



# Configuring Spanning-Tree Protocol

The Cisco ME 1200 Series Carrier Ethernet Access Device supports Spanning-Tree Protocol (STP), and this chapter describes how to configure the STP on port-based VLANs. On the Cisco ME 1200 NID, the STP is enabled by default on physical interfaces.

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## Prerequisites for Configuring Spanning-Tree Protocol

- NID must be added to the controller.
- NID must be accessible from the controller.

## Information About Spanning-Tree Protocol

STP is a Layer 2 link management protocol that provides path redundancy while preventing loops in the network.

For a Layer 2 Ethernet network to function properly, only one active path can exist between any two stations. Multiple active paths among end stations cause loops in the network. If a loop exists in the network, end stations might receive duplicate messages. Devices might also learn end-station MAC addresses on multiple Layer 2 interfaces. These conditions result in an unstable network. Spanning-tree operation is transparent to end stations, which cannot detect whether they are connected to a single LAN segment or a switched LAN of multiple segments.

The STP uses a spanning-tree algorithm to select one switch of a redundantly connected network as the root of the spanning tree. The algorithm calculates the best loop-free path through a switched Layer 2 network by assigning a role to each port based on the role of the port in the active topology:

- Root—A forwarding port elected for the spanning-tree topology
- Designated—A forwarding port elected for every switched LAN segment
- Alternate—A blocked port providing an alternate path to the root bridge in the spanning tree
- Backup—A blocked port in a loopback configuration

The switch that has *all* of its ports as the designated role or the backup role is the root switch. The switch that has at least *one* of its ports in the designated role is called the designated switch.

Spanning tree forces redundant data paths into a standby (blocked) state. If a network segment in the spanning tree fails and a redundant path exists, the spanning-tree algorithm recalculates the spanning-tree topology and activates the standby path. Switches send and receive spanning-tree frames, called bridge protocol data units (BPDUs), at regular intervals. The switches do not forward these frames but use them to construct a loop-free path. BPDUs contain information about the sending switch and its ports, including switch and MAC addresses, switch priority, port priority, and path cost. Spanning tree uses this information to elect the root switch and root port for the switched network and the root port and designated port for each switched segment.

When two ports on a switch are part of a loop, the spanning-tree port priority and path cost settings control which port is put in the forwarding state and which is put in the blocking state. The spanning-tree port priority value represents the location of a port in the network topology and how well it is located to pass traffic. The path cost value represents the media speed.


**Note**


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The switch sends keepalive messages (to ensure the connection is up) only on interfaces that do not have small form-factor pluggable (SFP) modules.

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### Spanning-Tree Topology and BPDU

The stable, active spanning-tree topology of a switched network is controlled by these elements:

- The unique bridge ID (switch priority and MAC address) associated with each VLAN on each switch.
- The spanning-tree path cost to the root switch.
- The port identifier (port priority and MAC address) associated with each Layer 2 STP-enabled interface.

When the switches in a network are powered up, each functions as the root switch. Each switch sends a configuration BPDU through all of its ports, or on the Cisco ME device, only through the STP-enabled ports. The BPDUs communicate and compute the spanning-tree topology. Each configuration BPDU contains this information:

- The unique bridge ID of the switch that the sending switch identifies as the root switch
- The spanning-tree path cost to the root
- The bridge ID of the sending switch
- Message age
- The identifier of the sending interface
- Values for the hello, forward delay, and max-age protocol timers

When a switch receives a configuration BPDU that contains superior information (lower bridge ID, lower path cost, and so forth), it stores the information for that port. If this BPDU is received on the root port of the switch, the switch also forwards it with an updated message to all attached LANs for which it is the designated switch.

If a switch receives a configuration BPDU that contains inferior information to that currently stored for that port, it discards the BPDU. If the switch is a designated switch for the LAN from which the inferior BPDU was received, it sends that LAN a BPDU containing the up-to-date information stored for that port. In this way, inferior information is discarded, and superior information is propagated on the network.

For more information on BPDUs, see [Configuring Optional Spanning-Tree features](#).

### Spanning-Tree Interface States

Propagation delays can occur when protocol information passes through a switched LAN. As a result, topology changes can take place at different times and at different places in a switched network. When an STP port transitions directly from nonparticipation in the spanning-tree topology to the forwarding state, it can create temporary data loops. Interfaces must wait for new topology information to propagate through the switched LAN before starting to forward frames. They must allow the frame lifetime to expire for forwarded frames that have used the old topology.

Each Layer 2 interface on a switch using spanning tree exists in one of these states:

- Blocking—The interface does not participate in frame forwarding.
- Listening—The first transitional state after the blocking state when the spanning tree determines that the interface should participate in frame forwarding.
- Learning—The interface prepares to participate in frame forwarding.
- Forwarding—The interface forwards frames.
- Disabled—The interface is not participating in spanning tree because of a shutdown port, no link on the port, or no spanning-tree instance running on the port.

### Configuring Port Priority

If a loop occurs, spanning tree uses the port priority when selecting a spanning-tree port to put into the forwarding state. You can assign higher priority values (lower numerical values) to ports that you want selected first and lower priority values (higher numerical values) to ones that you want selected last. If all spanning-tree ports have the same priority value, spanning tree puts the port with the lowest interface number in the forwarding state and blocks the other interfaces.

### Configuring Path Cost

The spanning-tree path cost default value is derived from the media speed of an interface (port running spanning tree or port channel of multiple ports running spanning tree). If a loop occurs, spanning tree uses cost when selecting an interface to put in the forwarding state. You can assign lower cost values to interfaces that you want selected first and higher cost values that you want selected last. If all NNIs (or port channels) have the same cost value, spanning tree puts the interface with the lowest interface number in the forwarding state and blocks the other interfaces.

### Configuring the Switch Priority of a VLAN

You can configure the switch priority and make it more likely that the switch is chosen as the root switch.

### Admin Edge and Auto Edge

These two values control how a port is declared to be an edge port or not. An edge port, is a port which is not connected to a bridge. If auto edge is enabled, then the port determine whether a port is an edge port by registering for BPDUs, and if BPDUs are received on that port.

The admin edge determines what the port should start as being – edge or not.

#### Restricted Role and Restricted TCN

If restricted role is enabled, it causes the port not to be selected as Root Port for the Common and Internal Spanning Tree (CIST) or any Multiple Spanning Tree Instance (MSTI), even if it has the best spanning tree priority vector. Such a port is selected as an Alternate Port after the Root Port has been selected. If set, it can cause lack of spanning tree connectivity. It can be set by a network administrator to prevent bridges external to a core region of the network influence the spanning tree active topology, possibly because those bridges are not under the full control of the administrator. This feature is also known as Root Guard.

If restricted TCN is enabled, it causes the port not to propagate received topology change notifications and topology changes to other ports. If set it can cause temporary loss of connectivity after changes in a spanning tree's active topology as a result of persistently incorrect learned station location information. It is set by a network administrator to prevent bridges external to a core region of the network, causing address flushing in that region, possibly because those bridges are not under the full control of the administrator or the physical link state of the attached LANs transits frequently.

## Understanding Spanning-Tree Modes and Protocols

The switch ports support the following spanning-tree modes and protocols:

- **MSTP**—This spanning-tree mode is based on the IEEE 802.1s standard. You can map multiple VLANs to the same spanning-tree instance, which reduces the number of spanning-tree instances required to support a large number of VLANs. The MSTP runs on top of the RSTP (based on IEEE802.1w), which provides for rapid convergence of the spanning tree by eliminating the forward delay and by quickly transitioning root ports and designated ports to the forwarding state. You cannot run MSTP without RSTP.

The most common initial deployment of MSTP is in the backbone and distribution layers of a Layer 2 switched network. For more information, see [Configuring MSTP](#).

## Understanding MSTP Configuration

This section describes how to configure the Cisco implementation of the IEEE 802.1s Multiple STP (MSTP) on the Cisco ME 1200 NID. STP is enabled by default on switch ports.



#### Note

The multiple spanning-tree (MST) implementation is a pre-standard implementation. It is based on the draft version of the IEEE standard.

The MSTP enables multiple VLANs to be mapped to the same spanning-tree instance, thereby reducing the number of spanning-tree instances needed to support a large number of VLANs. The MSTP provides for multiple forwarding paths for data traffic and enables load balancing. It improves the fault tolerance of the network because a failure in one instance (forwarding path) does not affect other instances (forwarding paths). The most common initial deployment of MSTP is in the backbone and distribution layers of a Layer 2 switched network. This deployment provides the highly available network required in a service-provider environment.

Both MSTP and RSTP improve the spanning-tree operation and maintain backward compatibility with equipment that is based on the (original) 802.1D spanning tree, with existing Cisco-proprietary Multiple Instance STP (MISTP).

### Understanding MSTP

MSTP, which uses RSTP for rapid convergence, enables VLANs to be grouped into a spanning-tree instance, with each instance having a spanning-tree topology independent of other spanning-tree instances. This architecture provides multiple forwarding paths for data traffic, enables load balancing, and reduces the number of spanning-tree instances required to support a large number of VLANs.

### Multiple Spanning-Tree Regions

For the NID to participate in multiple spanning-tree (MST) instances, you must consistently configure the switches with the same MST configuration information. A collection of interconnected NIDs that have the same MST configuration comprises an MST region. The MST configuration controls to which MST region each switch belongs. The configuration includes the name of the region, the revision number, and the MST VLAN-to-instance assignment map. You configure the NID for a region by using the global configuration command, after which the NID enters the MST configuration mode. From this mode, you can map VLANs to an MST instance by using the instance MST configuration command, specify the region name by using the name MST configuration command, and set the revision number by using the revision MST configuration command. A region can have one member or multiple members with the same MST configuration; each member must be capable of processing RSTP bridge protocol data units (BPDUs). There is no limit to the number of MST regions in a network, but each region can support up to 65 spanning-tree instances. You can assign a VLAN to only one spanning-tree instance at a time.

### IST, CIST, and CST

The MSTP establishes and maintains two types of spanning trees, IST and CIST:

- An internal spanning tree (IST), which is the spanning tree that runs in an MST region. Within each MST region, the MSTP maintains multiple spanning-tree instances. Instance 0 is a special instance for a region, known as the internal spanning tree (IST). All other MST instances are numbered from 1 to 4094. The IST is the only spanning-tree instance that sends and receives BPDUs; all of the other spanning-tree instance information is contained in M-records, which are encapsulated within MSTP BPDUs. Because the MSTP BPDU carries information for all instances, the number of BPDUs that need to be processed by a switch to support multiple spanning-tree instances is significantly reduced. All MST instances within the same region share the same protocol timers, but each MST instance has its own topology parameters, such as root switch ID, root path cost, and so forth. By default, all VLANs are assigned to the IST. An MST instance is local to the region; for example, MST instance 1 in region A is independent of MST instance 1 in region B, even if regions A and B are interconnected.
- A common and internal spanning tree (CIST), which is a collection of the ISTs in each MST region, and the common spanning tree (CST) that interconnects the MST regions and single spanning trees. The spanning tree computed in a region appears as a subtree in the CST that encompasses the entire switched domain. The CIST is formed as a result of the spanning-tree algorithm running between switches that support the IEEE 802.1w, IEEE 802.1s, and IEEE 802.1D protocols. The CIST inside an MST region is the same as the CST outside a region.

For information regarding *Operations Within an MST Region*, *Operations Between MST Regions*, *IEEE 802.1s Terminology*, see [Configuring MSTP](#).

### Hop Count

The IST and MST instances do not use the message-age and maximum-age information in the configuration BPDU to compute the spanning-tree topology. Instead, they use the path cost to the root and a hop-count mechanism similar to the IP time-to-live (TTL) mechanism.

By using the global configuration command, you can configure the maximum hops inside the region and apply it to the IST and all MST instances in that region. The hopcount achieves the same result as the message-age information (trigger a reconfiguration). The root switch of the instance always sends a BPDU (or M-record) with a cost of 0 and the hop count set to the maximum value. When a switch receives this BPDU, it decrements the received remaining hop count by one and propagates this value as the remaining hop count in the BPDUs it generates. When the count reaches zero, the switch discards the BPDU and ages the information held for the port. The message-age and maximum-age information in the RSTP portion of the BPDU remain the same throughout the region, and the same values are propagated by the region's designated ports at the boundary.

## Understanding RSTP

The RSTP takes advantage of point-to-point wiring and provides rapid convergence of the spanning tree. Reconfiguration of the spanning tree can occur in less than 1 second (in contrast to 50 seconds with the default settings in the IEEE 802.1D spanning tree), which is critical for networks carrying delay-sensitive traffic such as voice and video.

## Understanding BPDU Guard and BPDU Filtering

### BPDU Guard

The BPDU guard feature can be globally enabled on the switch or can be enabled per interface, but the feature operates with some differences.

At the global level, you enable BPDU guard on Port Fast-enabled STP ports by using the default global configuration command. Spanning tree shuts down STP ports that are in a Port Fast-operational state if any BPDU is received on those ports. In a valid configuration, Port Fast-enabled STP ports do not receive BPDUs. Receiving a BPDU on a Port Fast-enabled port signals an invalid configuration, such as the connection of an unauthorized device, and the BPDU guard feature puts the interface in the error-disabled state.

At the interface level, you enable BPDU guard on any STP port by using the interface configuration command without also enabling the Port Fast feature. When the STP port receives a BPDU, it is put in the error-disabled state. The BPDU guard feature provides a secure response to invalid configurations because you must manually put the interface back in service. Use the BPDU guard feature in a service-provider network to prevent an access port from participating in the spanning tree. You can enable the BPDU guard feature for the entire switch or for an interface.

### BPDU Filtering

The BPDU filtering feature can be globally enabled on the switch or can be enabled per interface, but the feature operates with some differences.

At the global level, you can enable BPDU filtering on Port Fast-enabled STP ports by using the default global configuration command. This command prevents interfaces that are in a Port Fast-operational state from sending or receiving BPDUs. The interfaces still send a few BPDUs at link-up before the switch begins to filter outbound BPDUs. You should globally enable BPDU filtering on a switch so that hosts connected to these ports do not receive BPDUs. If a BPDU is received on a Port Fast-enabled STP port, the interface loses its Port Fast-operational status, and BPDU filtering is disabled.

At the interface level, you can enable BPDU filtering on any STP port by using the interface configuration command without also enabling the Port Fast feature. This command prevents the interface from sending or receiving BPDUs.



**Note** Enabling BPDU filtering on an STP port is the same as disabling spanning tree on it and can result in spanning-tree loops.

You can enable the BPDU filtering feature for the entire NID or for an STP port.

For more information on BPDUs, see [Understanding BPDUs](#).

# How to Configure Spanning-Tree Protocol

## Configuring Spanning-tree Aggregation Port Configurations

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>configure terminal</b>  <b>Example:</b> Switch# configure terminal	Enters global configuration mode.
Step 2	<b>controller nid <i>1/NID_ID</i></b>  <b>Example:</b> Switch(config)# controller nid 1/1	Enters the controller configuration mode.
Step 3	<b>ProvisionStpPortType</b>  <b>Example:</b> Switch (config-controller)# ProvisionStpPortType	Enters the ProvisionStpPortType mode.
Step 4	<b>setStpaggConfig stpAggrConfig {auto-edge {enable   disable}   bpdu-guardbpdu-guard {enable   disable}   edge {enable   disable}   link-type {auto   point-to   shared} {enable   disable}   mst instance <i>instance-id</i> {active {enable   disable}   cost {auto   cost-range <i>cost_range</i>}   port-priority <i>port_priority</i> }   restricted-role {enable   disable}   restricted-tcn {enable   disable}}</b>  <b>Example:</b>  Switch(config-controller-ProvisionStpPortType)# setStpAggConfig stpAggrConfig auto-edge enable  Switch(config-controller-ProvisionStpPortType)# setStpAggConfig stpAggrConfig bpdu-guard disable  Switch(config-controller-ProvisionStpPortType)# setStpAggConfig stpAggrConfig edge disable  Switch(config-controller-ProvisionStpPortType)# setStpAggConfig stpAggrConfig link-type auto enable	Configures the spanning-tree port configuration: <ul style="list-style-type: none"> <li>• <b>stpPortConfig</b>—Sets the spanning-tree port configuration.</li> <li>• <b>auto-edge</b>—Detects the auto-edge status.               <ul style="list-style-type: none"> <li>◦ <b>enable</b>—Enables the auto-edge</li> <li>◦ <b>disable</b>—Disables the auto-edge</li> </ul> </li> <li>• <b>bpdu-guard</b>—Configures the BPDU guard.               <ul style="list-style-type: none"> <li>◦ <b>enable</b>—Enables the bpdu-guard</li> <li>◦ <b>disable</b>—Disables the bpdu-guard</li> </ul> </li> <li>• <b>edge</b>—Configures the edge port.               <ul style="list-style-type: none"> <li>◦ <b>enable</b>—Enables the edge.</li> </ul> </li> </ul>

Command or Action	Purpose
<pre>Switch(config-controller-ProvisionStpPortType) # setStpAggConfig stpAggrConfig link-type point-to disable  Switch(config-controller-ProvisionStpPortType) # setStpAggConfig stpAggrConfig link-type shared disable  Switch(config-controller-ProvisionStpPortType) # setStpAggConfig stpAggrConfig mst instance 0 active enable  Switch(config-controller-ProvisionStpPortType) # setStpAggConfig stpAggrConfig mst instance 0 cost auto  Switch(config-controller-ProvisionStpPortType) # setStpAggConfig stpAggrConfig mst instance 0 cost cost-range 1  Switch(config-controller-ProvisionStpPortType) # setStpAggConfig stpAggrConfig mst instance 0 port-priority 1  Switch(config-controller-ProvisionStpPortType) # setStpAggConfig stpAggrConfig restricted-role enable  Switch(config-controller-ProvisionStpPortType) # setStpAggConfig stpAggrConfig restricted-tcn disable</pre>	<ul style="list-style-type: none"> <li>◦ <b>disable</b>—Disables the edge.</li> <li>• <b>link-type</b>—Configures the port link-type.       <ul style="list-style-type: none"> <li>◦ <b>auto</b>—Configures the link-type as auto.           <ul style="list-style-type: none"> <li>◦ <b>enable</b>—Enables the link-type as auto.</li> <li>◦ <b>disable</b>—Disables the link-type as auto.</li> </ul> </li> <li>◦ <b>point-to</b>—Forces the link-type as point-to-point.           <ul style="list-style-type: none"> <li>◦ <b>enable</b>—Enables the link-type as point-to.</li> <li>◦ <b>disable</b>—Disables the link-type as point-to.</li> </ul> </li> <li>◦ <b>shared</b>—Forces the link-type as shared.           <ul style="list-style-type: none"> <li>◦ <b>enable</b>—Enables the link-type as shared.</li> <li>◦ <b>disable</b>—Disables the link-type as shared.</li> </ul> </li> </ul> </li> <li>• <b>mst</b>—Configures the STP bridge instance.       <ul style="list-style-type: none"> <li>◦ <i>instance</i>—Instance. The range is from 0 to 7 where CIST=0, MST2=1 and so on.</li> <li>◦ <b>active</b>—Adds or removes an instance.           <ul style="list-style-type: none"> <li>◦ <b>enable</b>—Enables the mst instance as active.</li> <li>◦ <b>disable</b>—Disables the mst instance as active.</li> </ul> </li> <li>◦ <b>cost</b>—Configures the STP cost for the port.           <ul style="list-style-type: none"> <li>◦ <b>auto</b>—Uses auto cost.</li> <li>◦ <i>cost-range</i>—Cost. The range is from 1-200000000.</li> <li>◦ <i>port-priority</i>—STP priority of the port. The range is from 0 to 240.</li> </ul> </li> </ul> </li> <li>• <b>restricted-role</b>—Configures the port role. It is restricted (and never a root port).       <ul style="list-style-type: none"> <li>◦ <b>enable</b>—Enables the port as having restricted role.</li> <li>◦ <b>disable</b>—Disables the port as having restricted role.</li> </ul> </li> </ul>



	Command or Action	Purpose
		<ul style="list-style-type: none"> <li>• <b>restricted-tcn</b>—Restricts the topology change notifications. <ul style="list-style-type: none"> <li>◦ <b>enable</b>—Enables the restricted TCN.</li> <li>◦ <b>disable</b>—Disables the restricted TCN.</li> </ul> </li> </ul>
<b>Step 5</b>	<b>setStpAggConfig review</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# setStpAggConfig review	Displays the configuration.
<b>Step 6</b>	<b>setstpPortConfig commit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# setStpAggConfig commit	Sends the configuration to the NID.
<b>Step 7</b>	<b>exit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# exit	Exits to the config-controller mode.

### Configuration Example

```

Switch# configure terminal
Switch(config)# controller nid 1/1
Switch(config-controller)# ProvisionStpPortType
Switch(config-controller-ProvisionStpPortType)# setStpAggConfig stpAggrConfig auto-edge
enable
Switch(config-controller-ProvisionStpPortType)# setStpAggConfig stpAggrConfig bpdu-guard
disable
Switch(config-controller-ProvisionStpPortType)# setStpAggConfig stpAggrConfig edge disable
Switch(config-controller-ProvisionStpPortType)# setStpAggConfig stpAggrConfig link-type
auto enable
Switch(config-controller-ProvisionStpPortType)# setStpAggConfig stpAggrConfig link-type
point-to disable
Switch(config-controller-ProvisionStpPortType)# setStpAggConfig stpAggrConfig link-type
shared disable
Switch(config-controller-ProvisionStpPortType)# setStpAggConfig stpAggrConfig mst instance
0 active enable
Switch(config-controller-ProvisionStpPortType)# setStpAggConfig stpAggrConfig mst instance
0 cost auto
Switch(config-controller-ProvisionStpPortType)# setStpAggConfig stpAggrConfig mst instance
0 cost cost-range 1
Switch(config-controller-ProvisionStpPortType)# setStpAggConfig stpAggrConfig mst instance
0 port-priority 1
Switch(config-controller-ProvisionStpPortType)# setStpAggConfig stpAggrConfig restricted-role
enable
Switch(config-controller-ProvisionStpPortType)# setStpAggConfig stpAggrConfig restricted-tcn
disable
Switch(config-controller-ProvisionStpPortType)# setStpAggConfig review

```

Commands in queue:

```
setStpAggConfig stpAggrConfig auto-edge enable
```

```

setStpAggConfig stpAggrConfig bpdu-guard disable
setStpAggConfig stpAggrConfig edge disable
setStpAggConfig stpAggrConfig link-type auto enable
setStpAggConfig stpAggrConfig link-type point-to disable
setStpAggConfig stpAggrConfig link-type shared disable
setStpAggConfig stpAggrConfig mst instance 0 active enable
setStpAggConfig stpAggrConfig mst instance 0 cost auto
setStpAggConfig stpAggrConfig mst instance 0 cost cost-range 1
setStpAggConfig stpAggrConfig mst instance 0 port-priority 1
setStpAggConfig stpAggrConfig restricted-role enable
setStpAggConfig stpAggrConfig restricted-tcn disable

```

```
Switch(config-controller-ProvisionStpPortType)# setStpAggConfig commit
```

```
SetStpAggConfig Commit Success!!!
```

```
Switch(config-controller-ProvisionStpPortType)# exit
```

## Viewing Spanning-Tree Aggregation Port Configurations

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Switch# configure terminal	Enters global configuration mode.
<b>Step 2</b>	<b>controller nid 1/NID_ID</b>  <b>Example:</b> Switch(config)# controller nid 1/1	Enters the controller configuration mode.
<b>Step 3</b>	<b>ProvisionStpPortType</b>  <b>Example:</b> Switch (config-controller)# ProvisionStpPortType	Enters the ProvisionStpPortType mode.
<b>Step 4</b>	<b>getstpaggConfig getStpAggConfigRequest</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# getstpaggConfig getStpAggConfigRequest	Displays the configuration.
<b>Step 5</b>	<b>getstpaggConfig commit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# setStpAggConfig commit	Sends the configuration to the NID.
<b>Step 6</b>	<b>exit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# exit	Exits to the config-controller mode.

```

Switch# configure terminal
Switch(config)# controller nid 1/1
Switch(config-controller)# ProvisionStpPortType
Switch(config-controller-ProvisionStpPortType)# getstppaggConfig getStpAggConfigRequest

    stpAggrConfig.auto_edge = false
    stpAggrConfig.bpdu_guard = true
    stpAggrConfig.edge = false
    stpAggrConfig.link_type.t = 1
    stpAggrConfig.link_type.u.auto_ = false
    stpAggrConfig.mst.instance[0].active = true
    stpAggrConfig.mst.instance[0].cost.t = 1
    stpAggrConfig.mst.instance[0].cost.u.cost_range = 1
    stpAggrConfig.mst.instance[0].port_priority = 1
    stpAggrConfig.restricted_role = false
    stpAggrConfig.restricted_tcn = true

Switch(config-controller-ProvisionStpPortType)# getstppaggConfig commit

    GetstppaggConfig Commit Success!!!

Switch(config-controller-ProvisionStpPortType)# exit

```

## Configuring Spanning-Tree Global Configurations

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>configure terminal</b>  <b>Example:</b> Switch# configure terminal	Enters global configuration mode.
Step 2	<b>controller nid 1/NID_ID</b>  <b>Example:</b> Switch(config)# controller nid 1/1	Enters the controller configuration mode.
Step 3	<b>ProvisionStpPortType</b>  <b>Example:</b> Switch (config-controller)# ProvisionStpPortType	Enters the ProvisionStpPortType mode.
Step 4	<b>setStpglobalConfig stpGlobalConfig {edge {bpdu-filter   bpdu-guard} {enable   disable}   mode {mstp   rstp   stp} {enable   disable}   mst {forward-time <i>Fwdtime</i>   instance <i>instance</i> {active {enable   disable}   priority <i>Prio</i>   vlan <i>WORD</i>}   max-age <i>Maxage</i>   max-hops <i>Maxhops</i>   name <i>Name</i>   revision <i>Revision</i> }   port-number <i>Port number</i> {enable   disable}   recovery <i>Interval</i>   transmit <i>hold-count</i> }</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)#	Configures the spanning-tree global configuration. <ul style="list-style-type: none"> <li>• <b>stpGlobalConfig</b>—Sets the spanning-tree global configuration.</li> <li>• <b>edge</b>—Configures the edge ports. <ul style="list-style-type: none"> <li>◦ <b>bpdu-filter</b>—Enables or disables the BPDU filter (stop BPDU tx/rx).</li> <li>◦ <b>bpdu-guard</b>—Enables or disables the BPDU guard.</li> </ul> </li> </ul>

Command or Action	Purpose
<pre>setStpGlobalConfig stpGlobalConfig edge bpdu-guard enable  Switch(config-controller-ProvisionStpPortType) # setStpGlobalConfig stpGlobalConfig mode mstp enable  Switch(config-controller-ProvisionStpPortType) # setStpGlobalConfig stpGlobalConfig mst forward-time 4  Switch(config-controller-ProvisionStpPortType) # setStpGlobalConfig stpGlobalConfig mst instance 0 active enable  Switch(config-controller-ProvisionStpPortType) # setStpGlobalConfig stpGlobalConfig mst instance 0 priority 0  Switch(config-controller-ProvisionStpPortType) # setStpGlobalConfig stpGlobalConfig mst instance 0 vlan 1  Switch(config-controller-ProvisionStpPortType) # setStpGlobalConfig stpGlobalConfig mst max-age 30  Switch(config-controller-ProvisionStpPortType) # setStpGlobalConfig stpGlobalConfig mst max-hops 30  Switch(config-controller-ProvisionStpPortType) # setStpGlobalConfig stpGlobalConfig mst name ciscoNID123  Switch(config-controller-ProvisionStpPortType) # setStpGlobalConfig stpGlobalConfig mst revision 1111  Switch(config-controller-ProvisionStpPortType) # setStpGlobalConfig stpGlobalConfig port-number 1 enable  Switch(config-controller-ProvisionStpPortType) # setStpGlobalConfig stpGlobalConfig recovery interval 3000  Switch(config-controller-ProvisionStpPortType) # setStpGlobalConfig stpGlobalConfig transmit hold-count 10</pre>	<ul style="list-style-type: none"> <li>• <b>mode</b>—Configures the STP protocol mode. <ul style="list-style-type: none"> <li>◦ <b>mstp</b>—Enables or disables the Multiple Spanning Tree (802.1s).</li> <li>◦ <b>rstp</b>—Enables or disables the Rapid Spanning Tree (802.1w)</li> <li>◦ <b>stp</b>—Enables or disables the Spanning Tree (802.1D).</li> </ul> </li> <li>• <b>mst</b>—Configures the STP bridge instance. <ul style="list-style-type: none"> <li>◦ <i>Fwdtime</i>—Forward time. The range is from 4 to 30 seconds.</li> <li>◦ <i>instance</i>—Instance. The range is from 0 to 7 where CIST=0, MST2=1 and so on. <ul style="list-style-type: none"> <li>◦ <b>active</b>—Enables or disables the instance.</li> <li>◦ <i>Prio</i> —Specifies the priority. The range is from 0 to 61440 seconds. The range should be given in the sets of (0, 4096, 8192...) and so on.</li> <li>◦ <i>WORD</i>—VLAN range.</li> </ul> </li> <li>◦ <i>Maxage</i>—Maximum age. The range is from 6 to 40 seconds.</li> <li>◦ <i>Maxhops</i>—Maximum hops. The range is from 6 to 40 hop counts.</li> <li>◦ <i>Name</i>—Name of the bridge. You can use 32 characters to define.</li> <li>◦ <i>Revision</i>—Revision. The range is from 0-65535 revisions.</li> </ul> </li> <li>• <b>port-number</b>—Configures the port number in the range from 1 to 6. <ul style="list-style-type: none"> <li>◦ <i>Port number</i>—Port number. The range is from 1 to 6.</li> <li>◦ <b>disable</b>—Disables the port-number.</li> <li>◦ <b>enable</b>—Enables the port-number.</li> </ul> </li> <li>• <b>recovery</b>—Configures the error recovery timeout. <ul style="list-style-type: none"> <li>◦ <i>Interval</i>—Interval. The range is from 30-86400 seconds.</li> </ul> </li> </ul>
<p><b>Note</b> If the spanning-tree mode is STP or RSTP, and if the priority for the software needs to be changed, you can change using mst instance 0 and priority.</p>	

	Command or Action	Purpose
		<ul style="list-style-type: none"> <li>• <b>transmit</b>—Configures the BPDUs to transmit. <ul style="list-style-type: none"> <li>◦ <i>hold-count</i>—Maximum number of transmit BPDUs per second. The range is from 1 to 10 seconds.</li> </ul> </li> </ul>
<b>Step 5</b>	<b>setStpGlobalConfig review</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType) # setStpGlobalConfig review	Displays the configuration.
<b>Step 6</b>	<b>setStpGlobalConfig commit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType) # setStpGlobalConfig commit	Sends the configuration to the NID.
<b>Step 7</b>	<b>exit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType) # exit	Exits to the config-controller mode.

### Configuration Example

```

Switch# configure terminal
Switch(config)# controller nid 1/1
Switch(config-controller)# ProvisionStpPortType
Switch(config-controller-ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig edge
bpduguard enable
Switch(config-controller-ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mode
mstp enable
Switch(config-controller-ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst
forward-time 4
Switch(config-controller-ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst
instance 0 active enable
Switch(config-controller-ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst
instance 0 priority 0
Switch(config-controller-ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst
instance 0 vlan 1
Switch(config-controller-ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst
max-age 30
Switch(config-controller-ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst
max-hops 30
Switch(config-controller-ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst name
myNID123
Switch(config-controller-ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst
revision 1111
Switch(config-controller-ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig port-number
1 enable
Switch(config-controller-ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig recovery
interval 3000
Switch(config-controller-ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig transmit
hold-count 10
Switch(config-controller-ProvisionStpPortType)# setStpGlobalConfig review

```

Commands in queue:

```

setStpGlobalConfig stpGlobalConfig edge bpdu-guard enable
setStpGlobalConfig stpGlobalConfig mode mstp enable
setStpGlobalConfig stpGlobalConfig mst forward-time 4
setStpGlobalConfig stpGlobalConfig mst instance 0 active enable
setStpGlobalConfig stpGlobalConfig mst instance 0 priority 0
setStpGlobalConfig stpGlobalConfig mst instance 0 vlan 1
setStpGlobalConfig stpGlobalConfig mst max-age 30
setStpGlobalConfig stpGlobalConfig mst max-hops 30
setStpGlobalConfig stpGlobalConfig mst name myNID123
setStpGlobalConfig stpGlobalConfig mst revision 1111
setStpGlobalConfig stpGlobalConfig port-number 1 enable
setStpGlobalConfig stpGlobalConfig recovery interval 3000
setStpGlobalConfig stpGlobalConfig transmit hold-count 10

Switch(config-controller-ProvisionStpPortType)# setStpGlobalConfig commit

SetStpGlobalConfig Commit Success!!!

Switch(config-controller-ProvisionStpPortType)# exit

```

## Viewing Spanning-Tree Global Configurations

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>configure terminal</b>  <b>Example:</b> Switch# configure terminal	Enters global configuration mode.
Step 2	<b>controller nid /NID_ID</b>  <b>Example:</b> Switch(config)# controller nid 1/1	Enters the controller configuration mode.
Step 3	<b>ProvisionStpPortType</b>  <b>Example:</b> Switch (config-controller)# ProvisionStpPortType	Enters the ProvisionStpPortType mode.
Step 4	<b>getStpglobalConfig getStpGlobalConfigRequest</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# getStpglobalConfig getStpGlobalConfigRequest	Displays the configuration.
Step 5	<b>getStpglobalConfig commit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# getStpglobalConfig commit	Sends the configuration to the NID.
Step 6	<b>exit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# exit	Exits to the config-controller mode.

```
Switch# configure terminal
Switch(config)# controller nid 1/1
Switch(config-controller)# ProvisionStpPortType
Switch(config-controller-ProvisionStpPortType)# getStpglobalConfig getStpGlobalConfigRequest

    stpGlobalConfig.edge.bpdu_filter = false
    stpGlobalConfig.edge.bpdu_guard = true
    stpGlobalConfig.mode.t = 1
    stpGlobalConfig.mode.u.mstp = false
    stpGlobalConfig.mst.instance[0].active = true
    stpGlobalConfig.mst.instance[0].priority = 0
    stpGlobalConfig.mst.instance[0].vlan = '1'
    stpGlobalConfig.mst.forward_time = 4
    stpGlobalConfig.mst.max_age = 30
    stpGlobalConfig.mst.max_hops = 30
    stpGlobalConfig.mst.name = 'sandino123'
    stpGlobalConfig.mst.revision = 1111
    stpGlobalConfig.recovery.interval = 3000
    stpGlobalConfig.transmit.hold_count = 10
    stpGlobalConfig.port_number[0] = true
    stpGlobalConfig.port_number[1] = true
    stpGlobalConfig.port_number[2] = true
    stpGlobalConfig.port_number[3] = true
    stpGlobalConfig.port_number[4] = true
    stpGlobalConfig.port_number[5] = true

Switch(config-controller-ProvisionStpPortType)# getStpglobalConfig commit

    GetStpglobalConfig Commit Success!!!

Switch(config-controller-ProvisionStpPortType)# exit
```

## Configuring Spanning-Tree Port Configurations

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>configure terminal</b>  <b>Example:</b> Switch# configure terminal	Enters global configuration mode.
Step 2	<b>controller nid 1/NID_ID</b>  <b>Example:</b> Switch(config)# controller nid 1/1	Enters the controller configuration mode.
Step 3	<b>ProvisionStpPortType</b>  <b>Example:</b> Switch (config-controller)# ProvisionStpPortType	Enters the ProvisionStpPortType mode.
Step 4	<b>setStpportConfig stpPortConfig {auto-edge {enable   disable}  bpdu-guard {enable   disable}   edge {enable   disable}   link-type {auto  point-to   shared} {enable  </b>	Configures the spanning-tree port configuration.  • <b>stpPortConfig</b> —Sets the spanning-tree port configuration.

Command or Action	Purpose
<p><b>disable</b>   <b>mst instance</b> <i>instance-id</i> {<b>active</b> {<b>enable</b>   <b>disable</b>}   <b>cost</b> {<b>auto</b>   <b>cost-range</b> <i>cost_range</i>}   <b>port-priority</b> <i>port_priority</i>}   <b>port-number</b> <i>Port -number</i>   <b>restricted-role</b> {<b>enable</b>   <b>disable</b>}   <b>restricted-tcn</b> {<b>enable</b>   <b>disable</b>}}</p> <p><b>Example:</b></p> <pre>Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig auto-edge enable  Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig bpdu-guard disable  Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig edge disable  Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig link-type auto enable  Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig link-type point-to disable  Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig link-type shared disable  Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig mst instance 0 active enable  Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig mst instance 0 cost auto  Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig mst instance 0 cost cost-range 1  Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig mst instance 0 port-priority 1  Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig restricted-role enable  Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig restricted-tcn disable</pre>	<ul style="list-style-type: none"> <li>• <b>auto-edge</b>—Detects the auto-edge status. <ul style="list-style-type: none"> <li>◦ <b>enable</b>—Enables the auto-edge</li> <li>◦ <b>disable</b>—Disables the auto-edge</li> </ul> </li> <li>• <b>bpdu-guard</b>—Configures the BPDU guard. <ul style="list-style-type: none"> <li>◦ <b>enable</b>—Enables the bpdu-guard</li> <li>◦ <b>disable</b>—Disables the bpdu-guard</li> </ul> </li> <li>• <b>edge</b>—Configures the edge port. <ul style="list-style-type: none"> <li>◦ <b>enable</b>—Enables the edge.</li> <li>◦ <b>disable</b>—Disables the edge.</li> </ul> </li> <li>• <b>link-type</b>—Configures the port link-type. <ul style="list-style-type: none"> <li>◦ <b>auto</b>—Configures the link-type as auto. <ul style="list-style-type: none"> <li>◦ <b>enable</b>—Enables the link-type as auto.</li> <li>◦ <b>disable</b>—Disables the link-type as auto.</li> </ul> </li> <li>◦ <b>point-to</b>—Forces the link-type as point-to-point. <ul style="list-style-type: none"> <li>◦ <b>enable</b>—Enables the link-type as point-to.</li> <li>◦ <b>disable</b>—Disables the link-type as point-to.</li> </ul> </li> <li>◦ <b>shared</b>—Forces the link-type as shared. <ul style="list-style-type: none"> <li>◦ <b>enable</b>—Enables the link-type as shared.</li> <li>◦ <b>disable</b>—Disables the link-type as shared.</li> </ul> </li> </ul> </li> <li>• <b>mst</b>—Configures the STP bridge instance. <ul style="list-style-type: none"> <li>◦ <i>instance</i>—Instance. The range is from 0 to 7 where CIST=0, MST2=1 and so on.</li> <li>◦ <b>active</b>—Adds or removes an instance. <ul style="list-style-type: none"> <li>◦ <b>enable</b>—Enables the mst instance as active.</li> <li>◦ <b>disable</b>—Disables the mst instance as active.</li> </ul> </li> <li>◦ <b>cost</b>—Configures the STP cost for the port. <ul style="list-style-type: none"> <li>◦ <b>auto</b>—Uses auto cost.</li> </ul> </li> </ul> </li> </ul>



	Command or Action	Purpose
		<ul style="list-style-type: none"> <li>◦ <i>cost-range</i>—Cost range. The range is from 1-200000000.</li> <li>◦ <i>port-priority</i>—STP priority of the port. The range is from 0 to 240.</li> <li>• <b>port_number</b>—Configures the port number. <ul style="list-style-type: none"> <li>◦ <i>Port number</i>—Port number. The range is from 1 to 6.</li> </ul> </li> <li>• <b>restricted-role</b>—Configures the port role. It is restricted (and never a root port). <ul style="list-style-type: none"> <li>◦ <b>enable</b>—Enables the port as having restricted role.</li> <li>◦ <b>disable</b>—Disables the port as having restricted role.</li> </ul> </li> <li>• <b>restricted-tcn</b>—Restricts the topology change notifications. <ul style="list-style-type: none"> <li>◦ <b>enable</b>—Enables the restricted TCN.</li> <li>◦ <b>disable</b>—Disables the restricted TCN.</li> </ul> </li> </ul>
<b>Step 5</b>	<b>setstpPortConfig review</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType) # setstpPortConfig review	Displays the configuration.
<b>Step 6</b>	<b>setstpPortConfig commit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType) # setstpPortConfig commit	Sends the configuration to the NID.
<b>Step 7</b>	<b>exit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType) # exit	Exits to the config-controller mode.

### Configuration Example

```
Switch# configure terminal
Switch(config)# controller nid 1/1
Switch(config-controller) # ProvisionStpPortType
Switch(config-controller-ProvisionStpPortType) # setstpPortConfig stpPortConfig auto-edge
enable
```

```

Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig bpdu-guard
disable
Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig edge disable
Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig link-type
auto enable
Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig link-type
point-to disable
Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig link-type
shared disable
Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig mst instance
0 active enable
Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig mst instance
0 cost auto
Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig mst instance
0 cost cost-range 1
Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig mst instance
0 port-priority 1
Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig restricted-role
enable
Switch(config-controller-ProvisionStpPortType)# setstpPortConfig stpPortConfig restricted-tcn
disable
Switch(config-controller-ProvisionStpPortType)# setstpPortConfig review

```

Commands in queue:

```

setstpPortConfig stpPortConfig auto-edge enable
setstpPortConfig stpPortConfig bpdu-guard disable
setstpPortConfig stpPortConfig edge disable
setstpPortConfig stpPortConfig link-type auto enable
setstpPortConfig stpPortConfig link-type point-to disable
setstpPortConfig stpPortConfig link-type shared disable
setstpPortConfig stpPortConfig mst instance 0 active enable
setstpPortConfig stpPortConfig mst instance 0 cost auto
setstpPortConfig stpPortConfig mst instance 0 cost cost-range 1
setstpPortConfig stpPortConfig mst instance 0 port-priority 1
setstpPortConfig stpPortConfig restricted-role enable
setstpPortConfig stpPortConfig restricted-tcn disable

```

```
Switch(config-controller-ProvisionStpPortType)# setstpPortConfig commit
```

```
SetStpAggConfig Commit Success!!!
```

```
Switch(config-controller-ProvisionStpPortType)# exit
```

## Viewing Spanning-Tree Protocol Port Configurations

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Switch# configure terminal	Enters global configuration mode.
<b>Step 2</b>	<b>controller nid <i>1/NID_ID</i></b>  <b>Example:</b> Switch(config)# controller nid 1/1	Enters the controller configuration mode.

	Command or Action	Purpose
Step 3	<b>ProvisionStpPortType</b>  <b>Example:</b> Switch (config-controller)# ProvisionStpPortType	Enters the ProvisionStpPortType mode.
Step 4	<b>getStpportConfig getstpPortConfigRequest {port_number port_number}</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# getStpportConfig getstpPortConfigRequest port_number 1	Displays the configuration.  • <i>port_number</i> —Port number. The range is from 1 to 6.
Step 5	<b>getStpportConfig commit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# getStpportConfig commit	Sends the configuration to the NID.
Step 6	<b>exit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# exit	Exits to the config-controller mode.

```

Switch# configure terminal
Switch(config)# controller nid 1/1
Switch(config-controller)# ProvisionStpPortType
Switch(config-controller-ProvisionStpPortType)# getStpportConfig getstpPortConfigRequest
port_number 1

    stpPortConfig.port_number = 1
    stpPortConfig.auto_edge = false
    stpPortConfig.bpdu_guard = false
    stpPortConfig.edge = false
    stpPortConfig.link_type.t = 1
    stpPortConfig.link_type.u.auto_ = false
    stpPortConfig.restricted_role = false
    stpPortConfig.restricted_tcn = false

Switch(config-controller-ProvisionStpPortType)# getStpportConfig commit

    GetStpPortConfig Commit Success!!!

Switch(config-controller-ProvisionStpPortType)# exit

```

# Verifying Spanning-Tree Status

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>configure terminal</b>  <b>Example:</b> Switch# configure terminal	Enters global configuration mode.
Step 2	<b>controller nid <i>1/NID_ID</i></b>  <b>Example:</b> Switch(config)# controller nid 1/1	Enters the controller configuration mode.
Step 3	<b>ProvisionStpPortType</b>  <b>Example:</b> Switch (config-controller)# ProvisionStpPortType	Enters the ProvisionStpPortType mode.
Step 4	<b>showStpdetail showStpDetailRequest</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# showStpdetail showStpDetailRequest	Displays the STP status.
Step 5	<b>showStpdetail commit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# showStpdetail commit	Sends the configuration to the NID.
Step 6	<b>exit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# exit	Exits to the config-controller mode.

### Configuration Example

```
Switch# configure terminal
Switch(config)# controller nid 1/1
Switch(config-controller)# ProvisionStpPortType
Switch(config-controller-ProvisionStpPortType)# showStpdetail showStpDetailRequest
```

```
stpinfo.instance[0].instance_id = 0
stpinfo.instance[0].name = 'CIST'
stpinfo.instance[0].bridgeId = '32768.00-3A-99-FD-4B-1C'
stpinfo.instance[0].designatedRoot = '8192.00-14-1B-EC-1A-BF'
stpinfo.instance[0].rootport = '1'
stpinfo.instance[0].rootPathCost = 200022
stpinfo.instance[0].RegionalRoot = '32768.00-3A-99-FD-4B-1C'
stpinfo.instance[0].InternalPathCost = 0
stpinfo.instance[0].maxHops = 20
stpinfo.instance[0].topologyChange = 'Steady'
stpinfo.instance[0].topologyChangeCount = 31
```

```

stpinfo.instance[0].timeSinceTopologyChange = ' 0d 00:04:49'
stpinfo.instance[0].port_status[0].active = true
stpinfo.instance[0].port_status[0].name = 'CIST'
stpinfo.instance[0].port_status[0].port = '1'
stpinfo.instance[0].port_status[0].port_role = 'RootPort'
stpinfo.instance[0].port_status[0].state = 'Forwarding'
stpinfo.instance[0].port_status[0].priority = 128
stpinfo.instance[0].port_status[0].pathcost = 3392
stpinfo.instance[0].port_status[0].edge = false
stpinfo.instance[0].port_status[0].ptp = true
stpinfo.instance[0].port_status[0].uptime = ' 0d 00:05:10'

```

```
Switch(config-controller-ProvisionStpPortType)# showStpdetail commit
```

```
ShowStpDetail Commit Success!!!
```

```
Switch(config-controller-ProvisionStpPortType)# exit
```

## Verifying Spanning-Tree Summary

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Switch# configure terminal	Enters global configuration mode.
<b>Step 2</b>	<b>controller nid 1/NID_ID</b>  <b>Example:</b> Switch(config)# controller nid 1/1	Enters the controller configuration mode.
<b>Step 3</b>	<b>ProvisionStpPortType</b>  <b>Example:</b> Switch (config-controller)# ProvisionStpPortType	Enters the ProvisionStpPortType mode.
<b>Step 4</b>	<b>showStpsummary showstpSummaryRequest</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# showStpsummary showstpSummaryRequest	Displays the STP summary.
<b>Step 5</b>	<b>showStpdetail commit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# showStpsummary commit	Sends the configuration to the NID.
<b>Step 6</b>	<b>exit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# exit	Exits to the config-controller mode.

### Configuration Example

```

Switch# configure terminal
Switch(config)# controller nid 1/1
Switch(config-controller)# ProvisionStpPortType
Switch(config-controller-ProvisionStpPortType)# showStpdetail showStpDetailRequest

    StpSummaryinfo.Protocol = 'MSTP'
    StpSummaryinfo.MaxAge = 20
    StpSummaryinfo.ForwardDelay = 15
    StpSummaryinfo.txHoldCount = 6
    StpSummaryinfo.MaxHops = 20
    StpSummaryinfo.bpduFiltering = false
    StpSummaryinfo.bpduGuard = false
    StpSummaryinfo.errRecoveryDelay = 0
    StpSummaryinfo.mstp_bridge[0].instance_id = 0
    StpSummaryinfo.mstp_bridge[0].name = 'CIST'
    StpSummaryinfo.mstp_bridge[0].status = true
    StpSummaryinfo.mstp_bridge[1].instance_id = 1
    StpSummaryinfo.mstp_bridge[1].name = 'MSTI1'
    StpSummaryinfo.mstp_bridge[1].status = false
    StpSummaryinfo.mstp_bridge[2].instance_id = 2
    StpSummaryinfo.mstp_bridge[2].name = 'MSTI2'
    StpSummaryinfo.mstp_bridge[2].status = false
    StpSummaryinfo.mstp_bridge[3].instance_id = 3
    StpSummaryinfo.mstp_bridge[3].name = 'MSTI3'
    StpSummaryinfo.mstp_bridge[3].status = false
    StpSummaryinfo.mstp_bridge[4].instance_id = 4
    StpSummaryinfo.mstp_bridge[4].name = 'MSTI4'
    StpSummaryinfo.mstp_bridge[4].status = false
    StpSummaryinfo.mstp_bridge[5].instance_id = 5
    StpSummaryinfo.mstp_bridge[5].name = 'MSTI5'
    StpSummaryinfo.mstp_bridge[5].status = false
    StpSummaryinfo.mstp_bridge[6].instance_id = 6
    StpSummaryinfo.mstp_bridge[6].name = 'MSTI6'
    StpSummaryinfo.mstp_bridge[6].status = false
    StpSummaryinfo.mstp_bridge[7].instance_id = 7
    StpSummaryinfo.mstp_bridge[7].name = 'MSTI7'
    StpSummaryinfo.mstp_bridge[7].status = false
    StpSummaryinfo.portcounters[0].port_number = 0
    StpSummaryinfo.portcounters[0].rxMstp = 0
    StpSummaryinfo.portcounters[0].txMstp = 4
    StpSummaryinfo.portcounters[0].rxRstp = 0
    StpSummaryinfo.portcounters[0].txRstp = 0
    StpSummaryinfo.portcounters[0].rxstp = 144
    StpSummaryinfo.portcounters[0].txstp = 122790
    StpSummaryinfo.portcounters[0].rxtcn = 29
    StpSummaryinfo.portcounters[0].txtcn = 2
    StpSummaryinfo.portcounters[0].rxIllegalFrames = 0
    StpSummaryinfo.portcounters[0].unknownFrames = 0

Switch(config-controller-ProvisionStpPortType)# showStpsummary commit

    ShowStpSummary Commit Success!!!

Switch(config-controller-ProvisionStpPortType)# exit

```

## Clearing Spanning-Tree Statistics

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>configure terminal</b>  <b>Example:</b> Switch# configure terminal	Enters global configuration mode.
Step 2	<b>controller nid 1/NID_ID</b>  <b>Example:</b> Switch(config)# controller nid 1/1	Enters the controller configuration mode.
Step 3	<b>ProvisionStpPortType</b>  <b>Example:</b> Switch (config-controller)# ProvisionStpPortType	Enters the ProvisionStpPortType mode.
Step 4	<b>clearStpstatistics stpPortSelect {all   port {port-number}}</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# clearStpstatistics stpPortSelect port-number 1	Clears the spanning-tree statistics. <ul style="list-style-type: none"> <li>• <b>all</b>—Clears the statistics from all the ports.</li> <li>• <b>port</b>—Clears the statistics from a specified port number.               <ul style="list-style-type: none"> <li>◦ <i>port-number</i>—Port number. The range is from 1 to 6.</li> </ul> </li> </ul>
Step 5	<b>ClearStpStatistics review</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# ClearStpStatistics review	Displays the configuration.
Step 6	<b>ClearStpStatistics Commit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# ClearStpStatistics Commit	Sends the configuration to the NID.
Step 7	<b>exit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# exit	Exits to the config-controller mode.

#### Configuration Example

```
Switch# configure terminal
Switch(config)# controller nid 1/1
```

```

Switch(config-controller)# ProvisionStpPortType
Switch(config-controller-ProvisionStpPortType)# clearStpstatistics stpPortSelect port-number
1
Switch(config-controller-ProvisionStpPortType)# ClearStpStatistics Review

Commands in queue:
    clearStpstatistics stpPortSelect port-number 1

Switch(config-controller-ProvisionStpPortType)# ClearStpStatistics Commit

    ClearStpStatistics Commit Success!!!

Switch(config-controller-ProvisionStpPortType)# exit

```

## Clearing Spanning-Tree Detected Protocols

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Switch# configure terminal	Enters global configuration mode.
<b>Step 2</b>	<b>controller nid <i>1/NID_ID</i></b>  <b>Example:</b> Switch(config)# controller nid 1/1	Enters the controller configuration mode.
<b>Step 3</b>	<b>ProvisionStpPortType</b>  <b>Example:</b> Switch (config-controller)# ProvisionStpPortType	Enters the ProvisionStpPortType mode.
<b>Step 4</b>	<b>clearStpdetected stpPortSelect {all   port {<i>port-number</i>}}</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# clearStpdetected stpPortSelect port-number 1	Clear spanning-tree detected-protocols. <ul style="list-style-type: none"> <li>• <b>all</b>—Clears from all the ports.</li> <li>• <b>port</b>—Clears from a specified port number. <ul style="list-style-type: none"> <li>◦ <i>port-number</i>—Port number. The range is from 1 to 6.</li> </ul> </li> </ul>
<b>Step 5</b>	<b>clearStpdetected review</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# clearStpdetected review	Displays the configuration.
<b>Step 6</b>	<b>clearStpdetected commit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# clearStpdetected commit	Sends the configuration to the NID.



	Command or Action	Purpose
<b>Step 7</b>	<b>exit</b>  <b>Example:</b> Switch(config-controller-ProvisionStpPortType)# exit	Exits to the config-controller mode.

### Configuration Example

```
Switch# configure terminal
Switch(config)# controller nid 1/1
Switch(config-controller)# ProvisionStpPortType
Switch(config-controller-ProvisionStpPortType)# clearStpdetected stpPortSelect port-number
1
Switch(config-controller-ProvisionStpPortType)# clearStpdetected review
Commands in queue:
  clearStpdetected stpPortSelect port-number 1

Switch(config-controller-ProvisionStpPortType)# clearStpdetected commit

  clearStpdetected Commit Success!!!

Switch(config-controller-ProvisionStpPortType)# exit
```

