



High Availability LAN

How Cisco IT Achieved a High Availability Enterprise LAN



A Cisco on Cisco Case Study: Inside Cisco IT

Overview

- Challenge

 - Achieve “five nines” (99.999%) availability for the LAN at the Cisco Systems® headquarters campus

- Solution

 - Implement backup power, a high-availability network design and equipment configurations, and operational processes

- Results

 - Achieved 99.999% availability in key LAN areas by July 2003

Challenge: Achieve 99.999% Availability

- Cisco headquarters campus – San Jose, CA
 - Employee offices
 - Data centers
 - Labs
 - Manufacturing facilities
- Network equipment
 - 900 switches, 200 routers, 800 Cisco Aironet® wireless access points
 - Console servers and content switching devices

Challenge: Achieve 99.999% Availability (Contd.)

- Minimum network availability of 99.99% required to function effectively = 1 minute downtime/week
- Goal: 99.999% network availability = 6 seconds downtime/week

Solution: Network Design, Power, Processes

- Incremental upgrades to move from 99.9% to 99.99% to 99.999% LAN availability
- Multiple steps in each upgrade to address:
 - Network design
 - Power supplies
 - Operational processes

Solution: Achieve 99.9% Availability

- **Steps:**

- Availability measurements

- Outage alerts & root cause analysis

- Separate physical & logical hierarchies in the network design

- Critical devices on UPS

- Redundancy provisioned

- Change management processes

- Emergency spare parts

- Out-of-band management

Solution: Achieve 99.99% Availability

- **Steps:**

- Proactive redundancy checking

- All devices on UPS

- Critical devices on generator power

- Automated router configuration audits

- Change management integrated with availability monitoring

- Standardized code versions

- Troubleshooting training

- Separated incident management from problem resolution

Solution: Achieve 99.999% Availability

- Steps:
 - All devices on generator emergency power
 - Automated switch configuration checking
 - Semiannual manual auditing
- Implemented only in core areas of the Cisco network, where these steps would be most cost-effective

Results: Improved LAN Availability

- Achieved 99.992% overall LAN availability in 2002
- Availability improved to 99.999% in key LAN areas by July 2003
- Separated production and alpha (test) networks
- Leveraged the design knowledge of Cisco Advanced Services and the troubleshooting expertise of the Cisco Technical Assistance Center

To read the entire case study, or for additional Cisco IT case studies on a variety of business solutions, visit Cisco on Cisco: Inside Cisco IT

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