Spanning Tree Commands

spanning-tree bpdu (Global)

To define Bridge Protocol Data Unit (BPDU) handling when the spanning tree is disabled globally or on a single interface, use the **spanning-tree bpdu** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

spanning-tree bpdu {**filtering** | **flooding**}
no spanning-tree bpdu

Syntax Description		
	filtering	Specifies that BPDU packets are filtered when the spanning tree is disabled on an interface.
	flooding	Specifies that untagged BPDU packets are flooded unconditionally (without applying VLAN rules) to all ports where spanning tree is disabled and the BPDU handling mode is flooding. Tagged BPDU packets are filtered.

Command Default The default setting is flooding.

Command Modes Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines The filtering and flooding modes are relevant when the spanning tree is disabled globally or on a single interface.

Example

The following example sets the BPDU packet handling mode to flooding when the spanning tree is disabled on an interface:

```
nfvis(config-switch)# spanning-tree bpdu flooding
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

spanning-tree forward-time

To configure the spanning-tree bridge forward time, which is the amount of time a port remains in the listening and learning states before entering the forwarding state, use the **spanning-tree forward-time** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

spanning-tree forward-time *seconds*
no spanning-tree forward-time

Syntax Description

seconds	Specifies the spanning-tree forward time in seconds. Valid range is from 4 to 30.

Command Default

15 seconds

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

When configuring the forwarding time, the following relationship should be maintained:

2 * (Forward-Time - 1) >= Max-Age >= 2 * (Hello-Time + 1)

Example

The following example configures the spanning tree bridge forwarding time to 25 seconds:

```
nfvis(config-switch)# spanning-tree forward-time 25
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

spanning-tree hello-time

To configure how often the device broadcasts Hello messages to other devices, use the **spanning-tree hello-time** command in switch configuration mode. To restore the default configuration, use the **no** form of this command

spanning-tree hello-time *seconds*
no spanning-tree hello-time

Syntax Description

seconds	Specifies the spanning-tree Hello time in seconds. Range is from 1 to 10.

Command Default

2 seconds

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

When configuring the Hello time, the following relationship should be maintained:

Max-Age >= 2*(Hello-Time + 1)

Example

The following example configures the spanning-tree bridge hello time to 5 seconds:

```
nfvis(config-switch)# spanning-tree hello-time 5
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

spanning-tree loopback-guard

To shut down an interface if it receives a loopback BPDU, use the **spanning-tree loopback-guard** command in switch configuration mode. To return to the default setting, use the **no** form of this command.

spanning-tree loopback-guard
no spanning-tree loopback-guard

Syntax Description

This command has no arguments.

Command Default

None

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

This enables shutting down all interfaces if a loopback BPDU is received on it.

Example

```
nfvis(config-switch)# spanning-tree loopback-guard
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

spanning-tree max-age

To configure the STP maximum age, use the **spanning-tree max-age** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

spanning-tree max-age *seconds*
no spanning-tree max-age

Syntax Description

seconds	Specifies the spanning-tree bridge maximum age in seconds. Valid range is from 6 to 40

Command Default

20 seconds.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

When configuring the maximum age, the following relationships should be maintained:

2*(Forward-Time - 1) >= Max-Age

Max-Age >= 2*(Hello-Time + 1)

Example

The following example sets the spanning-tree bridge maximum age to 10 seconds.

```
nfvis(config-switch)# spanning-tree max-age 10
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

spanning-tree mode

To select which Spanning Tree Protocol (STP) protocol to run, use the **spanning-tree mode** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

spanning-tree mode {**stp** | **rstp** | **mst**}
no spanning-tree mode

Syntax Description		
	stp	Specifies that STP is enabled.
	rstp	Specifies that the Rapid STP is enabled.
	mst	Specifies that the Multiple STP is enabled.

Command Default   The default is **rstp**.

Command Modes   Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines   In RSTP mode, the device uses STP when the neighbor device uses STP.

In MSTP mode, the device uses RSTP when the neighbor device uses RSTP, and uses STP when the neighbor device uses STP.

Example

The following example enables STP:

```
nfvis(config-switch)# spanning-tree mode stp
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

Example

The following example enables MST:

```
nfvis(config-switch)# spanning-tree mode mst
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

spanning-tree mst configuration

Use the **spanning-tree mst configuration** command to enable configuring an MST region by entering the MST mode.

spanning-tree mst configuration

Command Modes Switch configuration (config-switch)

Command History

Release	Modification
3.8.1	This command was introduced.

Usage Guidelines For two or more switches to be in the same MST region, they must contain the same VLAN mapping, the same configuration revision number, and the same name.

Example

The following example configures an MST region.

```
nfvis(config-switch)# spanning-tree mst configuration
nfvis(config-switch-mst)# instance 1 vlan 15
nfvis(config-switch-mst)# name mst_test
nfvis(config-switch-mst)# revision 2
nfvis(config-switch-mst)# commit
```

spanning-tree mst max-hops

Use the **spanning-tree mst max-hops** command to configure the number of hops in an MST region before the BDPU is discarded and the port information is aged out. Use the no form of this command to restore the default configuration.

spanning-tree mst max-hops *hop-count*
nospanning-tree mst max-hops

Syntax Description	*hop-count*	Specifies the number of hops in an MST region before the BDPU is discarded. Valid range is from 1 to 40.

Command Default The default number of hops is 20.

Command Modes Switch configuration (config-switch)

Command History

Release	Modification
3.8.1	This command was introduced.

Example

The following example configures the maximum number of hops that a packet travels in an MST region before it is discarded to 10.

```
nfvis(config-switch)# spanning-tree mst max-hops 10
nfvis(config-switch)# commit
```

spanning-tree mst port-priority

Use the **spanning-tree mst port-priority** command to configure the priority of a port. Use the no form of this command to restore the default configuration.

spanning-tree mst *instance-id* **port-priority** *priority*
nospanning-tree mst *instance-id* **port-priority**

Syntax Description

instance-id	Specifies the spanning tree instance ID. Valid range is from 1 to 15.
priority	Specifies the port priority. Valid range is from 0 to 240 in multiples of 16.

Command Default The default port priority is 128.

Command Modes Switch configuration (config-switch)

Command History

Release	Modification
3.8.1	This command was introduced.

Usage Guidelines The priority value must be a multiple of 16.

Example

The following example configures the port priority:

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# spanning-tree mst 1 port-priority 96
nfvis(config-switch-if)# spanning-tree mst 1 cost 2
nfvis(config-switch-if)# commit
```

spanning-tree pathcost method

To set the default path cost method, use the **spanning-tree pathcost** method in switch configuration mode. To return to the default configuration, use the **no** form of this command.

spanning-tree pathcost method {**long** | **short**}
no spanning-tree pathcost method

Syntax Description		
long	Use 32-bit based values for default port path costs.	
short	Use 16-bit based values for default port path costs.	

Command Default   Long path cost method.

Command Modes   Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines   This command applies to all the spanning tree instances on the switch.

- If the short method is selected, the switch calculates the default cost as 100.

- If the long method is selected, the switch calculates the default cost as 20000.

Example

The following example sets the default path cost method to Long.

```
nfvis(config-switch)# spanning-tree pathcost method long
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

spanning-tree priority

To configure the device STP priority, which is used to determine which bridge is selected as the root bridge, use the **spanning-tree priority** command in switch configuration mode. To restore the default device spanning-tree priority, use the **no** form of this command

spanning-tree priority *priority*
no spanning-tree priority

Syntax Description

priority	Specifies the bridge priority. Valid range is from 0 to 61440.

Command Default   The default priority is 32768.

Command Modes   Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines   The priority value must be a multiple of 4096.

The switch with the lowest priority is the root of the spanning tree. When more than one switch has the lowest priority, the switch with the lowest MAC address is selected as the root.

Example

The following example configures the spanning-tree priority to 12288:

```
nfvis(config-switch)# spanning-tree priority 12288
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

spanning-tree enable

To enable the spanning-tree functionality, use the **spanning-tree enable** command in switch configuration mode. To disable the spanning-tree functionality, use the **no** form of this command.

spanning-tree enable
no spanning-tree enable

Syntax Description   This command has no arguments.

Command Default   Spanning-tree is enabled.

Command Modes   Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example enables the spanning-tree functionality:

```
nfvis(config-switch)# spanning-tree enable
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

spanning-tree bpdu (Interface)

To define Bridge Protocol Data Unit (BPDU) handling when the spanning tree is disabled on a single interface, use the **spanning-tree bpdu** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

spanning-tree bpdu {**filtering** | **flooding**}
no spanning-tree bpdu

Syntax Description

filtering	Specifies that BPDU packets are filtered when the spanning tree is disabled on an interface.
flooding	Specifies that untagged BPDU packets are flooded unconditionally (without applying VLAN rules) to all ports with the spanning tree disabled and the BPDU handling mode of flooding. Tagged BPDU packets are filtered.

Command Default

The **spanning-tree bpdu (Global)** command determines the default configuration.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

The filtering and flooding modes are relevant when the spanning tree is disabled globally or on a single interface.

Example

The following example defines the BPDU packet as flooding when the spanning tree is disabled on Gigabit Ethernet interface 1/1:

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# spanning-tree bpdu flooding
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

spanning-tree bpduguard

To shut down an interface when it receives a Bridge Protocol Data Unit (BPDU), use the **spanning-tree bpduguard** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

spanning-tree bpduguard {**enable** | **disable**}
no spanning-tree bpduguard

Syntax Description		
	enable	Enables BPDU Guard.
	disable	Disables BPDU Guard.

Command Default   BPDU Guard is disabled.

Command Modes   Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History	Release	Modification
	3.5.1	This command was introduced.

Usage Guidelines   BPDU guard can be enabled when the spanning tree is enabled (useful when the port is in the PortFast mode) or disabled.

Example

The following example shuts down the Gigabit Ethernet interface 1/1 when it receives a BPDU.

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# spanning-tree bpduguard enable
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

spanning-tree cost

To configure the spanning-tree path cost for a port, use the **spanning-tree cost** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

spanning-tree cost *cost*
no spanning-tree cost

Syntax Description

cost	Specifies the port path cost. Valid range is from 1 to 200000000.

Command Default

Default path cost is determined by port speed and path cost method (long or short).

Table 1:

Interface	Long	Short
Port-channel	20,000	4
Gigabit Ethernet (1000 Mbps)	20,000	4
Ethernet (10 Mbps)	2,000,000	100

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example configures the spanning-tree cost on Gigabit Ethernet interface 1/1 to 35000.

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# spanning-tree cost 35000
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

spanning-tree guard root

To enable root guard on all spanning-tree instances on an interface, use the **spanning-tree guard root** command in interface switch configuration mode. Root guard prevents the interface from becoming the root port of the device. Use the **no** form of this command to disable the root guard on the interface.

spanning-tree guard root
no spanning-tree guard root

Syntax Description	This command has no arguments.

Command Default	Root guard is disabled.

Command Modes	Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

Root guard can be enabled when the device operates in any mode (STP, RSTP, and MSTP).

When root guard is enabled, the port changes to the alternate state if the spanning-tree calculations select the port as the root port.

Example

The following example prevents Gigabit Ethernet interface 1/1 from being the root port of the device.

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# spanning-tree guard root
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

spanning-tree link-type

To override the default link-type setting determined by the port duplex mode, and enable RSTP transitions to the Forwarding state, use the **spanning-tree link-type** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

spanning-tree link-type {**point-to-point** | **shared**}
no spanning-tree link-type

Syntax Description

point-to-point	Specifies that the port link type is point-to-point.
shared	Specifies that the port link type is shared.

Command Default The device derives the port link type from the duplex mode. A full-duplex port is considered a point-to-point link and a half-duplex port is considered a shared link.

Command Modes Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example enables shared spanning-tree on Gigabit Ethernet interface 1/1.

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# spanning-tree link-type shared
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

spanning-tree port-priority

To configure the port priority, use the **spanning-tree port-priority** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

spanning-tree port-priority *priority*
no spanning-tree port-priority

Syntax Description

priority	Specifies the port priority. Valid range is from 0 to 240.

Command Default The default port priority is 128.

Command Modes Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines The priority value must be a multiple of 16.

Example

The following example configures the spanning priority on Gigabit Ethernet interface 1/1 to 96.

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# spanning-tree port-priority 96
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

spanning-tree portfast

To enable the PortFast mode, use the **spanning-tree portfast** command in interface switch configuration mode. In PortFast mode, the interface is immediately put into the forwarding state upon linkup, without waiting for the standard forward time delay. To disable the PortFast mode, use the **no** form of this command.

spanning-tree portfast {**auto** | **enable**}
no spanning-tree portfast

Syntax Description

auto	Specifies that the software waits for 3 seconds (with no BPDUs received on the interface) before putting the interface into the PortFast mode.
enable	Enables an interface to move directly to forwarding on linkup.

Command Default   PortFast mode is disabled.

Command Modes   Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example enables the PortFast mode on Gigabit Ethernet interface 1/1:

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# spanning-tree portfast enable
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

show spanning-tree

To display the spanning-tree configuration, use the **show switch spanning-tree** command in privileged EXEC mode.

show switch spanning-tree mstp configuration { **global** | **instance-list** }
show switch spanning-tree mstp summary { **instance-global-info** | **instance-interface-info 2** }

Syntax Description		
mstp configuration	Displays the MST configuration identifier.	
summary	Displays the spanning-tree summary.	

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
3.8.1	This command was introduced.

Usage Guidelines This command only works when MST is enabled.

Example

The following is a sample output of the **show switch spanning-tree mstp configuration global** command:

```
nfvis# show switch spanning-tree mstp configuration global
spanning-tree mstp configuration global name transit-net
spanning-tree mstp configuration global revision 2
spanning-tree mstp configuration global max-hops 20
```

The following is a sample output of the **show switch spanning-tree mstp configuration instance-list** command:

```
nfvis# show switch spanning-tree mstp configuration instance-list
INSTANCE   VLANS MAPPED      STATE
-----------------------------------
0          1,2350-2353,2363  enabled
1          15                enabled
```

show switch spanning-tree

To display the spanning-tree configuration, use the **show switch spanning-tree** command in privileged EXEC mode.

switch show spanning-tree [**bridge** | **interface** {**gigabitEthernet** | **port-channel**} *interface-id* | **root** | **summary**]

Syntax Description		
	bridge	Displays the bridge information.
	interface	Specifies the interface type.
	gigabitEthernet	Specifies Gigabit Ethernet as the interface type.
	port-channel	Specifies port channel as the interface type.
	interface-id	Specifies the interface ID.
	root	Displays the bridge information.
	summary	Displays the spanning-tree summary.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines   None

Example

The following is a sample output of the **show switch spanning-tree** command

```
nfvis# show switch spanning-tree
spanning-tree summary admin-status enabled
spanning-tree summary Operation-mode RSTP
spanning-tree summary Port-Cost-Method long
spanning-tree summary Loopback-guard disabled
spanning-tree root Priority 32768
spanning-tree root Address 00:a6:ca:d6:38:50
spanning-tree root Cost 0
spanning-tree root Port 0
spanning-tree root Hello-Time 2
spanning-tree root Max-Age 20
spanning-tree root Forward-Delay 15
spanning-tree bridge Priority 32768
spanning-tree bridge Address 00:a6:ca:d6:38:50
spanning-tree bridge Hello-Time 2
spanning-tree bridge Max-Age 20
```

```
spanning-tree bridge Forward-Delay 15
        ADMIN    PRIO.               PORT                  PORT          GUARD
PORT    STATE    NBR      COST       STATE     ROLE        FAST  TYPE    ROOT
-------------------------------------------------------------------------------
gi1/0   enabled  128.1    2000000    disabled  Disable     No    --      disabled
gi1/1   enabled  128.2    2000000    disabled  Disable     No    --      disabled
gi1/2   enabled  128.3    2000000    disabled  Disable     No    --      disabled
gi1/3   enabled  128.4    2000000    disabled  Disable     No    --      disabled
gi1/4   enabled  128.5    2000000    disabled  Disable     No    --      disabled
gi1/5   enabled  128.6    2000000    disabled  Disable     No    --      disabled
gi1/6   enabled  128.7    2000000    disabled  Disable     No    --      disabled
gi1/7   enabled  128.8    2000000    disabled  Disable     No    --      disabled

        ADMIN    PRIO.               PORT                  PORT          GUARD
PORT    STATE    NBR      COST       STATE     ROLE        FAST  TYPE    ROOT
-------------------------------------------------------------------------------
1       enabled  128.1000  20000     disabled  Disable     No    --      disabled
2       enabled  128.1001  20000     disabled  Disable     No    --      disabled
3       enabled  128.1002  20000     disabled  Disable     No    --      disabled
4       enabled  128.1003  20000     disabled  Disable     No    --      disabled
```