

IOS STP Enhancement

Feature Summary

The IOS Spanning Tree Extension broadens the original implementation with increased port identification capability, improved path cost determination, and support for a new VLAN bridge spanning-tree protocol.

Benefits

The IOS STP Enhancement provides the following benefits:

- More than one byte on a port number to distinguish interfaces.
- An improved way to form the Port ID.
- An improved way to calculate the correct port path cost.

Restrictions

Port Number size of the Port ID support is applied only to IEEE and Vlan-Bridge Spanning Tree protocols. The DEC protocol only has 8 bits on the port id, so the extension of the Port ID cannot be applied.

The expansion of the Port Number field into the port priority portion of the Port ID changes the useful values the port priority can be assigned. This expansion is an extension of the 802.1D Spanning Tree Protocol.

The way to calculate the Port Path Cost is only support in IEEE and vlan-bridge Spanning Tree environment.

Vlan-bridge Spanning Tree protocol in this phase will support following medias - ethernet, fast ethernet, FDDI, ATM, serial (hdlc, ppp, frame-relay, frame-relay ietf, smds, x.25). Other medias will be added in future releases.

Platforms

This feature is supported on these platforms:

- Cisco 1003 and 1004 ISDN Router
- Cisco 1600 Modular Access Router
- Cisco 2500 Series Dual Lan Routers

- Cisco 3600 Series Modular Dial Access Servers
- Cisco 7200 Series Routers
- Cisco 7600 Series Routers

Supported MIBs and RFCs

None.

Configuration Tasks

There are no new configuration tasks.

Configuration Examples

The following example shows the help interface for using the **bridge-group priority** command:

```
Router(config)# bridge 1 protocol ieee
Router(config)# int e0
Router(config-if)#bridge-group 1
Router(config-if)# bridge-group 1 priority ?
    <0-255> increments of 2 for IEEE or vlan-bridge, others 1

Router(config-if)# bridge-group 1 priority 1
Priority in increments of 2 is required

Router(config-if)# bridge-group 1 priority 3
Priority in increments of 2 is required

Router(config-if)# bridge-group 1 priority 2
Router(config-if)#
```

Command Reference

This section documents new or modified commands. All other commands used with this feature are documented in the Cisco IOS Release 12.0 command references.>>

- bridge-group priority
- bridge protocol
- show spanning-tree

bridge-group priority

Use the **bridge-group priority** interface configuration command to set an interface priority. The interface priority is used to select the designated port for this bridge-group on the connected media. One designated port on each media is needed to compute the spanning tree.

bridge-group *bridge-group* **priority** *number*

Syntax Description

<i>bridge-group</i>	Number of the bridge group to which the interface belongs. It must be a number in the range 1 to 63.
<i>number</i>	Priority number ranging from 0 to 255.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

The lower the number, the more likely it is that the bridge on the interface will be chosen as the root.

Examples

The following example shows the **bridge-group priority** help information for 9-bit port number size:

```
Router(config-if)# bridge-group 1 priority ?  
<0-255> increments of 2 for IEEE or vlan-bridge, others 1
```

The following example shows the **bridge-group priority** help information for 10-bit port number size:

```
Router(config-if)# bridge-group 1 priority ?  
<0-255> increments of 4 for IEEE or vlan-bridge, others 1
```

Related Commands

bridge-group
bridge priority

bridge protocol

Use the **bridge protocol** global configuration command to define the type of Spanning-Tree Protocol. Use the **no** form of this command with the appropriate keywords and arguments to delete the bridge group.

```
bridge bridge-group protocol { ieee | dec | vlan-bridge }
no bridge bridge-group protocol { ieee | dec | vlan-bridge }
```

Syntax Description

<i>bridge-group</i>	Number in the range 1 to 63 that you choose to refer to a particular set of bridged interfaces. Frames are bridged only among interfaces in the same group. You will use the group number you assign in subsequent bridge configuration commands.
ieee	IEEE Ethernet Spanning-Tree Protocol.
dec	Digital Spanning-Tree Protocol.
vlan-bridge	VLAN-Bridge Spanning-Tree Protocol.

Default

No Spanning-Tree Protocol is defined.

Command Mode

Global configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

The routers support two Spanning-Tree Protocols: the IEEE 802.1 standard and the earlier Digital Spanning-Tree Protocol upon which the IEEE standard is based. Multiple domains are supported for the IEEE 802.1 Spanning-Tree Protocol.

Note The IEEE 802.1D Spanning-Tree Protocol is the preferred way of running the bridge. Use the Digital Spanning-Tree Protocol only for backward compatibility.

Example

The following example shows bridge 1 as using the VLAN Bridge Spanning Tree Protocol:

```
bridge 1 protocol vlan-bridge
```

Related Commands

```
bridge domain
bridge-group
```

show spanning-tree

To display information regarding which spanning-tree protocol is running, use the **show spanning-tree** configuration command.

```
show spanning tree bridge-group
```

Syntax Description

bridge-group Bridge group number, in the range of 1 to 256, specified in the **bridge protocol** command.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 12.0(1)T

Example

The following example shows that Bridge group 1 is running the VLAN Bridge Spanning Tree protocol.

```
Router# sh spanning-tree 1

Bridge group 1 is executing the VLAN Bridge compatible Spanning Tree protocol
Bridge Identifier has priority 32768, address 0000.0c37.b055
Configured hello time 2, max age 30, forward delay 20
We are the root of the spanning tree
Port Number size is 10 bits
Topology change flag not set, detected flag not set
Times: hold 1, topology change 35, notification 2
      hello 2, max age 30, forward delay 20
Timers: hello 0, topology change 0, notification 0
      bridge aging time 300

Port 8 (Ethernet1) of Bridge group 1 is forwarding
Port path cost 100, Port priority 128
Designated root has priority 32768, address 0000.0c37.b055
Designated bridge has priority 32768, address 0000.0c37.b055
Designated port is 8, path cost 0
Timers: message age 0, forward delay 0, hold 0
BPDU: sent 184, received 0
```

