

Configuring STP Status & Global Settings on the SG350XG and SG550XG

Objective

A bridging loop or spanning tree loop can cause a network outage because packet sent on the network can loop forever, slowing down the network. Spanning-Tree Protocol (STP) prevents loops from being formed when switches or bridges are interconnected via multiple paths. Spanning-Tree Protocol implements the 802.1D IEEE algorithm by exchanging Bridge Protocol Data Unit (BPDU) messages with other switches to detect loops and then removes the loop by shutting down selected bridge interfaces. This algorithm guarantees that there is one and only one active path between two network devices. The SG350XG and the SG550XG offers Classic STP, Rapid STP (RSTP), and Multiple STP (MSTP).

The objective of this document is to show you how to configure STP Status and Global Settings on the SG350XG and SG550XG.

Note: The steps in this document are performed under the Advanced Display Mode. To change to the Advance Display Mode, go to the top right corner and select **Advanced** in the *Display Mode* drop-down list.

Applicable Devices

- SG350XG
- SG550XG

Software Version

- SG350XG – v2.0.0.73
- SG550XG – v2.0.0.73

Configuring Global Settings

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 Loopback Guard: Enable
- STP Operation Mode: Classic STP
 Rapid STP
 Multiple STP
- BPDU Handling: Filtering
 Flooding
- Path Cost Default Values: Short
 Long

Bridge Settings

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

Designated Root

- Bridge ID:
- Root Bridge ID:
- Root Port: 0
- Root Path Cost: 0
- Topology Changes Counts: 0
- Last Topology Change: 0D/0H/5M/27S

Step 2. In the *Spanning Tree State* field, check the **Enable** box to enable STP. It is checked by default.

Global Settings

Spanning Tree State: Enable

STP Loopback Guard: Enable

STP Operation Mode: Classic STP
 Rapid STP
 Multiple STP

BPDU Handling: Filtering
 Flooding

Path Cost Default Values: Short
 Long

Step 3. STP Loopback Guard provides additional protection against Layer 2 forwarding loops. A loop is created when an STP blocking port in a redundant topology incorrectly transitions to the forwarding state. This usually happens because one of the ports of a physically redundant topology (not necessarily the STP blocking port) no longer receives STP BPDUs. If you want to enable *STP Loopback Guard*, check the **Enable** box to enable STP Loopback Guard.

Global Settings

Spanning Tree State: Enable

STP Loopback Guard: Enable

STP Operation Mode: Classic STP
 Rapid STP
 Multiple STP

BPDU Handling: Filtering
 Flooding

Path Cost Default Values: Short
 Long

Step 4. Select the *STP Operation Mode* that you desire to use.

Global Settings

Spanning Tree State:	<input checked="" type="checkbox"/> Enable
STP Loopback Guard:	<input checked="" type="checkbox"/> Enable
STP Operation Mode:	<input type="radio"/> Classic STP <input checked="" type="radio"/> Rapid STP <input type="radio"/> Multiple STP
BPDU Handling:	<input type="radio"/> Filtering <input checked="" type="radio"/> Flooding
Path Cost Default Values:	<input type="radio"/> Short <input checked="" type="radio"/> Long

The available options are:

- Classic STP – STP is a link layer network protocol that ensures a loop-free topology for any bridged LAN. The basic function of STP is to prevent bridge loops and to ensure broadcast radiation.
- Rapid STP – Rapid Spanning Tree Protocol (RSTP) is a layer 2 network protocol used to obtain a loop free topology. RSTP is an enhanced version of Spanning Tree Protocol (STP) that provides faster convergence to obtain a loop free topology.
- Multiple STP – Multiple STP is based on Rapid STP. It detects Layer 2 loops and attempts to mitigate them by preventing the involved port from transmitting traffic. Since loops exist on a per-Layer 2-domain basis, a situation can occur when a port is blocked to eliminate a STP loop. Traffic will be forwarded to the port that is not blocked and no traffic will be forwarded to the port that is blocked. This is not an efficient usage of bandwidth as the blocked port will always be unused.

Step 5. In the *BPDU Handling* field, select the desired radio button. BPDU Handling is how Bridge Protocol Data Unit (BPDU) packets are managed when STP is disabled on the port or the device. BPDUs are used to transmit spanning tree information. This field is only available if you did not enable Spanning Tree State in [Step 2](#).

Global Settings

Spanning Tree State:	<input type="checkbox"/>	Enable
STP Loopback Guard:	<input checked="" type="checkbox"/>	Enable
STP Operation Mode:	<input type="radio"/>	Classic STP
	<input checked="" type="radio"/>	Rapid STP
	<input type="radio"/>	Multiple STP
BPDU Handling:	<input type="radio"/>	Filtering
	<input checked="" type="radio"/>	Flooding
Path Cost Default Values:	<input type="radio"/>	Short
	<input checked="" type="radio"/>	Long

The available options are:

- Filtering – Filters BPDU packets when Spanning Tree is disabled on an interface.
- Flooding – Floods BPDU packets when Spanning Tree is disabled on an interface.

Step 6. In the *Path Cost Default Values* field, select the desired method that you want to use to assign default path costs to the STP ports. The default path cost assigned to an interface varies according to the selected method.

Global Settings

Spanning Tree State:	<input checked="" type="checkbox"/> Enable
STP Loopback Guard:	<input checked="" type="checkbox"/> Enable
STP Operation Mode:	<input type="radio"/> Classic STP <input checked="" type="radio"/> Rapid STP <input type="radio"/> Multiple STP
BPDU Handling:	<input type="radio"/> Filtering <input checked="" type="radio"/> Flooding
Path Cost Default Values:	<input type="radio"/> Short <input checked="" type="radio"/> Long

The available options are:

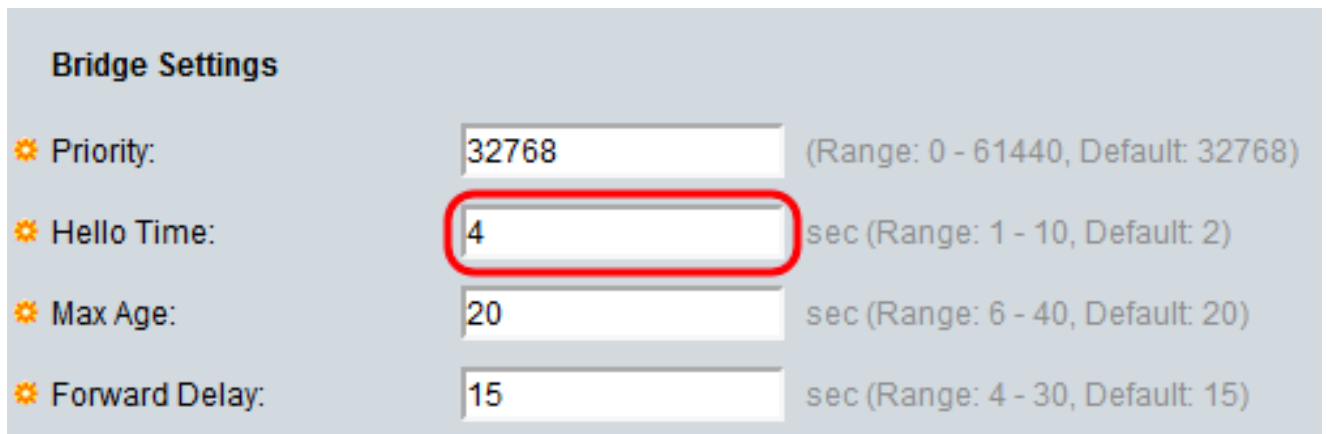
- Short – Specifies the range 1 through 65,535 for port path costs.
- Long – Specifies the range 1 through 200,000,000 for port path costs.

Configuring Bridge Settings

Step 1. The priority sets the bridge priority value. After exchanging BPDUs, the device with the lowest priority becomes the Root Bridge. In the case that all bridges use the same priority, then their MAC addresses are used to determine the Root Bridge. The bridge priority value is provided in increments of 4096. For example, 4096, 8192, 12288, and so on. In the *Priority* field, enter in the value from 0 – 61440. The default value is 32768.

Bridge Settings	
✱ Priority:	<input type="text" value="32768"/> (Range: 0 - 61440, Default: 32768)
✱ Hello Time:	<input type="text" value="2"/> sec (Range: 1 - 10, Default: 2)
✱ Max Age:	<input type="text" value="20"/> sec (Range: 6 - 40, Default: 20)
✱ Forward Delay:	<input type="text" value="15"/> sec (Range: 4 - 30, Default: 15)

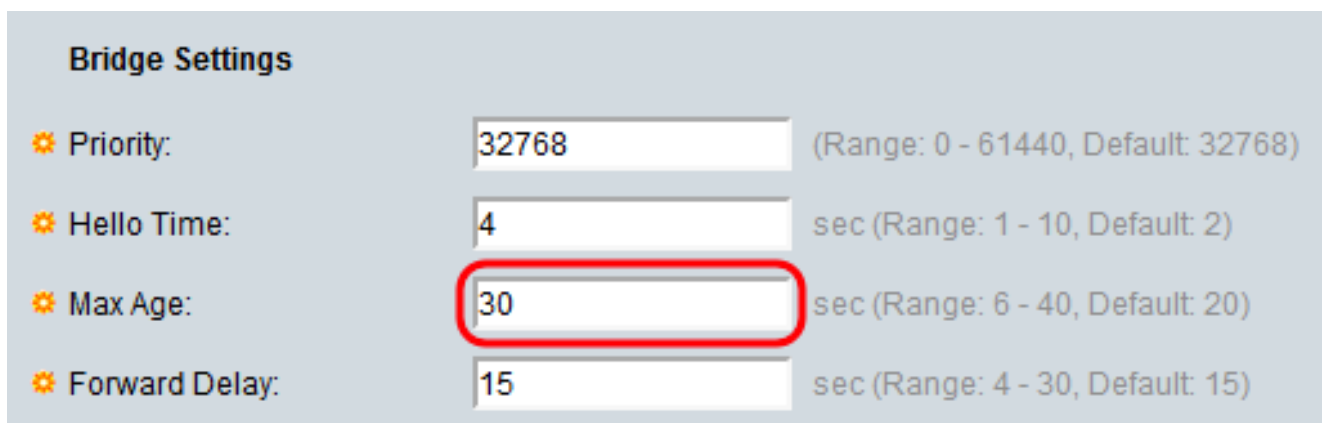
Step 2. In the *Hello Time* field, set the interval (in seconds) that a Root Bridge waits between configuration messages. This ranges from 1-10 and the default value is 2.



Bridge Settings

Priority:	<input type="text" value="32768"/>	(Range: 0 - 61440, Default: 32768)
Hello Time:	<input type="text" value="4"/>	sec (Range: 1 - 10, Default: 2)
Max Age:	<input type="text" value="20"/>	sec (Range: 6 - 40, Default: 20)
Forward Delay:	<input type="text" value="15"/>	sec (Range: 4 - 30, Default: 15)

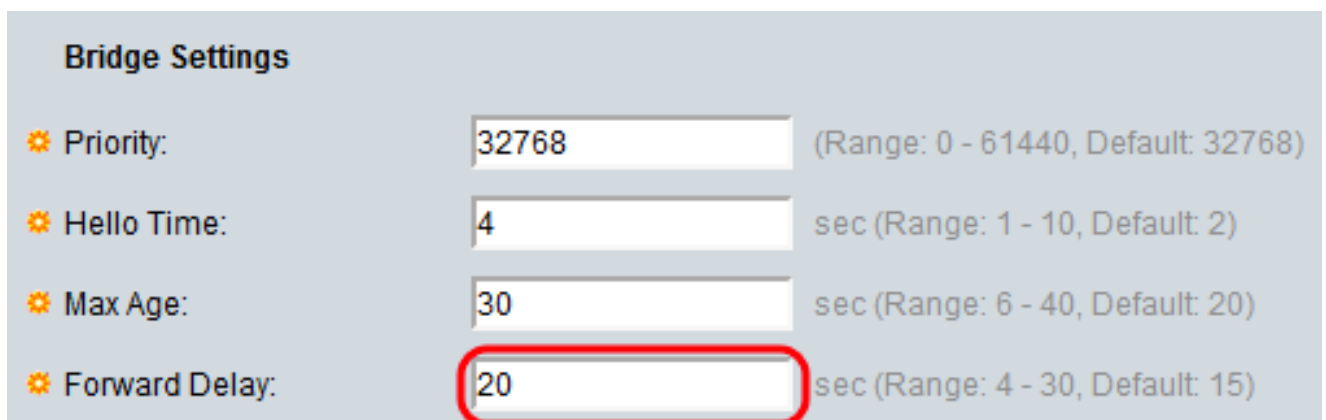
Step 3. Set the interval (in seconds) in the *Max Age* field. This tells how long the device can wait without receiving a configuration message before attempting to redefine its own configuration. The range is from 6 – 40 and the default value is 20.



Bridge Settings

Priority:	<input type="text" value="32768"/>	(Range: 0 - 61440, Default: 32768)
Hello Time:	<input type="text" value="4"/>	sec (Range: 1 - 10, Default: 2)
Max Age:	<input type="text" value="30"/>	sec (Range: 6 - 40, Default: 20)
Forward Delay:	<input type="text" value="15"/>	sec (Range: 4 - 30, Default: 15)

Step 4. In the *Forward Delay* field, set the interval (in seconds) that a bridge remains in a learning state before forwarding packets. This ranges from 4 – 30 and the default value is 15.



Bridge Settings

Priority:	<input type="text" value="32768"/>	(Range: 0 - 61440, Default: 32768)
Hello Time:	<input type="text" value="4"/>	sec (Range: 1 - 10, Default: 2)
Max Age:	<input type="text" value="30"/>	sec (Range: 6 - 40, Default: 20)
Forward Delay:	<input type="text" value="20"/>	sec (Range: 4 - 30, Default: 15)

Note: For more information, refer to [Configuring STP Interface Settings on the SG350XG and](#)

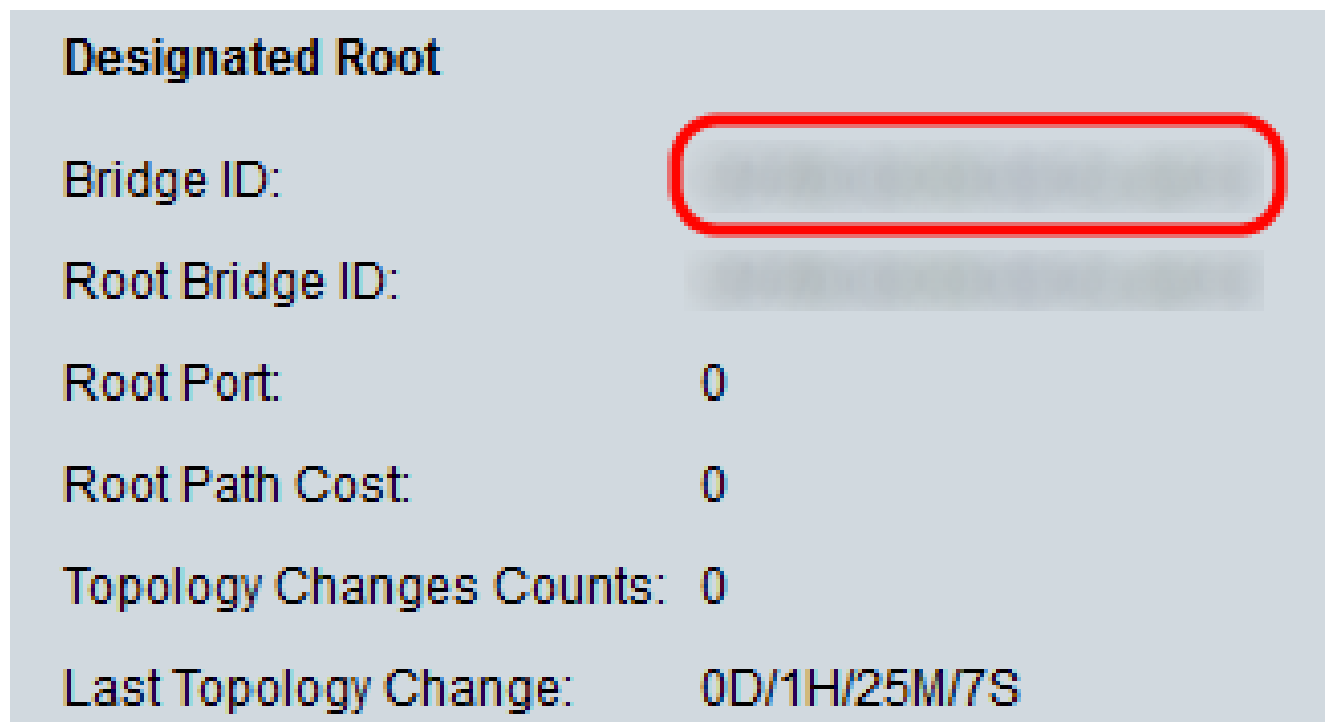
[SG550XG](#).

Step 5. Click **Apply**. The STP Global settings are written to the Running Configuration file.

Designated Root

A designated root is when you force a specific device to be the root device in an STP (Spanning Tree Protocol) domain instead of having the devices figure it out on their own. This section of the document shows the details on the designated root.

The *Bridge ID* field shows the bridge priority concatenated with the MAC address of the device.



Designated Root

Bridge ID:	<input type="text" value="24016000000000000000"/>
Root Bridge ID:	00000000000000000000
Root Port:	0
Root Path Cost:	0
Topology Changes Counts:	0
Last Topology Change:	0D/1H/25M/7S

The *Root Bridge ID* field shows the Root Bridge priority concatenated with the MAC address of the Root Bridge.

Designated Root

Bridge ID:

Root Bridge ID:

Root Port: 0

Root Path Cost: 0

Topology Changes Counts: 0

Last Topology Change: 0D/1H/25M/7S

The *Root Port* field is the port that offers the lowest cost path from this bridge to the Root Bridge.

Note: This is significant when the bridge is not the root.

Designated Root

Bridge ID:

Root Bridge ID:

Root Port: 0

Root Path Cost: 0

Topology Changes Counts: 0

Last Topology Change: 0D/1H/25M/7S

The *Root Path Cost* field is the cost of the path from this bridge to the root.

Designated Root

Bridge ID:

Root Bridge ID:

Root Port: 0

Root Path Cost: 0

Topology Changes Counts: 0

Last Topology Change: 0D/1H/25M/7S

The *Topology Changes Counts* field is the total number of STP topology changes that have occurred.

Designated Root

Bridge ID:

Root Bridge ID:

Root Port: 0

Root Path Cost: 0

Topology Changes Counts: 0

Last Topology Change: 0D/1H/25M/7S

The *Last Topology Change* field is the time interval that elapsed since the last topology change occurred. The time appears in a days/hours/minutes/seconds format.

Designated Root

Bridge ID:

0000000000000000

Root Bridge ID:

0000000000000000

Root Port:

0

Root Path Cost:

0

Topology Changes Counts: 0

Last Topology Change:

0D/1H/25M/7S