

Understanding STP for EX-series Switches

EX-series switches provide Layer 2 loop prevention through Spanning Tree Protocol (STP), Rapid Spanning Tree protocol (RSTP), and Multiple Spanning Tree Protocol (MSTP). RSTP and MSTP are both based upon STP. RSTP provides faster convergence times than STP. MSTP is used to create a loop-free topology in networks with a number of VLANs that require multiple spanning-tree regions to efficiently provide a loop-free topology.

STP is the simplest loop prevention protocol. It is a Layer 2 protocol that calculates the best path through a switched network that contains redundant paths. STP uses bridge protocol data unit (BPDU) packets to exchange information with other switches. There are two types of BPDUs: configuration BPDUs and topology change notification (TCN) BPDUs. BPDUs send hello packets out at regular intervals to exchange information across bridges and detect loops in a network topology. Configuration BPDUs determine the tree topology of a LAN. STP uses the information provided by the BPDUs to elect a root bridge, identify root ports for each switch, identify designated ports for each physical LAN segment, and prune specific redundant links to create a loop-free tree topology. All leaf devices calculate the best path to the root device and place their ports in blocking or forwarding states based on the best path to the root. The resulting tree topology provides a single active Layer 2 data path between any two end stations.

The original Spanning Tree Protocol is defined in the IEEE 802.1D 1998 specification. EX-series switches use a version of STP based on IEEE802.1D-2004, with a force version of 0, running RSTP in STP mode. For EX-series switches, the configuration command `set protocol stp` is equivalent to the configuration command `set protocol rstp force-version stp` for MX-series switches. In this way, STP inherits RSTP features, and commands available through CLI are identical to the RSTP CLI. This version of STP is compatible with the IEEE 802.1D 1998 specification.

RSTP was originally defined in the IEEE 802.1w draft specification and later incorporated into the IEEE 802.1D-2004 specification.

MSTP was originally defined in the IEEE 802.1s draft specification and later incorporated into the IEEE 802.1Q-2003 specification.

- Related Topics**
- show spanning-tree bridge
 - show spanning-tree interface
 - Understanding MSTP for EX-series Switches
 - Understanding RSTP for EX-series Switches

