

# The Complete Evolution of Spanning Tree Protocol

## 1. Genesis

Ethernet's flaw was lack of loop prevention, causing endless broadcast storms.

## 2. IEEE 802.1D

Introduced STP with root bridge election, port roles, and blocking. ~50s convergence.

## 3. Cisco PVST

Per-VLAN STP with load balancing but scalability issues.

## 4. RSTP (802.1w)

Faster convergence (~1s), simplified port states, proposal/agreement handshake.

## 5. MST (802.1s)

Groups VLANs into STP instances; scalable for large enterprise networks.

## 6. Interop & Failures

BPDU Guard, Root Guard, Loop Guard to prevent misconfigs and rogue BPDUs.

## 7. Modern Fabric

VXLAN, MLAG, EVPN-most new fabrics avoid STP entirely.