

Spanning Tree Protocol (STP) Configuration on Sx500 Series Stackable Switches

Objective

Spanning Tree Protocol (STP) protects Layer 2 broadcast domains from broadcast storms. It sets the links to standby mode to prevent loops. Loops occur when alternate routes exist between hosts. These loops in an extended network can cause Layer 2 switches to forward traffic an infinite amount of times, which results in an increased traffic load and lower network efficiency. STP provides a tree topology for any arrangement of Layer 2 switches and links by creating a unique path between end stations on a network. These individual paths eliminate the possibility of loops.

The user in a real time scenario can configure STP to prevent loops and thereby prevent a lot of traffic flow back and forth in the network.

This document explains how to configure STP on Sx500 Series Stackable Switches.

Applicable Devices

- Sx500 Series Stackable Switches

Software Version

- 1.3.0.62

Spanning Tree Protocol Configuration

Step 1. Log in to the web configuration utility and choose **Spanning Tree > STP Status & Global Settings**. The *STP Status & Global Settings* page opens:

STP Status & Global Settings

Global Settings

- Spanning Tree State: ☒ Enable
- STP Operation Mode: ☐ Classic STP
☒ Rapid STP
☐ Multiple STP
- BPDU Handling: ☐ Filtering
☒ Flooding
- Path Cost Default Values: ☐ Short
☒ Long

Bridge Settings

- ✱ Priority: 32768
- ✱ Hello Time: 2
- ✱ Max Age: 20
- ✱ Forward Delay: 15

Designated Root

- Bridge ID: 32768-e0:5f:b9:b2:90:7
- Root Bridge ID: 32768-e0:5f:b9:b2:90:7
- Root Port: 0

Global Settings Configuration

Global Settings

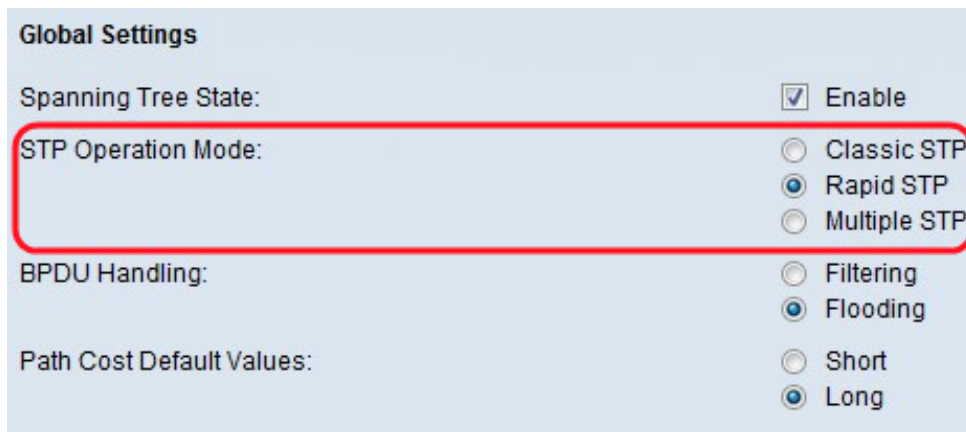
Spanning Tree State: ☒ Enable

STP Operation Mode: ☐ Classic STP
☒ Rapid STP
☐ Multiple STP

BPDU Handling: ☐ Filtering
☒ Flooding

Path Cost Default Values: ☐ Short
☒ Long

Step 1. Check **Enable** in the Spanning Tree State field to enable spanning tree.

A screenshot of a network configuration interface titled "Global Settings". It contains four settings: "Spanning Tree State" with a checked "Enable" checkbox; "STP Operation Mode" with three radio buttons: "Classic STP", "Rapid STP" (which is selected and highlighted with a red rectangle), and "Multiple STP"; "BPDU Handling" with two radio buttons: "Filtering" and "Flooding" (which is selected); and "Path Cost Default Values" with two radio buttons: "Short" and "Long" (which is selected).

Global Settings

Spanning Tree State: ☒ Enable

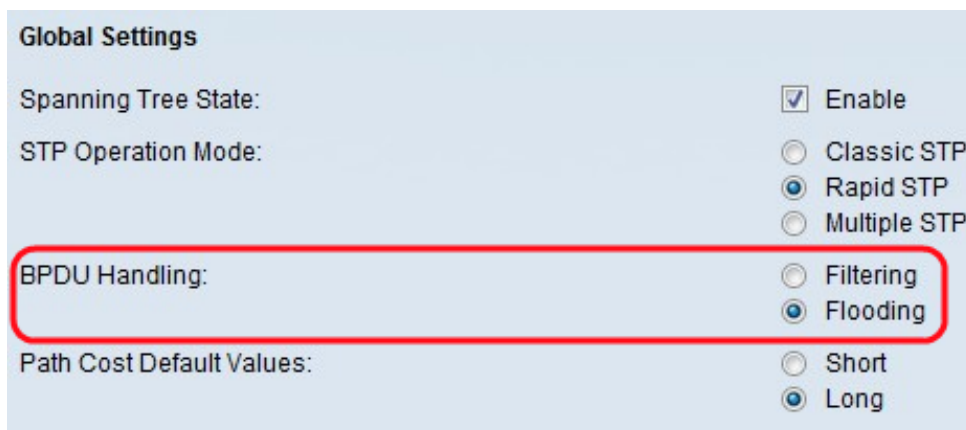
STP Operation Mode: ☐ Classic STP ☒ Rapid STP ☐ Multiple STP

BPDU Handling: ☐ Filtering ☒ Flooding

Path Cost Default Values: ☐ Short ☒ Long

Step 2. Click the radio button that corresponds to the desired operating mode for STP in the STP Operation Mode field.

- Classic STP — Provides a single path between any two end stations which avoids and eliminates loops.
- Rapid STP — Detects network topologies to provide faster convergence of the spanning tree. This is most effective when the network topology is naturally tree-structured, and therefore faster convergence might be possible.
- Multiple STP — Detects Layer 2 loops and attempts to mitigate them by preventing the involved port from transmitting traffic. MSTP enables several STP instances so that it is possible to detect and mitigate loops separately in each instance. MSTP provides full connectivity for packets allocated to any VLAN. In addition, MSTP transmits packets assigned to various VLANs through different multiple spanning tree (MST) regions.

A screenshot of the same "Global Settings" interface. In this view, the "BPDU Handling" section is highlighted with a red rectangle, showing the "Flooding" radio button selected. The other settings remain the same as in the previous screenshot.

Global Settings

Spanning Tree State: ☒ Enable

STP Operation Mode: ☐ Classic STP ☒ Rapid STP ☐ Multiple STP

BPDU Handling: ☐ Filtering ☒ Flooding

Path Cost Default Values: ☐ Short ☒ Long

Step 3. Click the desired radio button in the Bridge Protocol Data Unit (BPDU) Handling field. BPDU is used to transmit spanning tree information when STP is disabled on the port or the switch.

- Filtering — Filters BPDU packets when spanning tree is disabled on an interface. Only a few BPDU packets are exchanged among the switches.
- Flooding — Floods BPDU packets when spanning tree is disabled on an interface. All the BPDU packets are exchanged among all the switches.

Global Settings

Spanning Tree State: ☒ Enable

STP Operation Mode: ☐ Classic STP ☒ Rapid STP ☐ Multiple STP

BPDU Handling: ☐ Filtering ☒ Flooding

Path Cost Default Values: ☐ Short ☒ Long

Step 4. Click the desired radio button in the Path Cost Default Values field. It is used to assign default path costs to the STP ports. Path cost is the distance (cost) from a specific port to the root port.

- Short — Specifies the range 1 through 65,535 for port path costs.
- Long — Specifies the range 1 through 200,000,000 for port path costs.

Step 5. Click **Apply**.

Bridge Settings Configuration

Bridge Settings

✱ Priority: 4096 (Range: 0 - 61440, Default: 32768)

✱ Hello Time: 4 sec. (Range: 1 - 10, Default: 2)

✱ Max Age: 15 sec. (Range: 6 - 40, Default: 20)

✱ Forward Delay: 25 sec. (Range: 4 - 30, Default: 15)

Step 1. Enter the priority value in the Priority field. After the exchange of BPDUs, the device with the lowest priority becomes the Root Bridge. A Root Bridge is the bridge that becomes the active bridge of the network and is in charge of all the other decisions such as which port needs to be blocked and which port needs to be in the forward mode. In the case that all bridges use the same priority, then their MAC addresses are used to determine which one is the Root Bridge. The bridge priority value is provided in increments of 4096.

If you are unfamiliar with the terms used, check out [Cisco Business: Glossary of New Terms](#).

Note: After exchanging BPDUs, the device with the lowest priority becomes the Root Bridge. If all bridges use the same priority, their MAC addresses are used to determine which one is the root bridge. The bridge with lowest MAC address becomes the Root Bridge then.

Bridge Settings

✱ Priority: 4096 (Range: 0 - 61440, Default: 32768)

✱ Hello Time: 4 sec. (Range: 1 - 10, Default: 2)

✱ Max Age: 15 sec. (Range: 6 - 40, Default: 20)

✱ Forward Delay: 25 sec. (Range: 4 - 30, Default: 15)

Step 2. Enter the interval (in seconds) that a Root Bridge waits between configuration messages in the Hello Time field. The range is 1 to 10 seconds.

Bridge Settings		
Priority:	4096	(Range: 0 - 61440, Default: 32768)
Hello Time:	4	sec. (Range: 1 - 10, Default: 2)
Max Age:	15	sec. (Range: 6 - 40, Default: 20)
Forward Delay:	25	sec. (Range: 4 - 30, Default: 15)

Step 3. Enter the interval (in seconds) that the switch can wait without receiving a configuration message before it attempts to redefine its own configuration in the Max Age field.

Bridge Settings		
Priority:	4096	(Range: 0 - 61440, Default: 32768)
Hello Time:	4	sec. (Range: 1 - 10, Default: 2)
Max Age:	15	sec. (Range: 6 - 40, Default: 20)
Forward Delay:	25	sec. (Range: 4 - 30, Default: 15)

Step 4. Enter the interval (in seconds) that a bridge remains in a learning state before it forwards packets in the Forward Delay field. Forward delay timer is the amount of time a port stays in the listening state before moving to a learning state or the amount of time a port stays in the learning state before moving to the listening state.

Designated Root	
Bridge ID:	32768-e0:5f:b9:b2:90:75
Root Bridge ID:	32768-e0:5f:b9:b2:90:75
Root Port:	0
Root Path Cost:	0
Topology Changes Counts:	2
Last Topology Change:	0D/22H/12M/8S

The Designated Root area displays the following information:

- Bridge ID — The bridge priority concatenated with the MAC address of the switch.
- Root Bridge ID — The Root Bridge priority concatenated with the MAC address of the switch.
- Root Port — The port that has the lowest cost path from this bridge to the Root Bridge.
- Root Path Cost — The cost of the path from this bridge to the root.
- Topology Changes Count — The total number of STP topology changes that have occurred.
- Last Topology Change — The time interval that has elapsed since the last topology change occurred. The time is displayed in days/hours/minutes/seconds format.

Step 5. Click **Apply**.