5 STP Concepts

5.1 Purpose of STP

- Redundancy, Loop-Free, Issues: MAC address table instability, link saturation, high CPU utilization
- Vgl. Layer 3: TTL, Hop Limit
- Layer 2 Loop: Broadcast Storm
- The Spanning Tree Algorithm
  - Select the Root Bridge
  - Block Redundant Paths
  - Loop-Free Topology
  - Link Failure Causes Recalculation

5.2 STP Operations

- Steps to a Loop-Free Topology
  - Elect the root bridge: kleinste BID
  - Elect the root ports (1 pro Switch): kleinste Root Path Cost
  - Elect designated ports (1 pro Segment): am nächsten zur Root-Bridge
  - Elect alternate (blocked) ports (alle anderen Porsts)
- BPDU (Bridge Protocol Data Unit)
  - BID (Bridge ID)
    - Bridge Priority (4 bit): Vielfache von 4096. Default 32768. Je kleiner, umso besser
    - Extended Sytem ID (12 bit): = VLAN-ID
    - MAC Address (48 bit)
- STP Timer
  - Hello Timer
  - Forward Delay Timer
  - Max Age Timer
- Port States
  - Blocking
  - Listening
  - Learning
  - Forwarding
  - Disabled
- PVST (Per-VLAN Spanning Tree): jedes VLAN kann eigenen Root-Bridge haben

5.3 Evolution of STP

- Different Versions of STP
  - STP, PVST+, 802.1D-2004
  - RSTP, Rapid PVST+
  - MSTP, MST
- RSTP Port States and Port Roles
- PortFast and BPDU Guard
- Alternatives to STP