Chapter 12: MSTP

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12.1 MSTP Overview

The multiple spanning tree protocol (MSTP) overcomes the shortcomings of STP and RSTP. Inaddition to support for rapid network convergence, it also allows data flows of different VLANsto be forwarded along their own paths, thus providing a better load sharing mechanism for redundant links. For description about VLANs, refer to VLAN.

12.2 Configure MSTP

12.2.1 Enable MSTP and Configure the Working Mode

After the tree starts to give birth to a global default for all ports will participate in the spanning tree topology is calculated, if an administrator wants some of the port does not participate in the calculation of the production tree, or go to the specified port configuration mode, use the undo stp to disable the port Spanning Tree function.

Operation	Command	Remarks
Enter global configuration mode	**system-view**	
Choice STP mode	**stp mode mstp**	
Enable STP	**stp**	
Enter port configuration mode	**interface ethernet** *interface-num*	
Enable(disable) port STP	(**undo**) **stp**	

12.2.2 Configure MSTP Timer Parameter Values

MSTP timers include: forwarding delay, contracting cycle hello time, maximum aging time, andthe maximum hops. Users can configure these three parameters on the Switch for MSTP spanning tree.

Operation	Command	Remarks
Enter global configuration mode	**system-view**	
Configure bridge forward delay	**stp mst forward-time** *forward-time*	
Configure bridge hello time	**stp mst hello-time** *hello-time*	
Configure bridge max aging time	**stp mst max-age** *max-age*	
Configure bridge max hops	**stp mst max-hops** *max-hops*	

Notes:

- The Hello Time value is too long will lead to packet loss due to leaving the bridge that linksthe link failure, began to re-calculate the spanning tree; too short can cause the bridge Hello Time value configured to send messages frequently to increase the network and CPU burden.Hello Time value range is 1 to 10 seconds, recommended default value of 2 seconds. Hello Time must be less than equal to the Forward Delay 2.
- If the Forward Delay configuration is too small, may introduce temporary redundant paths;if the Forward Delay configuration is too large, the network may not be a long time to restore connectivity. Forward Delay value range is 4 to 30 seconds, it is recommended to use the default value of 15 seconds. Forward Delay time must be greater than equal to the Hello Time

+ 2.

- Max Age is used to set the MSTP protocol packet aging longest interval, if the timeout, it

discards the packet. If this value is too small, spanning tree will be more frequent, there may be network congestion mistaken link failure; If this value is too large, is not conducive to timelydetection of link failures. Max Age of the range is 6 to 40 seconds. Max Age time value and the exchange of the network diameter. Recommended default value of 20 seconds. Max Age timemust be greater than equal to 2 * (Hello Time + 1), less than or equal 2 * (Forward Delay-1).

12.2.3 Configure MSTP Identifier

MSTP configuration identifiers include: MSTP configuration name, MSTP revision level, and the MSTP instance and VLAN mapping, MSTP will have the same configuration identifier and the bridge connected to each other logically be treated as a virtual bridge.

Operation	Command	Remarks
Enter global configuration mode	**system-view**	
Configure MSTP identifier name	**stp mst name** *name*	
Configure MSTP identifiers revision	**stp mst revision** *revision-level*	
Configure MSTP instance configuration and VLAN identifier mapping	**stp mst instance** *instance-num* **vlan** *vlan-list*	

12.2.4 Configure MSTP Bridge Priority

In MSTP, the bridge priority is based on the parameters of MSTI, the bridge priority together with port priority and port path cost determines the topology of each spanning tree instance, constitute the basis for link load balancing. Switch bridge priority determines the size of this Switch is able to be selected as the spanningtree root bridge. By Configure the bridge priority of the smaller, you can specify a Switch to

become the spanning tree root bridge purposes.By default, the Switch bridge priority is 32768.

Operation	Command	Remarks
Enter global configuration mode	**system-view**	
Configure MSTP instance priority	**stp mst instance** *instance-num* **priority** *priority*	

12.2.5 Configure Root Port Protection

As the maintenance of configuration errors or malicious network attacks, network valid root bridge may receive a higher priority configuration information, so the root bridge will lose the current status of the root bridge, causing changes in network topology errors .Assuming the original traffic is forwarded through the high-speed links, this is not legally change will lead to the original high-speed links are to low-speed traffic links, resulting in network congestion. Root protection function to prevent this from happening.

Root-protection function of the port, the port can only be kept for a specified port. Once this port received a high priority on the configuration information, status of the ports will be set to the Discarding state, not forwarding packets (equivalent to the link connected to this port is disconnected).When a long enough period of time does not receive better configurationmessage, the port will revert to the original state.

In MSTP, this function works for all instances.

Operation	Command	Remarks
Enter global configuration mode	**system-view**	
Enter port configuration mode	**interface ethernet** *interface-num*	
Configure the root port protection	**stp mst root-guard**	

12.2.6 Configure Digest Snooping Port

When a Switch port uses a proprietary spanning tree with Cisco and other Switch is connected,these manufacturers' Switches configured with the proprietary spanning tree protocol, even if the same MST region configuration, the Switch can’t be achieved between the MSTP domain interoperability. Digest snooping feature such a situation. With the use of proprietary spanning tree protocol of the manufacturer's Switches connected to the port on the digest snooping feature, when receiving the manufacturer's Switches over to send a BPDU, the Switch that is from the same packet in an MST region, while the configuration summary record; when BPDU packets sent to these manufacturer's Switches, the Switch configuration summary to supplement it. This Switch is realized and the manufacturer's Switches in the MSTP region exchange.

Operation	Command	Remarks
Enter global configuration mode	**system-view**	
Enter port configuration mode	**interface ethernet** *interface-num*	
Configure digest snooping port	**stp mst config-digest-snooping**	

12.2.7 Configure Port mCheck Function

In order to flexibly control MSTP, you can open the DISABLE INSTANCE features, disable instance STP mode operating results with the implementation of no spanning-tree similar to the instance of the VLAN mapping of all connections on port forwarding state.

Operation	Command	Remarks
Enter global configuration mode	**system-view**	
Enter port configuration mode	**interface ethernet** *interface-num*	
Configuration port mcheck function	**stp mcheck**	

Note:

M check function is a prerequisite for the port must send BPDU packets, so only works on the specified port.

12.2.8 Configure MSTP Instance Is Enabled

In order to flexibly control MSTP, you can open the DISABLE INSTANCE features, disable instance STP mode operating results with the implementation of no spanning-tree similar to the instance of the VLAN mapping of all connections on port forwarding state.

Operation	Command	Remarks
Enter global configuration mode	**system-view**	
Disable MSTP instance	**stp mst disable instance** *instance-number*	
Enable MSTP instances	**undo stp mst disable instance** *instance-number*	

12.2.9 Display and Maintain MSTP

After completing the above configuration, can use the following command to view configuration.RSTP.

Operation	Command	Remarks
MSTP configuration information display identifier	**display stp mst config-id**	
Display spanning tree instance and port configuration information	**display stp mst instance** [brief [*instance-list*]]	