OFFICE OF NAVAL RESEARCH

Networking Team
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OUTLINE

The Implementation of
Point-to-Point Infrared
Local Area Network (LAN)

Pre - Planning

The existing 300 MHZ G3 Power Macs were examined to determine if the hard drive stored outdated software. Their hard drives were also analyzed to see if the transfer of data would be increased, maintained, or decreased. The size of memory was considered to make sure there was enough storage capacity for data, such as video and digital files. The operating system and the ROM revision was checked to confirm that the system could be upgraded.

Dated System

Hard ware Platforms	G3 Power Mac 300 MHz
Hard drive size	6 GB
Memory size	128 MB
Operating system	Mac version 8.6 and 9.1
ROM revision	$77D.45F6

Table 1 - Summary of existing hardware system

During the initial site walk analysis the networking team identified Ethernet 10/100Mbps category 5 twisted-pair cables that were taking up a lot of space because the cables were not arranged in an orderly fashion. The exposed cables were potentially dangerous and if the cables were pulled accidentally one or more G3s could have fallen to the floor.

LAN

Physical Media	Data Port Wall Jack Data Link Ethernet 10/100 PCI Card

Table 2 - Existing Physical Media

Proposed

The proposed design called for a software and hardware implementation plan that would be implemented in three phases. Phase one involved the hardware configuration and upgrading the memory from (128MB to 448 MB), Skyline cards, and base stations. The Skyline PCI cards were installed to transfer and receive signals from the computers to the base stations. The second phase required monitoring the communication between the Power Mac G3 and the Airport base station. The point -to- point electromagnetic airwaves were observed using the wireless computer signal strength and CPU system performance. The final phase of implementation is the installation of the Mac OS X and the Encore/ZIF G3/G4 500

MHz processor chip. The Mac OS X has an industrial strength UNIX-based foundation to accompany the existing ONR IREX Silicon Graphics 02 UNIX lab. The addition of Mac OS X will increase the overall system performance and bring software uniformity to the desktop.

Implementation Phases

Phase 1	Configuration and installation of the memory size, Skyline Airport Card base stations
Phase 2	LAN observation, involving monitoring PC communication with base stations
Phase 3	Installing Mac 10 OS, ZIF G3/G4 500 MHz /1M, Airport Base Station

Table 3 - Implementation phases

The Encore/ZIF G3/G4 500 MHz processor chip was installed to improve both front and backside data processing along the logic board BUS by fifteen percent. Thus allowing an overall system performance gain of twenty-five percent at the data transmission level and system application level. The addition of two base stations will create a load balancing effect that will allow data traffic to be divided among three access points, which will result in a decrease of bandwidth from the access point to the switch.

LAN

Physical Media	Category 5 Ethernet 10/100 Mbps
Signaling Method	Infrared: Point-to-point Electromagnetic Airwaves

Table 4 - Existing and Proposed LAN

SCALIBILITY

The existing wireless Mac lab will give the ONR Research facility the ability to integrate the IRIX Silicon Graphics O2 Unix lab into wireless Unix machines. Wireless LAN/WANs allow end-users to access and transmit data from anywhere within the signal scope. A wireless network removes the "ball-and-chain" concept of computers because each host system does not require a Category 5 Ethernet 10/100 Mbps between Host NIC (Network Interface Card) and RJ45 data jack. The removal of twisted pair cable reduces Lab maintenance by not running cables through the ceiling and purchasing new cables to replace damaged cables; thus giving the lab an organized appearance Furthermore, a wireless network allows a data engineer to fix most network problems remotely.

Security

Security is a vital part of any network's infrastructure and architecture. Theft of software and hardware costs organizations thousands (sometimes millions) of dollars. To prevent and/or minimize computer theft safeguards must be put in place. The NASA/ONR Research Facility of Lester Hall, Room 114, at Elizabeth City State University, is using computer case locks and lock nuts for the Internet network servers and the Windows machine. Administrative passwords have been installed on all the computers to keep unwanted people from having access to delicate folders. Also, the Apple cases for the computers have a built-in security socket to install lock and cord.

The implementation of a cage system will prevent theft, tampering and misuse of the Airport Base Stations, which are the LAN access points. Additional security measures, such as using SecureWare locks to secure the monitors and system units.

The most important security issue would be the protection of the vital computer information from being accessed and compromised by hackers. Special features such as sniffers, Campus Area Networks (CANs), and key management through the use of Certificate Authority (CA) and Smart Cards can be used to prevent unwanted traffic from entering the servers.

To prevent unwanted data access and hardware and/or software theft, a security plan that includes procedures for locking down hardware and system units must be implemented and reviewed every three months.

Topography

Microsoft Visio Professional allows users to diagram high-level network topologies and visualize the complexity of an existing network. A diagram of a network's topology makes it easier to troubleshoot the network's infrastructure because you have accurate and detailed information to refer to. It also provides templates for various diagrams including Entity-Relationship diagrams, Decomposition Process Diagrams and different levels of Data flow diagrams in these templates.

Lester Hall Room 115,

Before Wireless Networking Capabilities
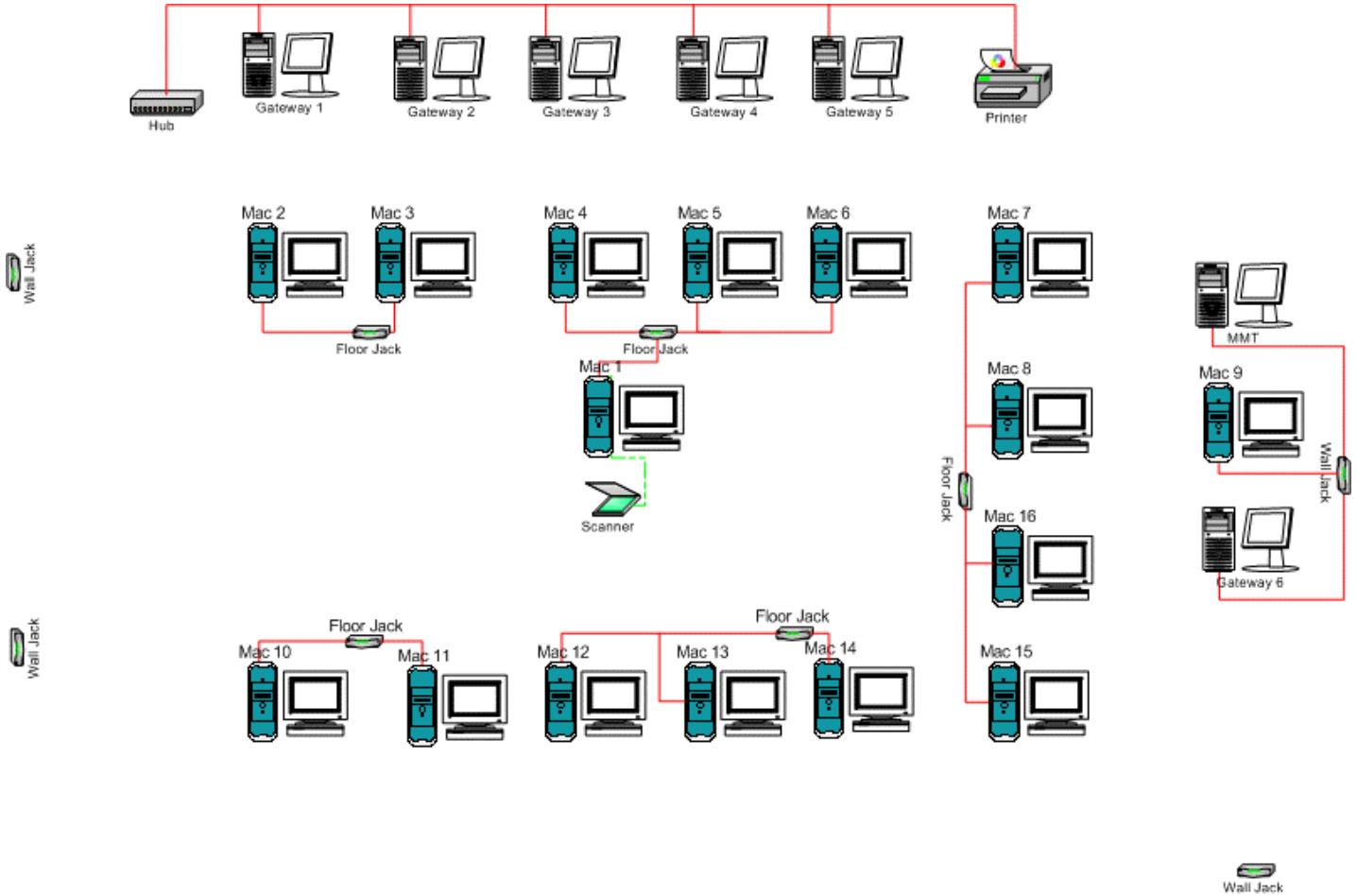
LAN and WAN Diagram
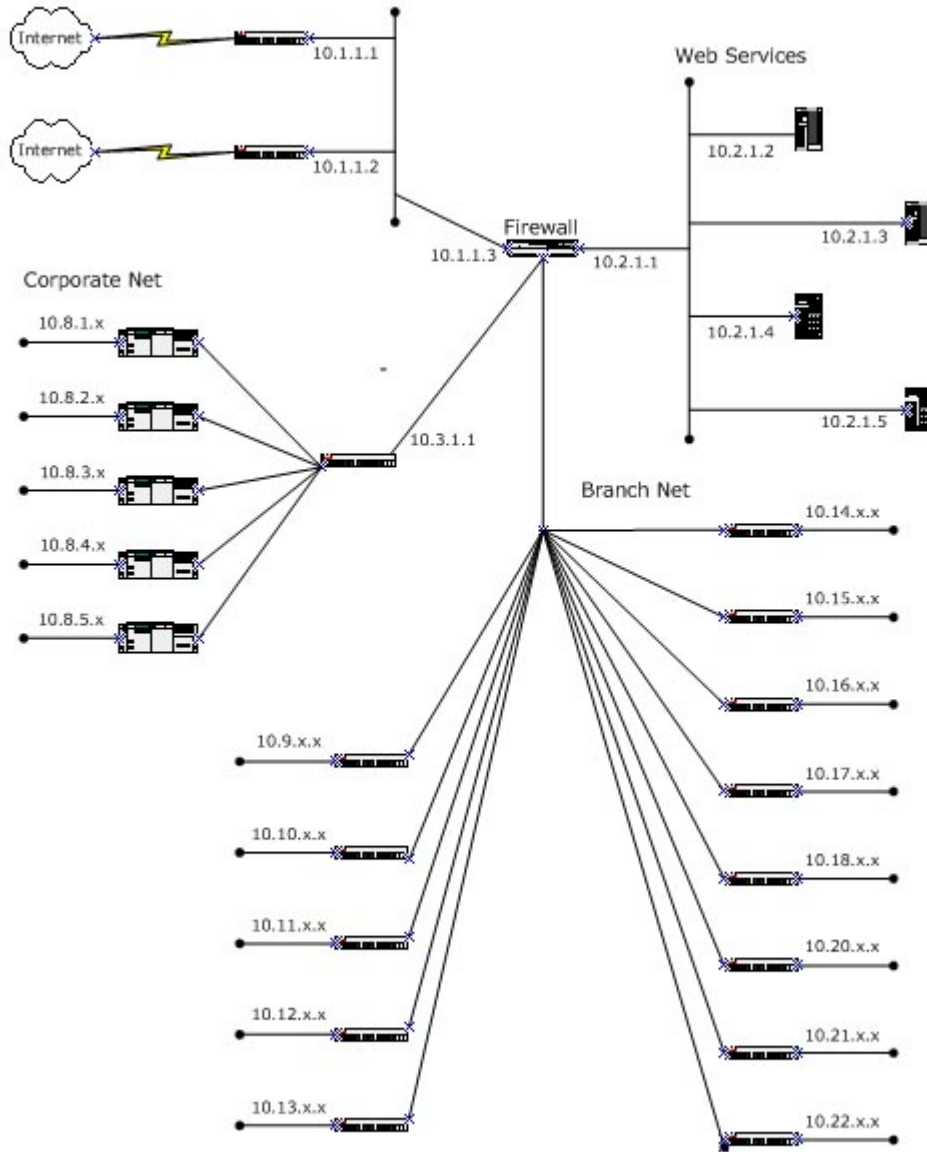
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