



## Switched LAN Stabilization Project Summary

### The challenge

Chesapeake NetCraftsmen was engaged by this large medical information warehousing corporation to address issues related to the stability of their switched LAN which had come to light as the result of a previous Network Assessment project performed by Chesapeake NetCraftsmen.

### The Chesapeake NetCraftsmen solution

While the client's network team was fully capable of segmenting the Cisco switched LAN infrastructure, a few important items needed to be addressed, which, though subtle, were critical to the switched network and affected the stability of the entire switched infrastructure.

These items included Spanning Tree design, removal of an unnecessary bridge loop, the re-implementation of Spanning Tree, and the proper application of appropriate Catalyst OS features such as UDLD and UplinkFast. These actions, performed by a senior Chesapeake NetCraftsmen consultant with considerable design and implementation experience, added stability to the client's network.

### The Master Network Diagram

A master network diagram showing Spanning Tree port states under normal operating conditions (i.e., location of the root bridge for each VLAN, location of all forwarding ports, and the location on the blocking port per-VLAN) was created to facilitate troubleshooting, and Layer 1 and 2 network changes.

### Written Implementation Design

- Reconfiguring the Spanning Tree topology from scratch so that the bottom gigabit uplink port in each stack is the blocking port per VLAN (for better predictability and easier troubleshooting)
- Reconfiguring STP root and backup root bridges per-VLAN for ease of implementation and decreased staff ramp-up time
- Aligning HSRP active Router with new STP root bridge per VLAN
- Enabling UplinkFast only on appropriate switches for better predictability
- Enabling Unidirectional Link Detection for better stability
- Ensuring link speeds, duplex settings, and trunking details are correctly set for all switch-to-switch ports
- Ensuring that Gigabit EtherChannel is configured correctly per best practices
- Ensuring that unnecessary loops are removed from the physical topology
- Ensuring that all trunks are configured per Cisco's recommended guidelines
- Ensuring that all switches/routers run the TAC-recommended version of CatOS/ IOS

- Setting the VTP mode to transparent for better stability.

### **Team Briefing and Pre-Implementation Preparation**

Chesapeake NetCraftsmen met with the client's staff to discuss the master network diagram and all Spanning Tree details in depth. Pre-implementation preparation focused on the work described above as well as upon migration issues.

### **Implementation**

- Ensured that unnecessary bridging loops were removed from the physical topology.
- Upgraded CatOS and IOS code as needed
- Reconfigured the Spanning Tree topology to make the uplink port on the bottom switch in each stack the blocking port for each VLAN
- Reconfigured STP root and backup root bridges per-VLAN (odd VLANs on one core switch A, even VLANs on core switch B)
- Enabled UplinkFast only on appropriate switches
- Enabled Unidirectional Link Detection
- Ensured that link speeds, duplex settings, and trunking details were correctly set for all switch-to-switch ports
- Ensured that Gigabit EtherChannel was correctly configured
- Ensured that the HSRP active router exists on the root bridge for each VLAN
- Ensured that MLS was correctly configured on the core 6500 switches, according to the desired flow mask
- Setting the VTP mode to transparent for all switches per the design
- Testing to make sure the Spanning Tree topology was correct for each VLAN
- Manual fail-over testing
- Testing applications and connectivity from each VLAN after the above changes were been implemented
- Configuring NTP on all switches and MSFCs
- Providing on-site support post-implementation to ensure that the network operated as expected.

### **The results**

Following Chesapeake NetCraftsmen's work, this client's switched LAN is much more stable, applications run smoother and faster, and they can concentrate on network expansion and future upgrades rather than constant troubleshooting.