QTECH
МИР ДОСТУПНЕЕ

РУКОВОДСТВО ПОЛЬЗОВАТЕЛЯ

STP Configuration Commands

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CHAPTER 1 STP CONFIGURATION COMMANDS

1.1. SSTP Configuration Commands

1.1.1. spanning-tree

Syntax

spanning-tree

no spanning-tree

To enable the default STP mode, run **spanning-tree**; to disable the STP, run **no spanning-tree**.

Enable or disable STP in interface configuration mode.

Parameter

None

Default value

Enable RSTP mode by default.

Usage guidelines

None

Command Mode

Global configuration mode

Physical port or aggression port configuration mode.

Example

None

1.1.2. spanning-tree mode sstp

Syntax

spanning-tree mode sstp

no spanning-tree mode

To switch between RSTP and SSTP modes, use the **spanning-tree mode** command. To return to the default settings, use the no form of this command.

Parameter

None

Default value

RSTP

Usage guidelines

None

Command Mode

Global configuration

Example

The following command shows how to enable SSTP mode:

Switch_config# spanning-tree mode sstp

Switch_config#

1.1.3. spanning-tree sstp priority

Syntax

To set the sstp bridge priority, use the spanning-tree sstp priority command. To return to the default settings, use the no form of this command.

spanning-tree sstp priority value

no spanning-tree sstp priority

Parameter

Parameter	Description
value	Value is from 0 to 61440.

Default value

32768

Usage Guidelines

When setting the priority value, you can make the node as the root of the spanning tree. The configuration value takes 4096 as a step and its value is the multiple of 4096. The configurable values are 0, 4096, 8192, 3*4096, 4*4096,…… and 15*4096.

Command mode

Global configuration

Example

This example shows how to set the SSTP priority to 4096:

Switch(config)# spanning-tree sstp priority 4096

Switch(config)#

1.1.4. spanning-tree sstp hello-time

Syntax

To set the hello-time delay timer, use the spanning-tree sstp hello-time command. To return to the default settings, use the no form of this command.

spanning-tree sstp hello-time time

no spanning-tree sstp hello-time

Parameter

Parameter	Description
time	Number of seconds to set the hello-time delay timer; valid values are from 1 to 10 seconds.

Default value

2s

Usage Guidelines

The hello-time configured by the local OLT is valid only when the local OLT is the root OLT.

Command mode

Global configuration

Example

The following example sets the SSTP hello-time to 8 seconds:

Switch(config)# spanning-tree sstp hello-time 8

Switch(config)#

1.1.5. spanning-tree sstp max-age

Syntax

To set the SSTP max-age timer, use the spanning-tree sstp max-age command. To return to the default settings, use the no form of this command.

spanning-tree sstp max-age *time*

no spanning-tree sstp max-age

Parameter

Parameter	Description
seconds	Number of seconds to set the max-age timer; valid values are from 6 to 40 seconds.

Default value

20s

Usage Guidelines

None

Command mode

Global configuration

Example

This example shows how to set the max-age timer to 24 seconds:

Switch(config)# spanning-tree sstp max-age 24

Switch(config)#

1.1.6. spanning-tree sstp forward-time

Syntax

To set the forward-delay timer, use the spanning-tree sstp forward-time command in global configuration mode. To return to the default settings, use the no form of this command.

spanning-tree sstp forward-time *time*

no spanning-tree sstp forward-time

Parameter

Parameter	Description
time	Number of seconds to set the forward-delay timer; valid values are from 4 to 30 seconds.

Default value

15 seconds

Usage Guidelines

None

Command mode

Global configuration

Example

The following example shows how to set forward delay timer to 20 seconds:

Switch_config# spanning-tree sstp forward-time 20

Switch_config#

1.1.7. spanning-tree sstp cost

Syntax

To set the path cost of the interface for SSTP calculations, use the spanning-tree sstp cost command in interface configuration mode. To return to the default value, use the no form of this command.

spanning-tree sstp cost *value*

no spanning-tree sstp cost

Parameter

Parameter	Description
value	Path cost. Valid values are from 1 to 200000000

Default value

10M Ethernet:100.

100M Ethernet: 19.

1000M Ethernet: 4.

Usage Guidelines

None

Command mode

Interface configuration

Example

This example shows how to set a path cost value of 100 for the spanning tree VLAN associated with the interface G0/1:

Switch_config_g0/1#spanning-tree sstp cost 100

Switch_config_g0/1#

1.1.8. spanning-tree cost

Syntax

To set the path cost of the interface for Spanning Tree Protocol (STP) calculations, use the spanning-tree cost command in interface configuration mode. To return to the default value, use the no form of this command.

spanning-tree cost *value*

no spanning-tree cost

Parameter

Parameter	Description
value	Path cost; valid values are from 1 to 200000000

Default value

The default path cost is computed from the bandwidth setting of the interface.

Usage Guidelines

The configuration result of this command is valid to all spanning-tree modes. In STP mode, the path cost of all VLAN spanning-trees on the interface will be updated. In MSTP mode, the path cost of all spanning-tree examples will be updated.

But the configuration result of the command will not influence the independent configuration in various modes. For example, the OLT respectively configured with the spanning-tree sstp cost 100 and the spanning-tree cost 110 in SSTP mode, the port priority will be 100.

Command mode

Interface configuration

Example

This example shows how to set a path cost value of 24 for the spanning tree VLAN associated with the interface g0/1:

Switch(config_f0/0)# spanning-tree cost 24

Switch_config_g0/1#

1.1.9. spanning-tree sstp port-priority

Syntax

To set the priority value in SSTP mode, use the spanning-tree sstp port-priority command. Use the no form of this command to restore the default value.

spanning-tree sstp port-priority *value*

no spanning-tree sstp port-priority

Parameter

Parameter	Description
value	Port priority. Value is from 0 to 240.

Default value

128 (0x80)

Usage Guidelines

The port priority must be set in increments of 16 only.

Command mode

Interface configuration

Example

The following example sets 32 as the priority value on interface g0/1:

Switch_config_g0/1# spanning-tree sstp port-priority 32

Switch_config_g0/1#

1.1.10. spanning-tree port-priority

Syntax

To prioritize an interface when two bridges compete for position as the root bridge, use the spanning-tree port-priority command. The priority you set breaks the tie. To return to the default value, use the no form of this command.

spanning-tree port-priority *value*

no spanning-tree port-priority

Parameter

Parameter	Description
value	Port priority. Value is from 0 to 240. Step: 16

Default value

Port priority value is 128

Usage Guidelines

The configuration result of this command is valid to all spanning-tree modes. In STP mode, the priority of all VLAN spanning-trees on the interface will be updated. In MSTP mode, the priority of all spanning-tree examples will be updated.

But the configuration result of the command will not influence the independent configuration in various modes. For example, the OLT respectively configured with the spanning-tree sstp port-priority 128 and the spanning-tree port-priority 48 in SSTP mode, the port priority will be 128.

Command mode

Interface configuration

Example

The following example shows how to set the priority value to g0/1:

Switch_config_g0/1#spanning-tree port-priority 16

Switch_config_g0/1#

1.1.11. show spanning-tree

Syntax

To display spanning-tree information for the specified spanning-tree instances, use the show spanning-tree command.

show spanning-tree [detail | interface *intf-i* **| mstp| pvst | interfacevlan]**

Parameter

Parameter	Description
intf-i	Interface name, for instance, G5/1.

Default value

None

Usage Guidelines

Show spanning-tree state.

Command mode

EXEC/Global configuration/Interface configuration

Example

```
Switch_config#show spanning-tree
Spanning tree enabled protocol SSTP
SSTP
  Root ID    Priority    32768
             Address     00E0.0FCC.F775
             This bridge is the root
             Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec
  Bridge ID  Priority    32768
             Address     00E0.0FCC.F775
             Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec
Interface        Role Sts Cost      Pri.Nbr Type
---------------- ---- --- --------- ------- --------------------------------
G5/1             Desg FWD 19        128.16  P2p
Switch_config#
```

1.1.12. spanning-tree management trap

Syntax

To enable STP Trap, run command **spanning-tree management trap [newroot | topologychange]**. To return to the default value, use the no form of this command.

[no] spanning-tree management trap [newroot | topologychange]

Parameter

Parameter	Description

newroot	newRoot Trap type
topologychange	topologyChange Trap type

Default value

STP Trap is not enabled.

Usage guidelines

None

Command mode

global configuration configuration mode

Example

None

1.2. VLAN STP Configuration Commands

1.2.1. spanning-tree mode pvst

Syntax

spanning-tree mode pvst

no spanning-tree mode

To enable VLAN-based STP mode, run spanning-tree mode pvst. To disable the function, use the no form of the command.

Parameter

None

Default value

RSTP mode

Usage Guidelines

None

Example

The following example shows how to enable pvst on OLT.

Switch_config# spanning-tree mode pvst

Switch_config#

1.2.2. spanning-tree vlan

Syntax

spanning-tree vlan *vlan-list*

no spanning-tree vlan *vlan-list*

To designate VLAN to distribute the STP case, run spanning-tree vlan vlan-list. To cancel the spanning tree of the designated VLAN, run no spanning-tree vlan vlan-list.

Parameter

Parameter	Description
vlan-list	VLAN number list, for instance, 1,2,3-10,15.

Default value

OLT only distributes SFP instances for a certain number of VLANs. The outnumbered VLANs will be automatically added to the STP forbidden list.

Usage Guidelines

None

Command mode

Global configuration

Example

The following example shows how to delete the STP of VLAN10, 11, 15-19 and distribute STP for VLAN 40-50.

Switch_config#no spanning-tree vlan 10,11,15-19

Switch_config#spanning-tree vlan 40-50

Switch_config#

1.2.3. spanning-tree vlan priority

Syntax

spanning-tree vlan *vlan-list* **priority** *value*

no spanning-tree vlan *vlan-list* **priority**

To designate the priority level of the bridge of the VLAN STP, run **spanning-tree vlan vlan-list priority value**.

Parameter

Parameter	Description
vlan-list	VLAN number list, for instance, 1,2,3-10,15.
value	Priority value, range 0 – 61440, step: 4096

Default value

By default, the priority level of the bridge of each VLAN spanning tree is 32768 plus the VLAN number.

Usage Guidelines

None

Command mode

Global configuration

Example

The following example shows how to configure the bridge priority of VLAN1-3 and 5-10 be 4096:

Switch_config#spanning-tree vlan 1-3,5-10 priority 4096

Switch_config#

1.2.4. spanning-tree vlan forward-time

Syntax

spanning-tree vlan *vlan-list* **forward-time** *value*

no spanning-tree vlan *vlan-list* **forward-time**

The command is used to designate Forward Delay Parameter of SFP in VLAN. To disable this function, use the no form of this command.

Parameter

Parameter	Description
vlan-list	VLAN number list, for instance, 1,2,3-10,15.
value	Forward-Delay value; value ranges from 4s to 30s; the default is 15s.

Default value

The Forward Delay of all VLANs is 15s.

Usage Guidelines

None

Command mode

Global Configuration

Example

The following example shows how to configure the Forward Delay of VLAN1-3,5-10 to be 19s:

Switch_config#spanning-tree vlan 1-3,5-10 forward-time 19

Switch_config#

1.2.5. spanning-tree vlan max-age

Syntax

spanning-tree vlan *vlan-list* **max-age** *value*

no spanning-tree vlan *vlan-list* **max-age**

The command is used to designate Max AgeParameter of STP in VLAN. To disable this function, use the no form of this command.

Parameter

Parameter	Description
vlan-list	VLAN number list, for instance, 1,2,3-10,15.
value	max-age value; the value range is 6s to 40s; the default is 20s.

Default

Max Age of all VLANs is 20s.

Usage Guidelines

None

Command mode

Global Configuration

Example

The following example shows how to configure Max Age of VLAN1-3,5-10 as 19s:

Switch_config#spanning-tree vlan 1-3,5-10 max-age 19

Switch_config#

1.2.6. spanning-tree vlan hello-time

Syntax

spanning-tree vlan *vlan-list* **hello-time** *value*

no spanning-tree vlan *vlan-list* **hello-time**

The command is used to configure hello-time Parameter of STP in VLAN. To return to the defaut setting, use the no form of this command.

Parameter

Parameter	Description

vlan-list	VLAN number list, for instance, 1,2,3-10,15.
value	hello-time value, the value ranges from 1s to 10s, the default is 2s.

Default value

Hello-Time of all VLANs is 2s.

Usage Guidelines

None

Command mode

Global Configuration

Example

The following example shows how to set Hello Time of VLAN1-3,5-10 to 9s:

Switch_config#spanning-tree vlan 1-3,5-10 hello-time 9

Switch_config#

1.2.7. spanning-tree vlan cost

Syntax

spanning-tree vlan *vlan-list* **cost** *value*

no spanning-tree vlan *vlan-list* **cost**

To set the path cost of the spanning tree in the designated VLAN, run spanning-tree vlan vlan-list cost value. To resume the default value, run no spanning-tree vlan vlan-list cost.

Parameter

Parameter	Description
vlan-list	VLAN number list, for instance, 1,2,3-10,15.
value	The port path cost. The value ranges: 1 – 200000000

Default value

The path cost of a port depends on the port rate.

The value of the path cost of the 10M Ethernet is 100.

The value of the path cost of the 100M Ethernet is 19.

The value of the path cost of the 1000M Ethernet is 4.

Usage Guidelines

None

Command mode

Interface configuration

Example

The following example shows how to set the path cost of port G0/1 VLAN1-3,5-10 to 100:

Switch_config_g0/1#spanning-tree vlan 1-3,5-10 cost 100

Switch_config_g0/1#

1.2.8. spanning-tree vlan port-priority

Syntax

spanning-tree vlan *vlan-list* **port-priority** *value*

no spanning-tree vlan *vlan-list* **port-priority**

To set the priority level of the spanning tree in the designated VLAN, run **spanning-tree vlan vlan-list port-priority value**. To resume the default value, run **no spanning-tree vlan vlan-list port-priority**.

Parameter

Parameter	Description
vlan-list	VLAN number list, for instance, 1,2,3-10,15.
value	Port priority, value ranges 0 – 240, step 16.

Default value

128

Usage Guidelines

None

Command mode

Interface configuration

Example

The following example shows how to set the priority level of port g0/1 VLAN1-3,5-10 to 32.

Switch_config_g0/1#spanning-tree vlan 1-3,5-10 port-priority 32

Switch_config_g0/1#

1.2.9. show spanning-tree vlan

Syntax

show spanning-tree vlan vlan-list [detail]

To check the state of the spanning tree in the designated VLAN, run the above command.

Parameter

Parameter	Description
vlan-list	VLAN number list, for instance, 1,2,3-10,15.
detail	Show detailed information.

Default value

None

Usage Guidelines

None

Command mode

EXEC, Global Configuration or Interface configuration

Example

The following example shows how to check the spanning tree in VLAN1-2:

```
Switch_config#show spanning-tree vlan 1-2
Spanning tree enabled protocol PVST
VLAN0001
  Root ID    Priority    32769
             Address     00E0.0FCC.F775
             This bridge is the root
             Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec
  Bridge ID  Priority    32769
             Address     00E0.0FCC.F775
             Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec
Interface        Role Sts Cost      Pri.Nbr Type
---------------- ---- --- --------- ------- --------------------------------
G0/1             Desg FWD 19        128.1  P2p
VLAN0002
```

```
Root ID    Priority    32770
           Address     00E0.0FCC.F775
           This bridge is the root
           Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec
Bridge ID  Priority    32770
           Address     00E0.0FCC.F775
           Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec
Interface        Role Sts Cost      Pri.Nbr Type
---------------- ---- --- --------- ------- --------------------------------
G0/1             Desg FWD 19        128.1  P2p
Switch_config#
```

1.2.10. show spanning-tree pvst instance-list

Syntax

show spanning-tree pvst instance-list

The command is used to check the corresponding relationship between PVST instance and VLAN.

Parameter

None

Default value

None

Usage Guidelines

None

Command mode

EXEC, Global Configuration or Interface configuration

Example

None

CHAPTER 2 RSTP CONFIGURATION COMMANDS

2.1. RSTP Configuration Commands

2.1.1. spanning-tree mode rstp

Syntax

spanning-tree mode rstp

no spanning-tree mode

To enable the RSTP function, run spanning-tree mode rstp. To disable the RSTP, run no spanning-tree mode.

Parameter

None

Default value

RSTP is enabled.

Usage Guidelines

None

Example

The following command shows how to enable rstp on OLT.

Switch_config# spanning-tree mode rstp

Switch_config#

2.1.2. spanning-tree rstp forward-time

Syntax

spanning-tree rstp forward-time time

no spanning-tree rstp forward-time

To configure the forwarding delay of RSTP, run spanning-tree rstp forward-time time. To resume the default forwarding delay of RSTP, run no spanning-tree rstp forward-time.

Parameter

Parameter	Description
time	Time of the forwarding delay whose value ranges between 4 and 30 seconds.

Default value

15s

Usage Guidelines

None

Example

The following example shows how to set the forwarding delay of RSTP to 20 seconds.

Switch_config# spanning-tree rstp forward-time 20

Switch_config#

2.1.3. spanning-tree rstp hello-time

Syntax

spanning-tree rstp hello-time *time*

no spanning-tree rstp hello-time

To configure the update interval of RSTP, run **spanning-tree rstp hello-time *time***. To resume the default update interval of RSTP, run **no spanning-tree rstp hello-time**.

Parameter

Parameter	Description
time	Update interval. The value ranges: 1-10s.

Default value

2s

Usage Guidelines

The Hello-Time configured on the local OLT validates only when the local OLT runs as a root OLT.

Example

The following example shows how to set the update interval of RSTP to 8 seconds.

Switch_config# spanning-tree rstp hello-time 8

Switch_config#

2.1.4. spanning-tree rstp max-age

Syntax

spanning-tree rstp max-age *time*

no spanning-tree rstp max-age

To configure the maximum lifespan of the RSTP BPDU, run **spanning-tree rstp max-age time**. To resume the default interval time, run **no spanning-tree rstp max-age**.

Parameter

Parameter	Description
time	Maximum interval of the lifespan. Value ranges: 6-40s.

Default value

20s

Usage Guidelines

None

Example

The following example shows how to set the maximum lifespan of RSTP to 24 seconds.

Switch_config# spanning-tree rstp max-age 24

Switch_config#

2.1.5. spanning-tree rstp priority

Syntax

spanning-tree rstp priority *value*

no spanning-tree rstp priority

To configure the RSTP priority value, run **spanning-tree rstp priority** *value*. To resume the default value of the RSTP priority value, run **no spanning-tree rstp priority**.

Parameter

Parameter	Description
value	Priority level of the bridge. The value ranges: 0-61440, step 4096.

Default value

32768

Usage Guidelines

None

Example

The following example shows how to configure the priority level of the brigde of rstp to 4096.

Switch_config# spanning-tree rstp priority 4096

Switch_config#

2.1.6. spanning-tree rstp cost

Syntax

To configure the path cost of a port, run **spanning-tree rstp cost *value***. To resume the default value, run **no spanning-tree rstp cost**.

spanning-tree rstp cost *value*

no spanning-tree rstp cost

Parameter

Parameter	Description
value	Value of the path cost. The value ranges: 1-200000000.

Default value

The path cost depends on the connection rate of the port.

10 Mbps: 2000000

100 Mbps: 200000

1000 Mbps: 20000

Usage Guidelines

None

Example

The following example shows how to set the path cost of port g0/1 to 24:

Switch_config_g0/1# spanning-tree rstp cost 24

Switch_config_g0/1#

2.1.7. spanning-tree rstp port-priority

Syntax

To configure the priority level of a port, run **spanning-tree rstp port-priority *value***. To resume the default value, run **no spanning-tree rstp port-priority**.

spanning-tree rstp port-priority *value*

no spanning-tree rstp port-priority

Parameter

Parameter	Description
value	Priority level of a port. The value ranges: 0-240, step 16.

Default value

128

Usage Guidelines

None

Example

The following example shows how to set the path cost of port g0/1 to 16:

Switch_config_g0/1# spanning-tree rstp port-priority 16

Switch_config_g0/1#

2.1.8. spanning-tree rstp edge

Syntax

To configure the edge port, run **spanning-tree rstp edge**. To return to the default setting, run **no spanning-tree rstp edge**.

spanning-tree rstp edge

no spanning-tree rstp edge

Parameter

None

Default value

Automatic check

Usage Guidelines

None

Command Mode

Interface configuration

Example

None

2.1.9. spanning-tree rstp point-to-point

Syntax

To set the point-to-point connection of a port to force-truce, force-false or auto, run this command.

spanning-tree rstp point-to-point [force-true | force-false | auto]

Parameter

Parameter	Description
force-true	To set the point-to-point connection of a port to force-truce.

force-false	To set the point-to-point connection of a port to force-false.
auto	Sets the point-to-point connection to be automatic check (default).

Default value

Automatic check

Usage Guidelines

None

Command Mode

Interface Configuration

Example

None

2.1.10. spanning-tree rstp migration-check

Syntax

To restart checking protocol transfer of RSTP, run **spanning-tree rstp migration-check**.

spanning-tree rstp migration-check

Parameter

None

Default value

None

Usage Guidelines

This command is used to restart the protocol transfer check on a port and to change the port in STP-compatible mode to the RSTP mode, enabling RSTP BPDU to be transmitted.

Command Mode

Global and interface configuration

Example

The following example shows how to run protocol transfer check on interface G0/1:

Switch_config_g0/1#spanning-tree rstp migration-check

Switch_config_g0/1#

CHAPTER 3 MSTP CONFIGURATION COMMANDS

3.1. MSTP Configuration Command

3.1.1. spanning-tree mode mstp

Syntax

To set the running mode of STP to MSTP, run **spanning-tree mode mstp**. To disable STP, run **no spanning-tree mode**.

spanning-tree mode mstp

no spanning-tree mode

Parameter

None

Default value

The MSTP mode is disabled, while the RSTP mode is running.

Usage Guidelines

None

Example

The following example shows how to enable MSTP protocol on the OLT:

switch(config)# spanning-tree mode mstp

switch(config)#

3.1.2. spanning-tree mstp name

Syntax

spanning-tree mstp name *string*

no spanning-tree mstp name

To configure the regional name of the STP, run spanning-tree mstp name string. To resume the default name, run no spanning-tree mstp.

Parameter

Parameter	Description
String	Configures the character string of the name. The character string can have up to 32 characters, capital sensitive. The default value is in the form of character string like the MAC address of the OLT.

Default value

Character string form of the OLT's MAC address

Usage Guidelines

None

Example

The following example shows how to set the configuration name of the OLT's STP to reg-01.

```
switch(config)# spanning-tree mstp name reg-01
switch(config)#
```

3.1.3. spanning-tree mstp revision

Syntax

To generate the revision number of STP, run **spanning-tree mstp revision *value***. To return to the default value, run **no spanning-tree mstp revision**.

spanning-tree mstp revision *value*

no spanning-tree mstp revision

Parameter

Parameter	Description
Value	Revision number: 0 ~65535 Its default value is 0.

Default value

The default value of the revision number is 0.

Usage Guidelines

None

Example

The following commands are used to set the regional revision number of STP to 100.

```
switch(config)# spanning-tree mstp revision 100
switch(config)#
```

3.1.4. spanning-tree mstp instance

Syntax

To map the VLAN to the MSTI, run **spanning-tree mstp instance** *instance-id* **vlan** *vlan-list*. To re-map the VLAN to the CIST, run **no spanning-tree mstp instance** *instance-id*.

spanning-tree mstp instance *instance-id* **vlan** *vlan-list*

no spanning-tree mstp instance *instance-id*

Parameter

Parameter	Description
instance-id	Instance number of the STP, meaning an MSTI which ranges from 1 to 31.
vlan-list	VLAN list which is mapped to the STP, ranging from 1 to 4094.

Default value

All VLANs are mapped to the CIST (MST00).

Usage Guidelines

instance-id is an unique value representing an STP instance.

vlan-list represents a VLAN group, such as “1,2,3”, “1-5” and “1,2,5-10”.

Example

The following commands map VLAN1 to instance 1 of STP, and VLAN5,7,10-20 to instance 2 of STP, and then re-map these VLANs to MST00.

Switch_config# spanning-tree mstp instance 1 vlan 2

Switch_config# spanning-tree mstp instance 2 vlan 5,7,10-20

Switch_config# no spanning-tree mstp instance 1

Switch_config# no spanning-tree mstp instance 2

3.1.5. spanning-tree mstp root

Syntax

Configure the specified MSTP instance to the primary/secondary root. Run its negative form to restore the priority of MSTP instance to the default value.

To configure the specified MSTP instance to the primary/secondary root, run **spanning-tree mstp** *instance-id* **root {primary | secondary}**. To return to the default setting, run the negative form of the above command.

spanning-tree mstp *instance-id* **root {primary | secondary}**

[diameter *net-diameter* **[hello-time** *seconds* **]]**

no spanning-tree mstp *instance-id* root

Both the diameter command and the hello-time command can modify the network diameter and the HelloTime parameter of the MSTP when they are setting the root.

Parameter

Parameter	Description
instance-id	MSTP instance, ranging from 0 to 31.
primary	Sets the MSTP instance to the primary root.
secondary	Sets the MSTP instance to the secondary root.
net-diameter	Network diameter, which is optional When the instance-id parameter is 0, it is effective. It ranges from 2 to 7.
seconds	Hello time, an optional parameter, which ranges from 1 to 10 seconds.

Default value

The priority value of all default roots of all MSTP instances are 32768, the network diameter is 7 and the HelloTime is 2 seconds.

Usage Guidelines

Both the diameter command and the hello-time command are valid only when instanc-id is 0.

Generally, after you run the command to set the primary root, the protocol automatically checks the ID of the current network root and then sets the priority field of the root identifier to 24576 if this value gurantees the current OLT to be the root of the MSTP instance. If the priority value of the root is smaller than 24576, the protocol will automatically set the MSTP priority of the current root to a value which is 4096 smaller than the root's priority. Here, 4069 is the step of the root priority.

Different from the configuration of the primary root, the protocol directly sets the MSTP priority of the OLT to **28672** after the command for configuring the secondary root is run. Thus, the current OLT can be the secondary root when the priorities of other OLTs are the default value **32768**.

Example

The following commands are used to set the OLT to the primary root in the CIST and recalculate the time parameter of the MSTP through network diameter 3 and HelloTime3, and at last set the OLT to the secondary root in the MST01.

Switch_config# spanning-tree mstp 0 root primary diameter 3 hello-time 3

Switch_config# spanning-tree mstp 1 root secondary

3.1.6. spanning-tree mstp priority

Syntax

To configure the bridge priority of the MSTP instance, run **spanning-tree mstp** *instance-id* **priority** *value*. To return to the default setting, run **no spanning-tree mstp** *instance-id* **priority**.

spanning-tree mstp *instance-id* **priority** *value*

no spanning-tree mstp *instance-id* **priority**

Parameter

Parameter	Description
instance-id	MSTP instance number, ranging from 0 to 31.
value	Bridge priority, which can be one of the given values: 0, 4096, 8192, 12288, 16384, 20480, 24576, 28672, 32768, 36864, 40960, 45056, 49152, 53248, 57344, 61440.

Default value

The default priority of the bridges of all MSTP instances is 32768.

Usage Guidelines

Each priority value in the MSTP instance is independent and can be configured independently.

Example

The following commands are used to set the priority of the OLT in the CIST and MST01 to 4096 and 8192 respectively.

Switch_config# spanning-tree mstp 0 priority 4096

Switch_config# spanning-tree mstp 1 priority 8192

3.1.7. spanning-tree mstp hello-time

Syntax

spanning-tree mstp hello-time *seconds*

no spanning-tree mstp hello-time

It is used to configure the hello-time of the MSTP, and its negative form is used to resume the default settings of the HelloTime.

Parameter

Parameter	Description
seconds	It ranges from 1 to 10 seconds. Its default value is 2 seconds.

Default value

2 seconds

Usage Guidelines

None

Example

The following commands are used to set the HelloTime of the MSTP to 10.

switch(config)# spanning-tree mstp hello-time 10

switch(config)# no spanning-tree mstp hello-time

3.1.8. spanning-tree mstp forward-time

Syntax

spanning-tree mstp forward-time *seconds*

no spanning-tree mstp forward-time

It is used to configure the Forward Delay of the MTSP. Its negative is used to resume the default settings.

Parameter

Parameter	Description
seconds	It ranges from 4 to 30 seconds. Its default value is 15 seconds.

Default value

15 seconds

Usage Guidelines

None

Example

The following commands are used to set the Forward Delay parameter of the MTSP to 10.

Switch_config# spanning-tree mstp forward-time 10

Switch_config# no spanning-tree mstp forward-time

3.1.9. spanning-tree mstp max-age

Syntax

To configure the Max Age parameter of the MSTP, run **spanning-tree mstp max-age** *seconds*. To return to the default setting, run the negative form of the command.

spanning-tree mstp max-age *seconds*

no spanning-tree mstp max-age

Parameter

Parameter	Description
seconds	Range: 6 – 40 seconds. The default value is 20 seconds.

Default value

20 seconds

Usage Guidelines

None

Example

The following commands are used to set the MaxAge parameter of the MSTP to 10.

Switch_config# spanning-tree mstp max-age 10

Switch_config# no spanning-tree mstp max-age

3.1.10. spanning-tree mstp diameter

Syntax

To configure the network diameter of the MSTP, run **spanning-tree mstp diameter** *net-diameter*. To return to the default setting, run **no spanning-tree mstp diameter**.

spanning-tree mstp diameter *net-diameter*

no spanning-tree mstp diameter

Parameter

Parameter	Description
net-diameter	Range: 2 – 7. Its default value is 7.

Default value

The default network diameter is 7.

Usage Guidelines

The net-diameter parameter is not saved as an independent settings in the OLT. The time parameter that is modified through network diameter configuration can be saved. The net-diameter parameter is valid in the CIST. After settings, the three time parameters of the STP can be automatically updated to a relatively advantageous value.

It is recommended to set the time parameters of the STP through root configuration or network diameter configuration. In this way, the reasonability of the time parameters can be assured.

Example

The following first command is to set the bridge diameter of MSTP to 5. The second command is to resume the default value of the bridge diameter.

Switch_config# spanning-tree mstp diameter 5

Switch_config# no spanning-tree mstp diameter

3.1.11. spanning-tree mstp max-hops

Syntax

spanning-tree mstp max-hops *hop-count*

no spanning-tree mstp max-hops

The **spanning-tree mstp max-hops *hop-count*** command is used to set the maximum number of hops of the MSTP BPDU. Its negative is used to resume the default settings.

Parameter

Parameter	Description
hop-count	Ranges from: 6-40. Its default value is 20.

Default value

The default vaue of the maximum hop counts is 20.

Usage guidelines

None

Example

The first command is to set the maximum hop counts of the MSTP BPDU to 6. The second command is to restore the default value of the maximum hop counts.

Switch_config# spanning-tree mstp max-hops 6

Switch_config# no spanning-tree mstp max-hops

3.1.12. spanning-tree mstp port-priority

Syntax

To designate the priority of the spanning-tree STP instance, run **spanning-tree mstp** *instance-id* **port-priority** *value*. To return to the default setting, run the no form of the command.

spanning-tree mstp *instance-id* **port-priority** *value*

no spanning-tree instance-id port-priority

Parameter

Parameter	Description
instance-id	Number of the STP instance, ranging from 0 to 31.
Value	Port priority, which is one of the following values: 0, 16, 32, 48, 64, 80, 96, 112 128, 144, 160, 176, 192, 208, 224, 240

Default value

The default priority value of the port in all STP instances is 128.

Usage Guidelines

None

Example

The first command is to set the priority of port G0/1 in the CIST to 16. The second command is to resume the default value.

Switch_config_g0/1# spanning-tree mstp 0 port-priority 16

Switch_config_g0/1# no spanning-tree mstp 0 port-priority

3.1.13. spanning-tree mstp cost

Syntax

The command **spanning-tree mstp** *instance-id* **cost** *value* is used to set the path cost of the port in the specified STP instance. Its negative is used to resume the default settings.

spanning-tree mstp *instance-id* **cost** *value*

no spanning-tree mstp *instance-id* **cost**

Parameter

Parameter	Description
instance-id	Number of the STP instance, ranging from 0 to 31.
Value	Path cost of the port, ranging from 1 to 200000000.

Default value

It depends on the connection rate of the port:

10 Mbps: 2000000

100 Mbps: 200000

1000 Mbps: 20000

Usage Guidelines

None

Example

The following commands are used to set the path cost of port G0/1 in the CIST to 200.

Switch_config_g0/1# spanning-tree mstp 0 cost 200

Switch_config_g5/1#

3.1.14. spanning-tree mstp edge

Syntax

spanning-tree mstp edge

no spanning-tree mstp edge

To configure the edge port, run **spanning-tree mstp edge**. To return to the default setting, run **no spanning-tree mstp edge**.

Parameter

None

Default value

Automatic check edge port

Usage Guidelines

None

Example

None

3.1.15. spanning-tree mstp point-to-point

Syntax

spanning-tree mstp point-to-point { force-true | force-false | auto }

no spanning-tree mstp point-to-point

To configure the connection type of a port, run **spanning-tree mstp point-to-point { force-true | force-false | auto }**. To resume the connection type to auto-check, run **no spanning-tree mstp point-to-point**.

Parameter

Parameter	Description
force-true	Sets the port connection mode to point-to-point.
force-false	Sets the port connection mode to sharing.
auto	Sets the port connection mode to auto-chech (the default mode).

Default value

MSTP will automatically check the port connection mode by default.

Usage Guidelines

None

Example

The following example shows how to set the connection mode of port G0/1 to sharing.

Switch_config_g0/1# spanning-tree mstp point-to-point force-false

Switch_config_g0/1#

3.1.16. spanning-tree mstp mst-compatible

Syntax

spanning-tree mstp mst-compatible

no spanning-tree mstp mst-compatible

Enable/disable the MST-compatible mode, the global configuration mode.

spanning-tree mstp mst-compatible {enable | disable}

no spanning-tree mstp mst-compatible

Enable/disable the MST-compatible mode, the interface configuration mode.

Parameter

Parameter	Description
enable	Enable the MST-compatible mode.
disable	Disable the MST-compatible mode.

Default value

The compitable mode is not activated by default and OLT cannot establish an area with other switches which transmit BPDU in compatible mode.

Usage Guidelines

After the MST-compatible mode is enabled, configure other connected switches that are running other MSTP protocols to the roots of CIST, ensuring that the OLT can enter the MSTP-compatible mode by receiving the message.

Example

The following command is to activate the MST-compatible mode in global configuration mode:

switch(config)#spanning-tree mstp mst-compatible

3.1.17. spanning-tree mstp migration-check

Syntax

spanning-tree mstp migration-check

Clear the STP information that is checked by the port, and restart the protocol conversion process.

Parameter

None

Default value

None

Usage Guidelines

The command is valid in global configuration mode and in port configuration mode.

Example

The following commands are used to check the protocol conversion on all ports first, and then check the protocol conversion on port G5/1 again.

Switch_config# spanning-tree mstp migration-check

Switch_config# interface g0/1

Switch_config_g0/1# spanning-tree mstp migration-check

3.1.18. spanning-tree mstp restricted-role

Syntax

[no] spanning-tree mstp restricted-role

Enable/disable the role restriction on the port.

Parameter

None

Default value

Disable the port’s role restriction.

Command Mode

Interface Configuration

Usage Guidelines

Enable the role restriction and the port will not be chosen as the root port.

Example

None

3.1.19. spanning-tree mstp restricted-tcn

Syntax

[no] spanning-tree mstp restricted-tcn

Enable/disable the TCN restriction on the port.

Parameter

None

Default value

Disable the TCN restriction on the port.

Command Mode

Interface Configuration

Usage Guidelines

Enable the TCN restriction on the port and do not tranmit topology changes to other ports.

Example

None

3.1.20. show spanning-tree mstp

Syntax

show spanning-tree mstp [instance *instance-id* **]**

The command above is used to check the MSTP information. If you run the command **show spanning-tree mstp**, the information about all STP instances is displayed.

Parameter

Parameter	Description
instance-id	Number of the STP instance, ranging from 0 to 15.

Default

None

Usage Guidelines

It is valid in monitoring mode, global configuration mode or port mode.

Example

The following shows how to view all STP instances through the command. Here, MST00 stands for CIST, and the Type field stands for the port connection type.

```
Switch#show spanning-tree mstp
MST00       Vlans Mapped:  1,4-4094
Root      Address  00E0.0F64.8365  Priority  32768 (32768 mst-id 0)
Root        This root is the CIST and regional root
Configured  Hello Time 2, Forward Delay 15, Max Age 20, Max Hops 20
Root Times  Hello Time 2, Forward Delay 15, Max Age 20
Interface        Role Sts Cost      Pri.Nbr Type
---------------- ---- --- --------- ------- --------------------------------
F0/1             Desg FWD 200000    128.1   P2p
F0/3             Back BLK 200000    128.3   P2p
F0/47            Desg FWD 200000    128.47  Edge
MST01       Vlans Mapped:  2
Root      Address  00E0.0F64.8365  Priority  32769 (32768 mst-id 1)
Root        This root for MST01
Interface        Role Sts Cost      Pri.Nbr Type
---------------- ---- --- --------- ------- --------------------------------
F0/1             Desg FWD 200000    128.1   P2p
MST02       Vlans Mapped:  3
Root      Address  00E0.0F64.8365  Priority  32770 (32768 mst-id 2)
Root        This root for MST02
Interface        Role Sts Cost      Pri.Nbr Type
---------------- ---- --- --------- ------- --------------------------------
F0/1             Desg FWD 200000    128.1   P2p
```

3.1.21. show spanning-tree mstp region

Syntax

show spanning-tree mstp region

Check the regional configuration information about the MSTP.

Parameter

None

Default value

None

Usage Guidelines

None

Example

See the following information. MST Config Table shows the relation between VLAN and STP instance.

switch(config)# show spanning-tree mstp region

MST Region:

Name: [reg01]

Revision:[0]

MST Config Table:

Instance	VLAN IDs
0	1,4-4094
1	2
2	3

3.1.22. show spanning-tree mstp detail

Syntax

show spanning-tree mstp detail

The command above is used to check the detailed information about MSTP.

Parameter

None

Default value

None

Usage Guidelines

None

Example

The following example shows the detailed STP information after the command is run, including the port connection type and optional characteristics:

Switch#show spanning-tree mstp detail

MST00 Vlans Mapped: 1,4-4094

```
Root      Address  00E0.0F64.8365  Priority  32768 (32768 mst-id 0)
Root       This root is the CIST and regional root
Configured  Hello Time 2, Forward Delay 15, Max Age 20, Max Hops 20
Root Times  Hello Time 2, Forward Delay 15, Max Age 20
FastEthernet0/1 of MST00 is designated forwarding
Port Info            Port ID 128.1          Priority 128    Cost 200000
Designated Root      Address 00E0.0F64.8365  Priority 32768  Cost 0
CIST Regional Root   Address 00E0.0F64.8365  Priority 32768  Cost 0
Designated Root     Address 00E0.0F64.8365  Priority 32768  Port ID 128.1
Edge Port:   disabled               Link Type:  point-to-point (auto)
Bpdu Guard:  disabled (default)      Root Guard: disabled (default)
Loop Guard:  disabled (default)
Timers:  message expires in 0 sec, forward delay 0 sec, up time 662 sec
Number of transitions to forwarding state: 1
Bpdu sent 335, received 5
FastEthernet0/3 of MST00 is backup blocking
Port Info            Port ID 128.3          Priority 128    Cost 200000
Designated Root      Address 00E0.0F64.8365  Priority 32768  Cost 0
CIST Regional Root   Address 00E0.0F64.8365  Priority 32768  Cost 0
Designated Root     Address 00E0.0F64.8365  Priority 32768  Port ID 128.1
Edge Port:   disabled               Link Type:  point-to-point (auto)
Bpdu Guard:  disabled (default)      Root Guard: disabled (default)
Loop Guard:  disabled (default)
Timers:  message expires in 5 sec, forward delay 15 sec, up time 662 sec
Number of transitions to forwarding state: 0
Bpdu sent 5, received 335
FastEthernet0/47 of MST00 is designated forwarding
Port Info            Port ID 128.47         Priority 128    Cost 200000
Designated Root      Address 00E0.0F64.8365  Priority 32768  Cost 0
CIST Regional Root   Address 00E0.0F64.8365  Priority 32768  Cost 0
Designated Root     Address 00E0.0F64.8365  Priority 32768  Port ID 128.47
Edge Port:   enabled (auto)         Link Type:  point-to-point (auto)
Bpdu Guard:  disabled (default)      Root Guard: disabled (default)
```

Loop Guard: disabled (default)
Timers: message expires in 0 sec, forward delay 0 sec, up time 1485 sec
Number of transitions to forwarding state: 1
Bpdu sent 744, received 0
MST01 Vlans Mapped: 2
Root Address 00E0.0F64.8365 Priority 32769 (32768 mst-id 1)
Root This root for MST01

FastEthernet0/1 of MST01 is designated forwarding
Port Info Port ID 128.1 Priority 128 Cost 200000
Designated Root Address 00E0.0F64.8365 Priority 32769 Cost 0
Desingated Root Address 00E0.0F64.8365 Priority 32769 Port ID 128.1
Timers: message expires in 0 sec, forward delay 0 sec, up time 662 sec
Number of transitions to forwarding state: 1
MST Config Message transmitted 335, received 0
MST02 Vlans Mapped: 3
Root Address 00E0.0F64.8365 Priority 32770 (32768 mst-id 2)
Root This root for MST02
FastEthernet0/1 of MST02 is designated forwarding
Port Info Port ID 128.1 Priority 128 Cost 200000
Designated Root Address 00E0.0F64.8365 Priority 32770 Cost 0
Desingated Root Address 00E0.0F64.8365 Priority 32770 Port ID 128.1
Timers: message expires in 0 sec, forward delay 0 sec, up time 662 sec
Number of transitions to forwarding state: 1
MST Config Message transmitted 335, received 0

3.1.23. show spanning-tree mstp interface

Syntax

show spanning-tree mstp interface *interface-id*

The command above is used to check the information about the port which is run under MSTP.

Parameter

Parameter	Description

instance-id	Port name, such as “G5/1”, “GigaEthernet5/2”.

Default value

None

Usage Guidelines

None

Example

The following example shows the information about port G0/1 after you run the command Switch#show spanning-tree mstp interface g0/1:

GigaEthernet0/1 of MST00 is designated forwarding

Port Info Port ID 128.1 Priority 128 Cost 200000

Designated Root Address 00E0.0F64.8365 Priority 32768 Cost 0

CIST Regional Root Address 00E0.0F64.8365 Priority 32768 Cost 0

Designated Bridge Address 00E0.0F64.8365 Priority 32768 Port ID 128.1

Edge Port: disabled Link Type: point-to-point (auto)

Bpdu Guard: disabled (default) Root Guard: disabled (default)

Loop Guard: disabled (default)

Timers: message expires in 0 sec, forward delay 0 sec, up time 851 sec

Number of transitions to forwarding state: 1

Bpdu sent 430, received 5

GigaEthernet0/1 of MST01 is designated forwarding

Port Info Port ID 128.1 Priority 128 Cost 200000

Designated Root Address 00E0.0F64.8365 Priority 32769 Cost 0

Desingated Bridge Address 00E0.0F64.8365 Priority 32769 Port ID 128.1

Timers: message expires in 0 sec, forward delay 0 sec, up time 851 sec

Number of transitions to forwarding state: 1

MST Config Message transmitted 430, received 0

GigaEthernet0/1 of MST02 is designated forwarding

Port Info Port ID 128.1 Priority 128 Cost 200000

Designated Root Address 00E0.0F64.8365 Priority 32770 Cost 0

Desingated Bridge Address 00E0.0F64.8365 Priority 32770 Port ID 128.1

Timers: message expires in 0 sec, forward delay 0 sec, up time 851 sec

Number of transitions to forwarding state: 1

MST Config Message transmitted 430, received 0

```
Instance Role Sts Cost      Pri.Nbr Vlans Mapped
-------- ---- --- --------- ------- --------------------
0        Desg FWD 200000    128.1   1,4-4094
1        Desg FWD 200000    128.1   2
2          Desg FWD 200000    128.1   3
```

3.1.24. show spanning-tree mstp protocol-migration

Syntax

The command above is used to check the protocol conversion information when the port is running under MSTP.

show spanning-tree mstp protocol-migration

Parameter

None

Default value

None

Usage Guidelines

None

Example

The following example shows the information about protocol conversion after the command show spanning-tree mstp protocol-migration is run. Note that port G5/1 has transferred to the 802.1D STP mode.

```
Switch#show spanning-tree mstp protocol-migration
MSTP Port Protocol Migration
Interface       Protocol
--------------- ---------- ------------
G0/1            802.1D
```