



Design Proposal Document

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Executive Summary

This proposal is designed to meet all requirements in the Request for Proposal (RFP) to migrate from a 10-100Mbps network to a managed, Gigabit Ethernet-compatible switched network. Our updated design replaces previous switches with Cisco 3800 series models, 10Gbps uplinks, Wireless Access Points, and a new ASA 5585 firewall. Additionally, it includes provisions for a 5% growth in network capacity.

Business Goals

Implementing Gigabit Ethernet will boost productivity for both students and staff, enabling the college to expand academic offerings and support virtual classrooms. This modernization enhances Waycool College's competitive edge while maintaining cost-effectiveness. Though the initial investment is substantial, maintenance is cost-efficient, with potential tuition revenue from new students offsetting expenses.

Technical Goals

Our design accounts for 5% growth over five years, including one 10-Gbps uplink per 12 switch ports and adequate wireless coverage via Cisco Aironet 2602i Access Points. Security has been strengthened with Cisco's 3850 series switches, which support port security, centralized log monitoring, and enhanced password protection. Additionally, the ASA 5585-X SSP 20 Firewall provides filtering, integrated IPS, and VPN capabilities to support up to 10,000 remote connections.



Summary of Changes by Building

IDF302 – Main Office

- 62 devices, including 34 users and 28 VOIP.
- Two Wireless Access Points.
- WS-3850-24U switch and WS-3850-48U switch linked with Stackwise cable.

IDF303 – History Building

- 68 devices (5% growth included).
- Three Wireless Access Points.
- WS-3850-24U and WS-3850-48U switches with six 10Gbps uplinks.

IDF315 – English Building

- 48 devices with 5% growth accounted.
- Two Wireless Access Points.
- WS-3850-48U and WS-3850-24U switches with Stackwise link.

IDF393 – Political Science

- 66 devices with 5% growth.
- Three Wireless Access Points.
- WS-3850-24U and WS-3850-48U switches with six 10Gbps uplinks.

IDF322 – Science

- 48 devices, plus two for Observatory extension.
- Three Wireless Access Points.
- Two WS-3850-48U switches with MMF cabling for the additional Observatory load.

IDF325 – Observatory

- 24 devices, including 3 VOIP.
- Two Wireless Access Points.
- One WS-3850-48U switch with two 10Gbps uplinks.

MDF301 – Main Computer Room

- 27 fiber runs with three WS-C3850-12XS switches.
- WS-C3850-24U switch for server dual NICs and ASA5585-S20-K8 firewall.



Routing Protocol Selection

We selected EIGRP over OSPF due to its proprietary compatibility with Cisco, CPU efficiency, and superior scalability and maintenance. EIGRP's loop-free path backup offers an added reliability advantage.

Device Naming Standard

Our naming convention ensures easy identification, scalable across campuses. Each device name begins with the state (WI), followed by campus (PACK), device type (SWC for Switch, WAP for Access Point, FIR for Firewall), and a unique identifier (e.g., WIPACKSWC02 for a switch in the Main Computer Room).

IP Addressing Standard

The IP Addressing Scheme assigns each VLAN a unique subnet, utilizing the 192.168.x.x range, except for the management VLAN on 172.16.1.x. This setup simplifies identification and enhances security, with separate VLANs for wireless traffic among students, staff, and guests.

Closing

Thank you for considering our proposal. We believe these recommendations align with the institution's needs and objectives. Key points:

- All network equipment was replaced with Cisco models.
- Redesigned subnets and VLANs.
- EIGRP chosen as the routing protocol.
- Business and technical goals tailored to the RFP's specifications.

Following this document, please refer to:

- **Exhibit A:** VLANs and Subnets Spreadsheet
- **Exhibit B:** Bill of Materials
- **Exhibit C:** Updated Network Diagram