Redundancy in the UCAR Network

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February 19, 2008
Service Criticality Levels

- **Level 1 – Facilities Life Safety Components**
  Fire Systems, Elevators, Physical Security, Phones/911 Access

- **Level 2 – Critical Corporate Services**
  Power, Network Connectivity, DNS, Authentication, Corporate Financial Systems, Email, Super Computing & Mass Store

- **Level 3 – Divisional & Secondary Services**
  Central & Division Computing, UCAR Web, VPN, Wireless Network, RAS, Long Distance Telephony

- **Level 4 – Central Corporate Applications**
  End-User Business Applications
Resiliency

One way to mitigate outages is to integrate redundancy in the system hardware and services

- In the Network Closet
- On the Campus
- Between the campuses
- Over the WAN
- In the Phone System
In the Network Closet

- Redundant Power
  - Wall
  - UPS/Generator

- Redundant Supervisors

- Etherchanneled uplinks
On the Campus

- Routing in 2 chassis per campus
- 2 Paths from each closet to the core
Layer 2 Hardening

Part of the Routing Redundancy project includes optimizing spanning tree for fast convergence and protection.

- Place the Root where you want it
  The primary core switch should be the Root of the vlan, the ports to the secondary core switch should be blocked by spanning tree.

- Only end station traffic should be seen on an edge port
  Enable BPDU Guard on the edge/host ports
Other Changes

- Move routing for the Voice vlans to the campus routers

- Upgrade primary core switches to Sup720
  - Convert flra and cgra from CatOS to IOS

- Upgrade primary paths to 10G ML – FL and FL – tcom
Between the Campuses

- BRAN
- Wireless Backup
Over the WAN

- BiSON
  (top ring)

- FRGP/DREAM
  (bottom ring)
In the Phone System

- Cluster Call Control
- 911 Service
- Trunking
- Voice Messaging is not redundant
- Power
Summary

- Complexity can undermine reliability
  - keep it simple

- Single Points of Failure
  - Ports to office
  - Voicemail
  - BPoP Switch

- Test
  - How do you know it works?

- You are never done