CSET 2200

Spanning tree

Questions

Completion of VLAN Demo

Spanning Tree - The problem

- ▶ Loops
- ▶ Need to add redundent links
- ▶ Backup without intervention

Solution - Spanning Tree

- Develops a loop free topology
- Defined in 802.1D
- Updated over the years
- 802.1Q is most recent

Spanning Tree (contd)

- Spanning tree selects a root bridge
- Bridge with lowest priority
- If tied lowest mac

Spanning tree (contd)

- Each switch finds lowest cost path to root
- Costs vary based on technology
- Ethernet uses bandwidth
- Lowest cost port is root port (RP)

Spanning tree (contd)

- Each segment finds lowest cost to root
- Port connecting that segment is designated port (DP)
- All ports that aren't RP or DP block

BPDU

- ▶ Spanning tree communicates with BPDU
- ▶ Stands for Bridge Protocol Data Units
- ▶ Exchanged regurally (2 seconds)

Learning process

- ▶ Ports comes up and blocks
- ▶ Listening (Waiting for BPDU)
- ▶ Learning (Populates MAC table but still block)
- ▶ Forwarding (Passes data)
- ▶ Could also be Blocking or Disabled

Time to converge

- Default for Listen and Learn each 15 seconds
- Means ports take 30 seconds to come active
- Can cause outages as networks reconfigure

VLANs and STP

- All VLANs shared a tree origionally
- Two technologies to solve
    - Multiple Spanning Tree (MST)
    - Per VLAN spanning tree (PVST)

Other improvements

- Rapid Spanning Tree improves convergence time
- RPVST

Design Considerations

- Want root towards the middle of the network
- Careful root design is important in large network
- With PVST want all links active between VLANs

Example

Questions

Next session TBD – will email

- Maybe NAT
- Maybe ACL
- Need to review Lab