-tunnel
- [no] switchport port-security mac-address mac-address
- ip igmp snooping mrouter

C.2.7 Service Instance Configuration Mode

Prompt: (config-if-srv)

Service instance configuration mode is a sub mode of the interface configuration mode and can be used to define service instances, i.e. Ethernet Flow Points (EFPs). EFPs are specific to a particular interface. Multiple EFPs can be strung together to make an Ethernet Virtual Circuit (EVC).

The encapsulation commands can be used in any combination to implement flexible EFPs. However, the **dot1q** and **untagged** commands must be used for selective mode translations, and the **default** command must be used for transparent mode translations. The following restrictions apply to encapsulation commands:

- Selective and transparent mode apply to a whole port and are mutually exclusive.
- Encapsulation default is for transparent translations. Only one transparent service instance is allowed per port.
- Encapsulation untagged is for selective translation with no *cvlan* tag. If the operation is DOUBLE_ADD (**rewrite ingress tag push dot1q** <*multipurpose vlan*> *second-dot1q* <*svlan*>), only one service instance is allowed per port.

To enter service instance configuration mode, use the service instance ethernet name command.

The following commands are part of service instance configuration mode:

- encapsulation default
- encapsulation dot1q first cvlan last cvlan
- encapsulation untagged
- service-policy input name
- bridge-domain svlan

Note The encapsulation and rewrite commands are work together. These commands take effect only if the following sequence is followed:

1. Enter the encapsulation command.
2. Enter the rewrite command.

Note A service instance cannot be edited once user exits the service instance configuration mode. To make changes to any of these parameters, delete the service instance and recreate it.

C.2.8 Policy Map Configuration Mode

Prompt: (config-pmap)

Enter policy map configuration mode from global configuration mode by using the **policy-map** command to create a policy map or modify an existing policy map. This mode is part of the quality-of-service (QoS) feature.

To attach a QoS policy to a specific interface, you must enter interface configuration mode from global configuration mode by identifying the interface and then using the service-policy command to attach an existing policy. QoS policy map provisioning can be accessed across multiple GE_XP, 10GE_XP, GE_XPE, and 10GE_XPE cards.

To enter policy map configuration mode, enter the policy-map name command from the global config mode.

The following commands are part of policy map configuration mode:

- police cir percent % bc bytes be bytes
- set cos number
- wrr-queue cos-map queue-id cos1 … cosn
- wrr-queue queue-id weight 1-16 bandwidth percent %

C.2.9 VLAN Profile Config Mode

Prompt: (config-profile)

VLAN profile configuration mode can be used to provision the parameters for a VLAN profile. A VLAN profile can later be applied to multiple VLANs. VLAN profile provisioning can be accessed across multiple GE cards.

To enter VLAN profile configuration mode, use the vlan profile *name* command from the global config mode.

The following commands are part of VLAN profile configuration mode:

- police cir percent % bc bytes be bytes

enable *shelf/slot*

To enter privileged EXEC mode, use the **enable** command in user EXEC mode.

enable *shelf/slot*

Syntax Description

shelf/slot	Shelf and slot number.

Command Modes

User EXEC

Usage Guidelines

Use this command to enter privileged configuration mode. Entering privileged EXEC mode enables the use of privileged commands. Note the prompt for user EXEC mode is the greater than symbol (>), and the prompt for privileged EXEC mode is the hash symbol (#).

Examples

```
MSTP-176> enable 2/12
MSTP-176#
```

configure terminal

To enter global configuration mode, use the **configure terminal** command in privileged EXEC mode.

configure terminal

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Usage Guidelines

Use this command to enter global configuration mode.

After you enter the **configure terminal** command, the system prompt changes from `<node-name>#` to `<node-name>(config)#`, indicating that the card is now in global configuration mode. To leave global configuration mode and return to privileged EXEC mode, type `exit`.

Examples

```
MSTP-176# configure terminal
MSTP-176(config)#
```

show modules

To display summary information (shelf/slot/port, equipment type, service state) of the GE_XP, 10GE_XP, GE_XPE, or 10GE_XPE card, use the **show modules** command in User EXEC and privileged EXEC mode.

show modules

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values.

Command Modes

User EXEC and Privileged EXEC

Examples

The following is sample output of the **show modules** command:

```
MSTP-176# show modules
Shelf/Slot/Port        EquipType              ServiceState
    1/NA/NA              BIC_UNKNOWN              IS-NR
    1/1 /NA           XP_GE_LINE_CARD             IS-NR
    1/1 /1                PPM_1_PORT     OOS-AU,AINS&UEQ
    1/1 /2                PPM_1_PORT     OOS-AU,AINS&UEQ
    1/1 /8                PPM_1_PORT     OOS-AU,AINS&UEQ
    1/1 /9                PPM_1_PORT     OOS-AU,AINS&UEQ
    1/1 /11               PPM_1_PORT              IS-NR
    1/1 /15               PPM_1_PORT              IS-NR
    1/1 /16               PPM_1_PORT     OOS-AU,AINS&UEQ
MSTP-176#
```

show vlans

To display VLAN information, use the **show vlans** command in privileged EXEC mode.

show vlans

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values

Command Modes

Privileged EXEC

Examples

The following is sample output of the **show vlans** command which shows the status of 1+1 protection, MAC address learning, IGMP snooping, immediate leave, and report suppression on the GE_XP, 10GE_XP, GE_XPE, or 10GE_XPE card for a given VLAN.

```
MSTP-176# show vlans
                                      IGMP
VLAN Name Prot MAC Learn   Enable Immed Suppress
2          F    F            F     F     T
50         F    F            F     F     F
100        F    F            T     F     T
101        F    F            F     F     T
MSTP-176#
```

show interfaces

To display port level parameters and statistics of interfaces configured on the GE_XP, 10GE_XP, GE_XPE, or 10GE_XPE, use the **show interfaces** command in privileged EXEC mode.

show interfaces

Syntax Description

This command has no arguments or keywords.

Defaults

Privileged EXEC

Examples

The following is sample output of the **show interfaces** command. The output in the example depends on the type and number of interfaces in the card. For this reason only a part of the output is shown.

```
MSTP-176# show interfaces
Port 22 (Trunk),  Port name:
Admin State: ADMIN_IS, Service State: IS_NR
Reach: LR, Wavelength: WV_1310, AIS Action: NONE
Flow Control: DISABLED, Duplex Mode: FULL, Speed: SPEED_10G, MTU: 9700
NI Mode: NNI, MAC Learning: DISABLED, IGMP Static Router Port: DISABLED
Ingress CoS: 0, Ethertype Inner/Outer: 8100/8100, Egress QoS: DISABLED
Committed Info Rate: 100, Burst Size Committed/Excess: BCKT_4K/BCKT_4K
ifInOctets: 196928,  rxTotalPkts: 2896, ifInUcastPkts: 0
ifInMulticastPkts: 2896, ifInBroadcastPkts: 0
ifInDiscards: 0, ifOutOctets: 448072424, txTotalPkts: 132911365
ifOutMulticastPkts: 132911359, ifOutBroadcastPkts: 0
ifOutDiscards: 0, ifOutErrors: 0
dot3StatsAlignmentErrors: 0, dot3StatsFCSErrors: 0
dot3StatsFrameTooLong: 0, dot3StatsControlInUnknownOpCodes: 0
dot3StatsInPauseFrames: 0, dot3StatsOutPauseFrames: 0
etherStatsUndersizePkts: 0, etherStatsFragments: 0
etherStatsPkts: 132914261, etherStatsPkts64Octets: 0
65-127 Octets: 132914247, 128-255 Octets: 0
256-511 Octets: 0, 512-1023 Octets: 0
1024-1518 Octets: 0, 1519-1522: 0
etherStatsBroadcastPkts: 0, etherStatsMulticastPkts: 132914255
etherStatsOversizePkts: 0, etherStatsJabbers: 0
etherStatsOctets: 448269352, etherStatsCRCAlignErrors: 0
etherStatsOctets: 448269352, etherStatsCRCAlignErrors: 0
ifHCInOctets: 196928, ifHCInUcastPkts: 0
ifHCInMulticastPkts: 2896, ifHCInBroadcastPkts: 0
ifHCOutOctets: 448072424, ifHCOutMulticastPkts: 132911359
ifHCOutBroadcastPkts: 0, etherStatsHighCapacityPkts: 132914261
etherStatsHighCapacityOctets: 448269352
etherStatsHighCapacityPkts64Octets: 0
etherStatsHighCapacityPkts65to127Octets: 132914247
etherStatsHighCapacityPkts128to255Octets: 0
etherStatsHighCapacityPkts256to511Octets: 0
etherStatsHighCapacityPkts512to1023Octets: 0
etherStatsHighCapacityPkts1024to1518Octets: 0
cisRxReports: 2854, cisRxLeaves: 2
cisTxReports: 0, cisTxLeaves: 2
cisTxGeneralQueries: 2251, cisTxGroupSpecificQueries: 6
cisRxGeneralQueries: 35, RxGroupSpecificQueries 5
cisRxValidPackets: 2896, cisRxInvalidPackets: 0
MSTP-176#
```

show policy-maps

To display all policy maps in the node, use the **show policy-maps** command.

Syntax Description

This command has no arguments or keywords.

Defaults

Privileged EXEC

Examples

The following example displays all the policy maps on the GE_XP, 10GE_XP, GE_XPE, or 10GE_XPE cards:

```
MSTP-176# show policy-map
Policy Name: port1
Policy Type: SERVICE INSTANCE
CoS: 2

Policy Name: cos3
Policy Type: INGRESS
Ingress CoS: 3   Committed Info Rate: 80   Committed Burst Size: 1
Excess Burst Size: 2 Excess Info Rate: 100
MSTP-176#
```

show policy-map *name*

To display the information of an unnamed class, use the **show policy-map** command in privileged EXEC mode.

show policy-map *name*

Syntax Description

name	(Optional) The name of the service policy map whose complete configuration is to be displayed. The name can be a maximum of 31 characters.

Defaults

Existing policy map configurations are displayed.

Command Modes

Privileged EXEC

Examples

The **show policy-map** command displays the configuration of a service policy map that was created using the policy-map name command.

The following example displays the contents of policy map “pmapegress” on the GE_XP, 10GE_XP, GE_XPE, or 10GE_XPE card:

```
MSTP-176# show policy-maps pmapegress
Policy Name: pmapegress
Policy Type: EGRESS
CoS: 0     Queue: 0   Bandwidth: 15   Weight: 1
CoS: 1     Queue: 1   Bandwidth: 100   Weight: 1
CoS: 2     Queue: 2   Bandwidth: 100   Weight: 1
CoS: 3     Queue: 3   Bandwidth: 100   Weight: 1
CoS: 4     Queue: 4   Bandwidth: 100   Weight: 1
CoS: 5     Queue: 5   Bandwidth: 100   Weight: 1
CoS: 6     Queue: 6   Bandwidth: 100   Weight: 1
CoS: 7     Queue: 7   Bandwidth: 100   Weight: 1
MSTP-176#
```

show policy-map *type port*

To display all the policy maps configured on the port, use the **show policy-map type port** in privileged EXEC mode.

show policy-map *type port*

Syntax Description

type port	Interface type and port number.

Command Default

This command has no default behavior or values.

Command Modes

Privileged EXEC

Usage Guidelines

The **show policy-map type port** command displays the configuration of classes on the specified interface.

Examples

This section provides sample output of a typical **show policy-map type port** command. The output in the example depends on the type, number of interfaces and options enabled on the card. For this reason only a part of the output is shown and may vary.

```
MSTP-176# show policy-map int g 1
Policy Name: ingress
Policy Type: INGRESS
Ingress CoS: 3   Committed Info Rate: 50   Committed Burst Size: 4K
Excess Burst Size: 4K

Policy Name: new
Policy Type: EGRESS
CoS: 0     Queue: 0   Bandwidth: 100   Weight: 1
CoS: 1     Queue: 1   Bandwidth: 90   Weight: 2
CoS: 2     Queue: 0   Bandwidth: 100   Weight: 1
CoS: 3     Queue: 3   Bandwidth: 100   Weight: 1
CoS: 4     Queue: 4   Bandwidth: 100   Weight: 1
CoS: 5     Queue: 5   Bandwidth: 100   Weight: 1
CoS: 6     Queue: 6   Bandwidth: 100   Weight: 1
CoS: 7     Queue: 7   Bandwidth: 100   Weight: 1
MSTP-176#
```

show controllers *type port*

To display information about Small Form-factor Pluggable (SFP) installed, use the **show controllers *type port*** command in privileged EXEC mode.

show controllers *type port*

Syntax Description

type port	Interface type and port number.

Defaults

No defaults

Command Modes

Privileged EXEC

Examples

This section provides sample output of a typical **show controllers *type port*** command.

```
MSTP-176# show controllers g 2
Port 22 SFP is Present
Equipment Type                   : 1GE/1FC/2FC-1310nm
HW Part Number                   : 10-2273-01
HW Revision                      : A
Serial Number                    : FNS1032J435
CLEI Code                        : WMOTB17AAA
Product ID                       : ONS-SE-G2F-LX
Version ID                       : V01
```

MSTP-176#

show vlan profiles

To display the parameters of all configured VLANs or one VLAN (if the VLAN ID or name is specified), use the **show vlan profiles** command in privileged EXEC mode.

Note A vlan profile is a named set of vlan attributes. A profile can be associated to a VLAN ID on an interface. A profile can be attached to multiple vlan/interface pairs.

show vlan profiles

Command Modes

Privileged EXEC

Examples

The following example shows the output of the **show vlan profiles** command:

```
MSTP-176# show vlan profiles
Name           CIR BC    PIR BE    LinkIntegrity
a_profile      100 4     100 4           F
d_profile      200 4     100 4           T
e_profile      300 4     100 4           F
v_profile      400 4     100 4           T

MSTP-176#
```

show vlan profiles *name*

To display the parameters of all configured VLANs or one VLAN (if the VLAN ID or name is specified), use the **show vlan profiles *name*** command in privileged EXEC mode.

Syntax Description

name	Displays information about a single VLAN identified by VLAN name.

Note A vlan profile is a named set of vlan attributes. A profile can be associated to a VLAN ID on an interface. A profile can be attached to multiple vlan/interface pairs.

Command Modes Privileged EXEC

Examples The following example shows the output of the **show vlan profiles *name*** command:

```
MSTP-176# show vlan profiles a_profile
Name           CIR BC    PIR BE    LinkIntegrity
a_profile      100 4     100 4           F
```

show ethernet service instance *name*

To display information about ethernet customer service instances, use the **show ethernet service instance *name*** command in privileged EXEC mode.

show ethernet service instance *name*

Syntax Description

name	Displays service instance information of the specified service instance.

Command Modes

Privileged EXEC

Usage Guidelines

This command is useful for system monitoring and troubleshooting.

Examples

The following is an example of output from the **show ethernet service instance** command:

```
MSTP-176# show ethernet service instance
Identifier Interface               CE-Vlans
222        FastEthernet0/1       untagged,1-4093
10         FastEthernet0/2
222        FastEthernet0/2       200
333        FastEthernet0/2       default
10         FastEthernet0/3       300
11         FastEthernet0/3
10         FastEthernet0/4       300
10         FastEthernet0/6       untagged,1-4093
10         FastEthernet0/7       untagged,1-4093
10         FastEthernet0/8       untagged,1-4093
10         FastEthernet0/9       untagged
20         FastEthernet0/9
222        FastEthernet0/11      300-350,900-999
333        FastEthernet0/11      100-200,1000,1999-4093
222        FastEthernet0/12      20
333        FastEthernet0/12      10
10         FastEthernet0/13      10
20         FastEthernet0/13      20
30         FastEthernet0/13      30
200        FastEthernet0/13      222
200        FastEthernet0/14      200,222
300        FastEthernet0/14      333
555        FastEthernet0/14      555
```

show users

To display information about the active users on the node, use the **show users** command in user EXEC or privileged EXEC mode.

show users

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC or Privileged EXEC

Usage Guidelines

This command displays user name, security level, aaplications users are using and login time of all users on the node.

Examples

The following is a sample output of the **show users** command:

```
MSTP-176# show users
User1, SUPERUSER, PCLI, loginTime:05.13.2000  10:08:29
User2, SUPERUSER, EMS, loginTime:05.13.2000  10:05:27
User3, SUPERUSER, EMS, loginTime:05.13.2000  09:39:35
User4, SUPERUSER, EMS, loginTime:05.13.2000  07:35:18
MSTP-176#
```

reload

To reset a card, use the **reload** command in privileged EXEC mode.

reload

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Usage Guidelines

This command resets the card that is currently used.

Examples

The following is a sample output of the **reload** command:

```
MSTP-176> reload
Warning! Resetting this card may impact traffic.
Please confirm (yes/no): n
Command cancelled.

MSTP-176>
```

show history

To list the commands you have entered in the current session (in all modes), use the **show history** command.

show history

Syntax Description

This command has no arguments or keywords.

Command Modes

All modes

Usage Guidelines

The **show history** command provides a record of commands you have entered. The history buffer records 100 commands.

The **show history** command can be used with the help of certain keys as shown in Table C-1.

Table C-1 History Keys

Card	Port Description
Ctrl-P or Up Arrow1[1]	Recalls commands in the history buffer in a backward sequence, beginning with the most recent command. Repeat the key sequence to recall successively older commands.
Ctrl-N or Down Arrow[1]	Returns to more recent commands in the history buffer after recalling commands with Ctrl-P or the Up Arrow. Repeat the key sequence to recall successively more recent commands.

1. The arrow keys function only with ANSI-compatible terminals.

Examples

The following is a sample output from the **show history** command, which lists the commands the user has entered in privileged EXEC mode for this session:

```
MSTP-176# show history
help
show users
show history
MSTP-176#
```

show startup-config

To display the current configuration of the GE_XP, 10GE_XP, GE_XPE, or 10GE_XPE card, use the **show startup-config** command in privileged EXEC mode. The start-up config and the running-config are the same.

show startup-config

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command Default

No defaults

Examples

The following partial sample output displays the configuration file named startup-config:

```
MSTP-176# show startup-config

interface tengigabitethernet 22
speed 10000
mtu 9700
flowcontrol off
switchport mode trunk
switchport dot1q ethertype 8100
switchport dot1q ethertype inner 8100
no ip igmp snooping mrouter
switchport port-security mac-address blocked
no l2protocol-tunnel
link integrity action none
service instance ethernet
no shutdown

vlan profile a
no link integrity
police cir percent 100 pir percent 100 bc 4 be 4

no mac-address-table learning interface gigabitethernet 11
no mac-address-table learning interface gigabitethernet 13
no mac-address-table learning interface tengigabitethernet 21
no mac-address-table learning interface tengigabitethernet 22
end
MSTP-176#
```

show ip igmp snooping groups vlan *vlanid*

To display the multicast groups that were learned through Internet Group Management Protocol (IGMP) on a given SVLAN/MVLAN, use the **show ip igmp groups vlan *vlanid*** in privileged EXEC mode.

show ip igmp groups vlan *vlanid*

Syntax Description

vlanid	VLAN ID range is 1 to 4093.

Command Modes

Privileged EXEC

Command Default

No defaults.

Examples

The following partial sample output displays the multicast groups for VLAN 10:

```
MSTP-176# show ip igmp sn gr vlan 128
MCAST IP ADDR                    VLAN    Ports
224.1.1.1                        128     ETHER(99)/SH-1/SL-13/PRT-2
224.1.1.2                        128     ETHER(99)/SH-1/SL-13/PRT-2
224.1.1.3                        128     ETHER(99)/SH-1/SL-13/PRT-2

MSTP-176#
```

mac-address-table learning vlan *vlanid*

Use the **mac-address-table learning vlan** global configuration command to enable MAC address learning on a VLAN. Use the no form of this command to disable MAC address learning on a VLAN to control which VLANs can learn MAC addresses.

mac-address-table learning vlan *vlanid*

no mac-address-table learning vlan <vlanid>

Syntax Description

vlanid	VLAN ID range is 1 to 4093.

Command Modes

Global configuration

Command Default

By default, MAC address learning is disabled on all VLANs.

Usage Guidelines

Customers in a service provider network can tunnel a large number of MAC addresses through the network and fill the available MAC address table space. When you control MAC address learning on a VLAN, you can manage the available MAC address table space by controlling which VLANs, and therefore which ports, can learn MAC addresses.

Examples

An example to enable MAC address learning on VLAN 10 is shown:

```
MSTP-176# mac-address-table learning vlan 10
MSTP-176#
```

[no] mac-address-table learning interface *type port*

Use the **mac-address-table learning interface *type port*** global configuration command to specify interface based learning of MAC addresses.

Syntax Description

type/port	Interface type, and the port number.

Command Modes

Global configuration

Command Default

None

Usage Guidelines

None

Examples

This example shows how to enable MAC-address learning on an interface:

```
MSTP-176# mac-address-table learning interface gig 1
MSTP-176#
```

[no] vlan *vlan-id*

To add a VLAN and enter config-VLAN submode, use the vlan command. Use the no form of this command to delete the VLAN.

vlan *vlan-id*

Syntax Description

vlan-id	VLAN ID.

Command Modes

Global configuration

Command Default

None

Usage Guidelines

None

Examples

This example shows how to add a new VLAN and to enter config-VLAN submode:

```
MSTP-176# (config)# vlan 2
MSTP-176# (config-vlan)#
```

interface gigabitethernet *port*

To enter gigabit ethernet (GigE) interface configuration, use the **interface gigabitethernet** command in the appropriate configuration mode.

interface gigabitethernet *port*

Syntax Description

port	Enter port number 1-20.

Command Modes

Global configuration

Command Default

Usage Guidelines

Examples

This example shows how to enter Gigabit Ethernet interface on port 2:

```
MSTP-176(config)# interface gigabitethernet 2
MSTP-176(config-if)#
```

interface tengigabitethernet *port*

To enter ten gigabit ethernet (10 GigE) interface configuration, use the **interface tengigabitethernet** command in the appropriate configuration mode.

interface tengigabitethernet *port*

Syntax Description

port	Enter port number 21-22.

Command Modes

Global configuration

Command Default

Usage Guidelines

Examples

This example shows how to enter 10GigE interface on port 21:

```
MSTP-176(config)# interface tengigabitethernet 21
MSTP-176(config-if)#
```

policy-map *name*

To configure the Quality of Service (QoS) policy map, use the **policy-map** command. Use the no form of this command to delete a policy map.

policy-map name

[no] policy-map name

Syntax Description

name	Policy map name.

Command Modes

Global configuration

Command Default

None

Usage Guidelines

None

Examples

This example shows how to create a QoS policy for ingress traffic on an interface command:

```
MSTP-176(config)# policy map pmap
MSTP-176(config-pmap)# police cir percent 60 pir percent 80 bc 4 be 16
MSTP-176(config-pmap)# set cos 8
MSTP-176(config-pmap)# service-policy input servpol1
MSTP-176# end
```

[no] mvr

Use the **mvr** global configuration command to enable the multicast VLAN registration (MVR) feature on the GE_XP, 10GE_XP, GE_XPE, and 10GE_XPE. Use the **[no] mvr** form of this command to disable MVR and its options.

mvr group ip-address vlan *vlan-id*

[no] mvr group ip-address vlan *vlan-id*

Command Modes

Global Configuration

Command Default

MVR is disabled by default.

Usage Guidelines

A maximum of 256 MVR multicast groups can be configured on the GE_XP, 10GE_XP, GE_XPE, and 10GE_XPE. MVR can be enabled only after the multi-group address and VLAN are configured.

Examples

This example shows how to configure 228.1.23.4 as an IP multicast address:

```
MSTP-176(config)# mvr group 228.1.23.4
```

This example shows how to set VLAN 2 as the multicast VLAN:

```
MSTP-176(config)# mvr vlan 2
```

This example shows how to enable MVR:

```
MSTP-176(config)# mvr
```

This example shows how to disable MVR:

```
MSTP-176(config)# no mvr
```

mvr vlan

To specify the VLAN (SVLAN) to act as a multicast VLAN, use the **mvr vlan** command. All ports must belong to this VLAN.

mvr vlan *svlan*

Syntax Description

svlan	SVLAN ID.

Command Modes

Global Configuration

Command Default

By default MVR is disabled on a SVLAN.

Usage Guidelines

None

Examples

This example shows how to set a VLAN to act as the multicast VLAN:

```
MSTP-176(config)# mvr vlan 22
```

mvr group *ip address count*

To configure an IP multicast address on the GE_XP, 10GE_XP, GE_XPE, or 10GE_XPE card, use the *count* parameter to configure a contiguous series of MVR group addresses. Any multicast data sent to this address is sent to all source ports on the switch and all receiver ports that have elected to receive data on that multicast address. Each multicast address would correspond to one television channel.

mvr group *ip address count*

Syntax Description

count	The range for *count* is 1 to 256.

Command Modes

Global Configuration

Command Default

By default MVR is disabled on a SVLAN.

Examples

This example shows how to configure two contiguous MVR address groups.

```
MSTP-176(config)# mvr group 228.1.23.4 2
```

name vlan *name*

To configure the VLAN, use the **name <vlan name>** command.

name vlan *name*

Syntax Description

name	Specify the name of the VLAN.

Command Modes

VLAN interface configuration

Command Default

By default, no name is assigned to a VLAN.

Usage Guidelines

Names with blank spaces can be provided by enclosing the name within double quotes.

Examples

The following example shows how to set the VLAN name:

```
MSTP-176(config-vlan)# name MYVLAN
```

protected

To enables or disable Fast Automatic Protection Switching (FAPS) on the specified SVLAN, use the protected command.

protected

[no] protected

Syntax Description

This command has no arguments or keywords.

Command Modes

VLAN interface configuration

Command Default

By default, FAPS is disabled on all SVLANs.

Examples

The following example shows how to configure the card for protection:

```
MSTP-176(config-vlan)# protected
```

ip igmp snooping

To enable IGMP snooping, use the **ip igmp snooping** command. Use the no form of this command to disable IGMP snooping.

ip igmp snooping

no ip igmp snooping

Syntax Description This command has no arguments or keywords.

Command Default By default, IGMP snooping is disabled on all SVLANs.

Command Modes VLAN interface configuration

Usage Guidelines Before you can enable IGMP snooping configure the VLAN interface for multicast routing.

Examples This example shows how to enable IGMP snooping:

```
MSTP-176(config-vlan)# ip igmp snooping
MSTP-176(config-vlan)#
```

ip igmp snooping immediate-leave

To enable IGMPv2 snooping immediate-leave processing on all existing VLAN interfaces, use the **ip igmp snooping immediate-leave** command. Use the no form of this command to disable immediate-leave processing.

ip igmp snooping immediate-leave

no ip igmp snooping immediate-leave

Syntax Description

This command has no arguments or keywords.

Defaults

By default, IGMP snooping immediate leave is disabled on all SVLANs.

Command Modes

VLAN interface configuration

Usage Guidelines

The immediate-leave feature is supported only with IGMP version 2.

Examples

This example shows how to enable IGMP immediate-leave processing:

```
MSTP-176(config-vlan)# ip igmp snooping immediate-leave
MSTP-176(config-vlan)#
```

ip igmp snooping report-suppression

To enable report suppression, use the **ip igmp snooping report-suppression** command. Use the no form of this command to disable report suppression and forward the reports to the multicast devices.

ip igmp snooping report-suppression

no igmp snooping report-suppression

Syntax Description

This command has no arguments or keywords.

Defaults

By default, IGMP snooping report-suppression is disabled on all SVLANs.

Command Modes

VLAN interface configuration

Examples

This example shows how to enable report suppression:

```
MSTP-176(config-vlan)# ip igmp snooping report-suppression
MSTP-176(config-vlan)#
```

This example shows how to disable report suppression:

```
MSTP-176(config-vlan)# )# no ip igmp snooping report-suppression
MSTP-176(config-vlan)#
```

description *description*

To specify the port name, use the **description** command in interface configuration mode.

description

Syntax Description

description	Port name can be a maximum of 32 characters

Command Modes

Interface configuration

Usage Guidelines

To view the ports on an interface, use the show interfaces command in privilege mode.

Examples

This example shows how to specify a port name:

```
MSTP-176(config-if)# description 5p
```

The following partial sample output displays the port name that was set:

```
MSTP-176# show interface

Port 2 (Client),  Port name: 5p
Admin State: ADMIN_OOS_DSBLD, Service State: OOS_MA_DSBLD
Reach: REACH_UNKNOWN, Wavelength: WV_UNKNOWN, AIS Action: NONE
Flow Control: DISABLED, Duplex Mode: FULL, Speed: SPEED_AUTO, MTU: 9700
NI Mode: UNI, MAC Learning: DISABLED, IGMP Static Router Port: DISABLED
Ingress CoS: 0, Ethertype Inner/Outer: 8100/8100, Egress QoS: DISABLED
Committed Info Rate: 100, Burst Size Committed/Excess: BCKT_4K/BCKT_4K
Failed to get PM counters for this port

MSTP-176#
```

shutdown

To disable a port use the **shutdown** command. Use the **no shutdown** command to enable the port. This command can be executed only by administrators.

shutdown

no shutdown

Syntax Description

This command has no arguments or keywords.

Command Modes

Interface configuration

Examples

This example shows how to shutdown traffic on vlan 2:

```
MSTP-176(config-if)# shutdown vlan 2
```

mtu *bytes*

To set the maximum frame size that will be accepted by the port, use the **mtu** command.

To enable jumbo frames on an interface by adjusting the maximum transmission unit (MTU), use the **mtu** command.

mtu <bytes>

Syntax Description

bytes	Byte size; Valid values are 64-9700.

Defaults

By default, jumbo frames are disabled. The default mtu value is 9700

Command Modes

Interface configuration

Usage Guidelines

Login as an administrator and make sure that the port is down administratively to make this setting.

Examples

This example shows how to specify an MTU of 1800 bytes:

```
MSTP (config)# interface GigabitEthernet 2
MSTP (config-if)# mtu 1800
```

speed *auto/1000, 10000*

To enable auto negotiation or to set the speed manually, use the **speed** command in interface configuration mode.

Syntax Description

auto	Enables Fast Ethernet auto negotiation. The interface automatically operates at 1000 Mbps or 10000 Mbps depending on environmental factors, such as the type of media and transmission speeds for the peer cards, hubs, and switches used in the network configuration. Auto negotiation is the default.

Command Modes

Interface configuration

Usage Guidelines

The speed of client and trunk ports of GE_XP, 10GE_XP, GE_XPE, and 10GE_XPE can be set accordingly:

Table C-2 Setting speed values

Card	Ports	Speed
GE_XP and GE_XPE	Client ports 1 to 20	auto 1000 Mbps
GE_XP and GE_XPE	Trunk ports 21 and 22	10000
10 GE-XP and 10 GE_XPE	Trunk ports 1 to 4	10000

Examples

The following example specifies 1000 Mbps operation:

```
MSTP-176(config-if)# speed 1000
```

flowcontrol on|off

To set a gigabit ethernet interface to send or receive pause frames, use the **flowcontrol** ON or OFF command.

flowcontrol *on|off*

Syntax Description

on	Enables a port to receive and process pause frames from remote ports or send pause frames to remote ports.
off	Prevents a port from receiving and processing pause frames from remote ports or from sending pause frames to remote ports.

Defaults

By default, Gigabit Ethernet and 10 Gigabit Ethernet interface ports are set to off.

Command Modes

Interface configuration

Usage Guidelines

Pause frames are special packets that signal a source to stop sending frames for a specific period of time because the buffers are full.

Examples

This example shows how to enable a port to pause frames:

```
MSTP-176(config-if)# flowcontrol receive on
MSTP-176(config-if)#
```

switchport mode trunk

To set a port as UNI/NNI, use the **switchport mode trunk** command.

switchport mode trunk

Defaults

By default, all client ports are dot1q-tunnel and all trunk ports are trunk.

Command Modes

Interface configuration

Usage Guidelines

The port has to be administratively down to make these settings

Examples

This example shows how to configure a port for trunk mode:

```
MSTP(config-if)# switchport mode trunk
```

To verify your settings enter the show interfaces privileged EXEC command.

switchport mode dot1q-tunnel

These commands set a port as UNI/NNI, use the **switchport mode trunk** command.

switchport mode dot1q-tunnel

Syntax Description

This command has no arguments or keywords.

Defaults

By default, all client ports are dot1q-tunnel and all trunk ports are trunk

Command Modes

Interface configuration

Usage Guidelines

Use the switchport mode trunk command to cause the interface to become a trunk.

Examples

This example shows how to configure a port as an IEEE 802.1Q tunnel port:

```
MSTP-176(config-if)# switchport mode dot1q-tunnel
```

To verify your settings enter the show interfaces privileged EXEC command.

service-policy input *name*

To set the ingress and egress QoS parameters on the port by mapping relevant policies to the port, use the **service-policy input** command.

service-policy input *name*

[no] service-policy input *name*

Syntax Description

name	Name of a service policy map to be attached.

Defaults

No policy maps are attached.

Command Modes

Interface configuration

Usage Guidelines

The port must be administratively down for configuring.

Examples

This example shows how to attach a policy map to an interface:

```
MSTP-176(config-if)# service-policy input pmap1
MSTP-176(config-if)#
```

service-policy output *name*

To set the ingress and egress QoS parameters on the port by mapping relevant policies to the port, use the **service-policy output *name*** command in interface configuration command.

service-policy output *name*

[no] service-policy output *name*

Syntax Description

name	Name of a service policy map to be attached.

Defaults

No policy map is attached.

Command Modes

Interface configuration

Examples

This example shows how to attach a policy map to an output interface:

```
MSTP-176(config-if)# service-policy output policy9
MSTP-176(config-if)#
```

service instance ethernet *name*

To create a service instance on an interface, use the **service instance ethernet *name*** command.

service instance ethernet *name*

Syntax Description

name	Name of a service instance. Maximum characters are 32

Command Modes

Interface configuration

Examples

This example shows how to create a service instance:

```
MSTP-176(config-if)# service instance Ethernet servether1
MSTP-176(config-if)#
```

l2protocol-tunnel

To enable protocol tunneling on an interface, use the **l2protocol-tunnel** command.

l2protocol-tunnel

Syntax Description

This command has no arguments or keywords.

Defaults

No Layer 2 protocol packets are tunneled.

Command Modes

Interface configuration

Examples

This example shows how to enable protocol tunneling:

```
MSTP-176(config-if)# l2protocol-tunnel
MSTP-176(config-if)#
```

[no] switchport port-security mac-address *mac-address*

To configure a secure MAC address for an interface, use the **switchport port-security mac-address** command.

switchport port-security mac-address *mac-address*

[no] switchport port-security mac-address *mac-address*

Syntax Description

mac-address	MAC address of the port. The format is 00:00:00:00:00:00

Defaults

MAC address is not secured on the port.

Command Modes

Interface configuration

Examples

This example shows how to configure a MAC address as secure on the interface:

```
MSTP-176(config-if)# switchport port-security mac-address ff:ee:00:12:30:04
```

ip igmp snooping mrouter

To configure a Layer 2 port as a multicast router port, use the ip igmp snooping mrouter command. Use the no form of this command to remove the configuration.

ip igmp snooping mroute

Command Modes

Interface configuration

Usage Guidelines

Takes effect on SVLANS associated with the port where IGMP is enabled.

Examples

This example shows how to specify the next-hop interface to the multicast router:

```
MSTP-176(config-if)# ip igmp snooping mrouter interface gigabitethernet 5
MSTP-176(config-if)#
```

encapsulation default

To set the encapsulation method used by the interface, use the **encapsulation default** command in service interface configuration mode.

encapsulation default

Syntax Description

This command has no arguments or keywords.

Command Modes

Service instance configuration

Usage Guidelines

Execute the rew ing tag push dot1 <svlan> command to set the port in transparent mode.

Examples

```
MSTP-176(config-if-srv)# encapsulation default
```

encapsulation dot1q *first cvlan last cvlan*

To enable IEEE 802.1Q encapsulation of traffic on a specified subinterface in a virtual LAN (VLAN), use the **encapsulation dot1q *first cvlan last cvlan>*** command in service interface configuration mode or subinterface configuration mode

encapsulation dot1q *first cvlan last cvlan>*

Syntax Description

<first cvlan> <last cvlan>	Comma must be entered to separate each customer VLAN (CVLAN) ID range from the next range.

This command has no arguments or keywords.

Defaults

By default, IEEE 802.1Q encapsulation is disabled.

Command Modes

Service instance configuration

Usage Guidelines

IEEE 802.1Q encapsulation is configurable on interface GiGe and 10Gige interfaces. IEEE 802.1Q is a standard protocol for interconnecting cards and for defining VLAN topologies.

Examples

```
MSTP-176(config-if-srv)# encapsulation dot1q 1000 1002
```

encapsulation untagged

Defines the matching criteria to be used in order to map untagged Ethernet frames ingress on an interface to the appropriate service instance.

encapsulation untagged

Syntax Description

This command has no arguments or keywords.

Command Modes

Service instance configuration

Examples

```
MSTP-176(config-if-srv)# encapsulation untagged
```

bridge-domain *svlan*

To enable RFC 1490 Frame Relay bridging to map a bridged VLAN to the GE_XP, 10GE_XP, GE_XPE, and 10GE_XPE card, use the **bridge-domain** command in service interface configuration mode.

bridge-domain *svlan*

Syntax Description

svlan	SVLAN ID to be used in the bridging configuration. The valid range is from 1 to 4093.

Defaults

Bridging is disabled.

Command Modes

Service instance configuration

Examples

The following example shows the GE_XP, 10GE_XP, GE_XPE, and 10GE_XPE being configured for IEEE 802.1Q VLAN bridging using a VLAN ID of 99:

```
MSTP-176(config-if-srv)# bridge-domain 99
```

police cir percent *%* bc *bytes* be *bytes*

To configure traffic policing based on a percentage of bandwidth available on an interface, use the police command in policy-map configuration mode.

police cir percent *%* **bc** *bytes* **be** *bytes*

Syntax Description

cir	Committed information rate. Indicates that the cir will be used for policing traffic.
percent	Specifies that percent of bandwidth will be used for calculating the cir.
%	Specifies the bandwidth percentage. Valid range is a number from 1 to 100.
bc	Conform burst (bc) size used by the first token bucket for policing traffic.
be	Peak burst (be) size used by the second token bucket for policing traffic.

Defaults

By default, traffic policing is disabled.

Command Modes

Policy-map configuration and VLAN profile configuration.

Examples

The following example configures traffic policing using a cir and a pir based on a percentage of bandwidth. In this example, a cir of 20 percent and a pir of 40 percent have been specified. Additionally, an optional bc value and be value (300 ms and 400 ms, respectively) have been specified.

```
MSTP(config-pmap)# police cir percent 20 bc 300 ms be 400 ms
```

set cos *number*

To set the Layer 2 class of service (CoS) value of an outgoing packet, use the set cos command in policy-map class configuration mode.

set cos *number*

Syntax Description

number	Specify the CoS value to be applied to the 802.1Q SVLAN tag. Values 0 through 7 specify constant values for the CoS. Values 8 and 9 mean: 8 = TRUST. This value indicates that the CVLAN CoS value must be trusted, i.e. copied into the SVLAN CoS field. 9 = CVLAN. This value indicates that the SVLAN CoS field is set based on the value of the CVLAN ID. This mapping is provided by an EVC service instance. A service instance on an interface can be defined to match frames with one or more CVLANs. That service instance can also have a policy applied that specifies a CoS. The result is a mapping from CVLAN to CoS on an interface.

Defaults

By default, no CoS value is set for the outgoing packet.

Command Modes

Policy-map configuration.

Usage Guidelines

Enter upto 9 CoS values.

Examples

In the following example, the policy map called "cos-set" is created to assign different CoS values for different types of traffic.

```
MSTP(config)# policy-map cos-set
MSTP(config-pmap-c)# set cos 1
```

wrr-queue cos-map *queue-id cos1 … cosn*

To map CoS values to drop thresholds for a queue, use the wrr-queue cos-map command.

wrr-queue cos-map *queue-id cos1 … cosn*

Syntax Description

queue-id	Queue number; the valid value is 1.
cos1 ... cosn	CoS value; valid values are from 0 to 9.

Command Modes

Policy-map configuration.

Examples

This example shows how to map the CoS values 0 and 1 to standard transmit queue 1

```
MSTP(config-pmap)# wrr-queue cos-map 1 1 0
MSTP(config-pmap)#
```

wrr-queue queue-id w*eight 1-16* bandwidth percent *%*

To allocate bandwidth between standard transmit queue 1 (low priority) and standard transmit queue 2 (high priority), use the **wrr-queue bandwidth** command.

wrr-queue <queue-id> weight <1-16> bandwidth percent <%>

Syntax Description

weight <1-16)	WRR weights; valid values are 1 to 15

Command Modes

Policy-map configuration.

Examples

This example shows how to allocate a three-to-one bandwidth ratio:

```
MSTP(config-pmap)# wrr-queue weight 2 bandwidth 3
```