RSTP (RPVSTP)

Improves time over ordinary spanning tree and default on most devices now.

In original STP: all VLANs share one STP instance while in PVST+ each VLAN has its own STP instance with dot1q enc.

RSTP: much faster at converging/adapting to network changes and allow all VLANs to share one STP instances, RPVST+.

Multiple STP: uses modified RSTP mechanics and can group multiple VLANs into different instances superior to RPVST+.

RSTP: is not timer based but uses a bridge-bridge handshake mechanism allowing ports to move directly to forwarding.

RSTP same as STP in blocking, root bridge, root ports and designated ports, speed in RSTP is up to 1Tb/s and 100 Gb/s and 10 Tb/s unlike STP, we only have three states (Discarding(Blocking), Learning and Forwarding) with same rules as STP.

Non designated port roles have become (alternate and backup).

Alternate: a discarding port that receives a superior BPDU from another switch as blocking ports in STP.

It's a backup to the root port, if a root port fails the switch can immediately move its best alternate port to forwarding as the new root port with no transnational states. (as a classic STP function called uplink fast).

BackboneFast: a functionality of STP built into RSTP to expire max age timers on interface with inferior BPDUS received due to a cut and forward the superior BPDUS on that interface.

Backup Port rule: a discarding port that receives a superior BPDU from another interface on the same switch when two interfaces are connected to the same collision domain via a hub (backup port for the designated port(int with lowest portid). Hubs don't participate in spanning tree.

Command: spanning-tree mode <mode>.

RSTP is classic STP compatible, interfaces on rapid stp enabled switch connected to STP enabled switch will operate in classic STP mode.

In classic STP only the root bridge originate BPDUS while in RSTP all switches originate their own BPDUS from their designated ports every hello time.

In RSTP switches age BPDU more quickly where instead of waiting for 10 hello intervals as STP, a switch considers a neighbor lost if misses 3 BPDUS, it will then flush all MAC addresses learned on its surface.

RST{ linktypes: edge → a port connected to an end host and moves directly to forwarding without negotiation (portfast built in).

To manually configure: spanning-tree portfast.

Point to Point: a direct connection between two switches and operate in full duplex.

To manually configure: spanning-tree link-type point-to-point.

Shared: a connection to a hub must operate in a a half duplex mode.

To manually configure: spanning-tree link-type shared.

The root bridge has a designated port in each collision domain it's connected to.

Edge ports can be connected to a hub and together with P2P or shared.

Spanning-tree auto-edge-port: Supports the automatic identification of edge ports. The port will look for BPDUs for 3 seconds; if there are none it begins forwarding packets so manually configuring them is for faster convergence.