Request For Proposal (RFP)

CAL STATE LA
CALIFORNIA STATE UNIVERSITY, LOS ANGELES

Prepared by Group 2 W 12:15pm – 1:30pm:

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Prepared For:

California State University Of Los Angeles
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Background

California State University - Los Angeles, also known as CSULA, is a public university that is located in East Los Angeles, California; It is a very well-known university that provides a multitude of Bachelor's, Master's and Doctorates degrees in various disciplines.The campus facility that is the subject of our network proposal is known as the Martin Luther King Jr. Hall, or King's Hall for short, which is located at the North-East edge of the university. Specifically, the 1st floor of the building will be the area that will undergo the network design. The floor itself contains more than 50 offices and 20 classrooms.

Project Scope

The scope of this work will include the design, implementation and testing of a network that is based off of a switch star topology, in which each node, or device, will be connected to a central switch. The rollout of this topology will include, but will certainly not be limited to the installation and implementation of routers, switches, CAT6 cabling, servers and workstations into the network. The full list of equipment that will be used will be listed under the system components and bill of work portion of this document.

Feasibility Study

Project Situation

The planned analysis for the Local Area Network that will cover the 1st floor is expected to have an estimated cost of $82,387.77 The proposed method of funding for this project, granted it is approved, will be provided by the university as under its 2020-21 Campus Operating Fund Budget for Information Technology Services; additionally, the project is also open to fundraising events organized by the CSULA Student Union to cover a portion of the cost if the university wishes. As for the implementation itself, the project would be expected to take up to about five to six weeks to complete with an additional two to three weeks to troubleshoot the network and make any changes deemed appropriate. Once the project is approved and funding secured, the university has requested for the work to be carried out as soon as possible, as the covid-19 pandemic has significantly limited the amount of students and faculty on campus.

Network Scope

Generally, the 1st floor of King's Hall consists of 4 wings each with a different number of rooms and room types.Per a prior walkthrough of the building, it has been determined that each office should contain a minimum of four desktops with monitors, and at least one printer (if able to accommodate); each classroom should contain at least one workstation with a monitor and printer (if needed), and computer labs should contain at least 35 computers with monitors and at least one printer.

Objectives

The proposed network is designed to fulfill the following four foundational campus infrastructure objectives and a single education driven objective:

1. *Security* - First and foremost, the design must provide a secure network service for its intended users. The security infrastructure will be designed to prevent unauthorized users from accessing the network; in turn, this will boost user confidence.

2. *Optimal Network Performance* - Considering that technology is consistently evolving, often previously used components often become out-of-date within a given timeframe. The network will be designed to work with already existing workstations while simultaneously implementing newer up to date equipment into the infrastructure in order to make sure the network within King's Hall is running as optimal as possible.

3. *Versatility* - The network will enable users to retrieve, process, and exchange information between computers and devices from within the greater CSULA network; this includes, at the very minimum, text documents, emails, pictures, audio, and video.

4. *Scalability* - As previously mentioned in the optimal network performance objective, this network will be designed to add or upgrade equipment as needed. This type of scalability will be beneficial to keep up with the network needs of King's Hall.

5. *Enjoyability* - The most important objective of this project is ensure that each student and faculty member that uses the network will have a good overall experience utilizing it for their daily tasks.

Intended Users - The intended end users of this network will primarily be faculty members and the students of Cal State LA

Network Needs Analysis

Data Types

The type of data needed by this network will need to be one that will cover a long-range. With 50 offices and 20 classrooms needed to be covered, it is expected to transmit many files like reports, web pages, text files, and video files.

Data Sources

There will be software installed in each workstation out of the 50 offices and 20 classrooms. This software will be Microsoft Office Suite, VPN, Security Suite, Internet Browser, VLC Player, Adobe Reader (PDF), Video Conferencing Software, and Email Client Software. Another software that might be installed is SAP Business Analytics; this will ultimately depend on the professor's and the staff's request.

Numbers of Users And Priority Levels

A rough estimate of 100 users would be accessing the network. There is going to be priority given to workstation and devices. It will only be applicable to workstations and devices connected to the network through Ethernet. This will mean users who are not accessing the network are students and staff who are doing non-priority tasks.

Transmission Speed Requirements

The network is transparent to users with high-level access and professors. The reason being is that we want to provide a high-speed network for the 50 offices and 20 classrooms when taking up bandwidth simultaneously. This will mean that users with high-level access and professors will be able to perform applications, download files, upload files as quickly as possible. Due to this, the network will be non-transparent for students.

Load Variation Estimates

When researching the 1st floor of King Hall, it seems to be that Monday through Thursday from 8:00 am to 5:45 are the busiest time. The peak time between Monday to Thursday is 9.40 am to 3.00 pm. From Friday to Sunday, it seems that King Hall is not very busy; this might be due to no classes being held or offices being closed.

Reliability Requirements

In corresponding with the current network and meeting user requirements, it is expected that the LAN to be operating at 99.9% uptime and an undiscovered error rate of .001%.

Security Requirements

The first portion of security is a firewall to prevent unauthorized access to anyone who does not have a username and password. The second portion of security consists of limited access, depending on the user account and password. For example, students will have different access compared to Cal State LA staff.

Software Requirements

- Microsoft Windows 10
- Microsoft Office Suite
- Mozilla Firefox
- Google Chrome
- VPN
- Security Suite
- Video Conferencing software
- Adobe Reader (PDF)
- Email Client Software
- SAP Business Analytics

Detailed Design Documentation

Dell - Precision 3240 Compact Desktop Workstation

- $839
- Available/In Stock
- Intel Core i3, 8GB Ram, 250GB SSD
- Basic on site service 12 months

Epson - Expression Home XP-4100 Wireless All-In-One Inkjet Printer

- $99.99
- Available/In Stock
- Prints up to 10 ISO ppm in black and up to 5 ISO ppm in color
- 1 Year Manufacturer Parts and Labor

Samsung - S22E200B 22"

- $102.89
- Available/In Stock
- Full HD 1920 x 1080, 60Hz, VGA, DVI, Flicker-Free Technology, Widescreen LED, Backlit LCD Monitor
- Limited 1 Year Parts and Labor

Dell - PowerEdge MX5016s Storage Sled

- $3329
- Available/In Stock
- 4 X 300GB,
- 3 Year Basic Next Business Day

Micro Connectors - CAT 6 UTP RJ45 Cable

- $49.99
- Available/In Stock
- 150 Feet, molded boots, extra protection for the RJ45 connector and clip
- Serviced by Computer Services

Linksys - EA9500 Max-Stream AC5400 MU-MIMO Gigabit WiFi Router

- $349.99
- Available/In Stock
- Tri-Band Technology, Supports WiFi Speeds Up to 5.3Gbps, 8 Gigabit ports, 8 External Antennas
- 3 Year Warranty and Tech Support

TP-LINK - Archer C7 AC1750 Dual Band Wireless Router

- $89.99
- Available/In Stock
- 2.4GHz 450Mbps, 5Ghz 1350Mbps, 2 USB Ports, IPv6, Guest Network
- 2 Year Warranty and 24/7 technical support

Cost-Benefit Analysis

Cost Analysis

Product	Price	Quantity	Total
Dell - Precision 3240 Compact Desktop Workstation	$839.00	65	$54,535.00
Epson - Expression Home XP-4100 Wireless All-In-One Inkjet Printer	$99.00	12	$1,188.00
Samsung - S22E200B 22"	$102.89	65	$6,687.85
Dell - PowerEdge MX5016s Storage Sled	$3,299	1	$3,299.00
MIcro Connectors - CAT6 UTP RJ45 Cable	$49.99	10	$499.99
Linksys - EA9500 Max-Stream AC5400 MU-MIMO Gigabit WiFi Router	$349.97	1	$349.97
TP-LINK - Archer C7 AC1750 Dual Band Wireless Router	$89.99	2	$179.98
Belkin RJ45 Plug, 50 Pack	$18.99	2	$37.98
Tempo Ultimate Technician Tool Kit	$610.00	1	$610.00
Labor per hour	$50.00	200	$10,000.00

Subtotal of Costs			
Maintaining Network	$5,000.00		
Total Cost			**$82,387.77**

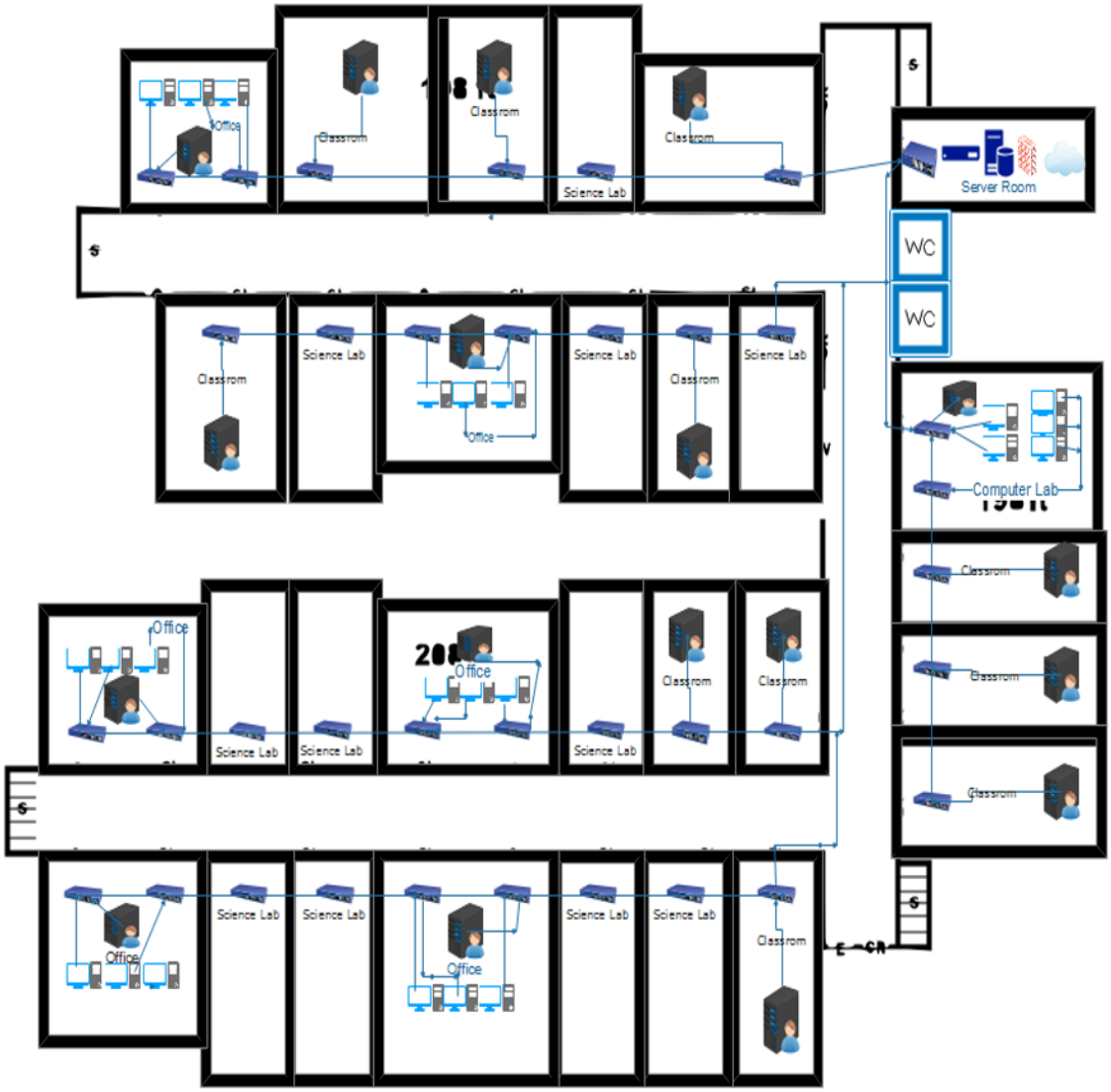
Benefit Analysis

Product	**Price**	
Increased Productivity	$35,000.00 yr	
Increased Reliability	$12,000.00 yr	
Connectivity between wings	$20,000.00 yr	
File safety (Lose less files)	$15,000.00 yr	
Faster record availability	$15,000.00 yr	
Total		**$97,000.00/yr**
Intangible benefits		
Staff morale increase	$15,000.00 yr	
Increased support	$35,000.00 yr	
Total		**$50,000.00/yr**
Total Benefit Analysis = $147,000.00/year		

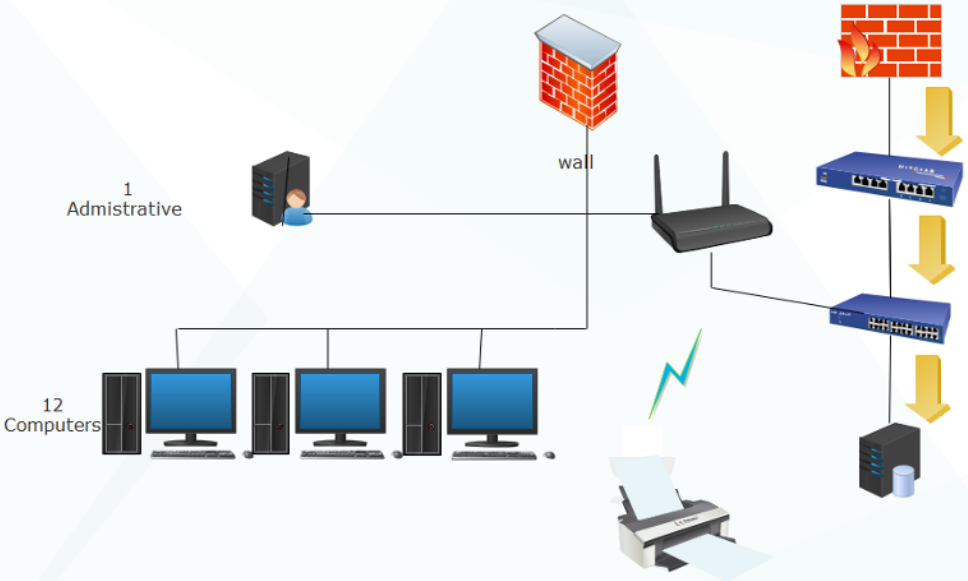
Total Cost	**$82,387.77**
Total Benefit	**$147,000.00**

- **Annual benefit exceeds annualized cost**

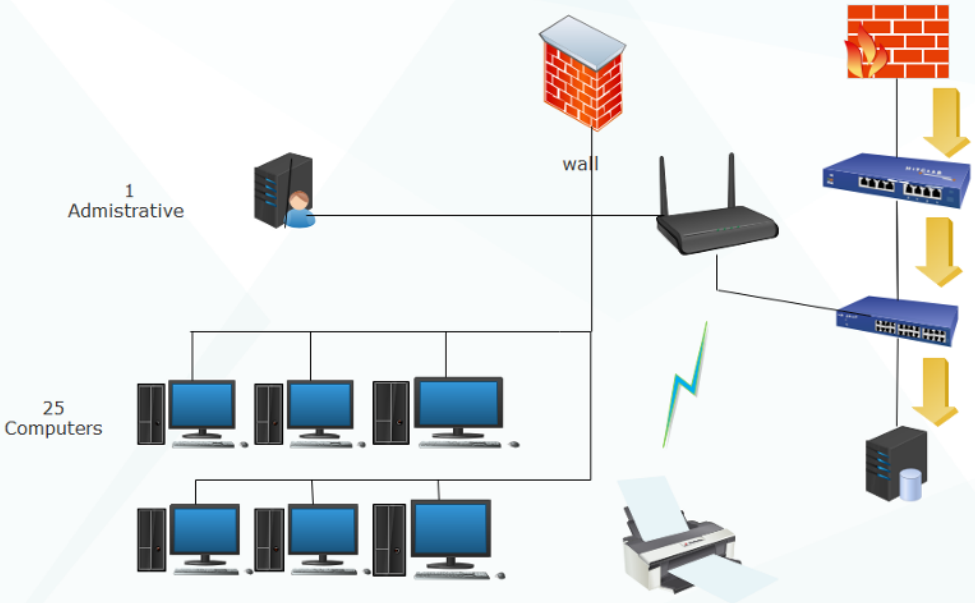
Logical Design

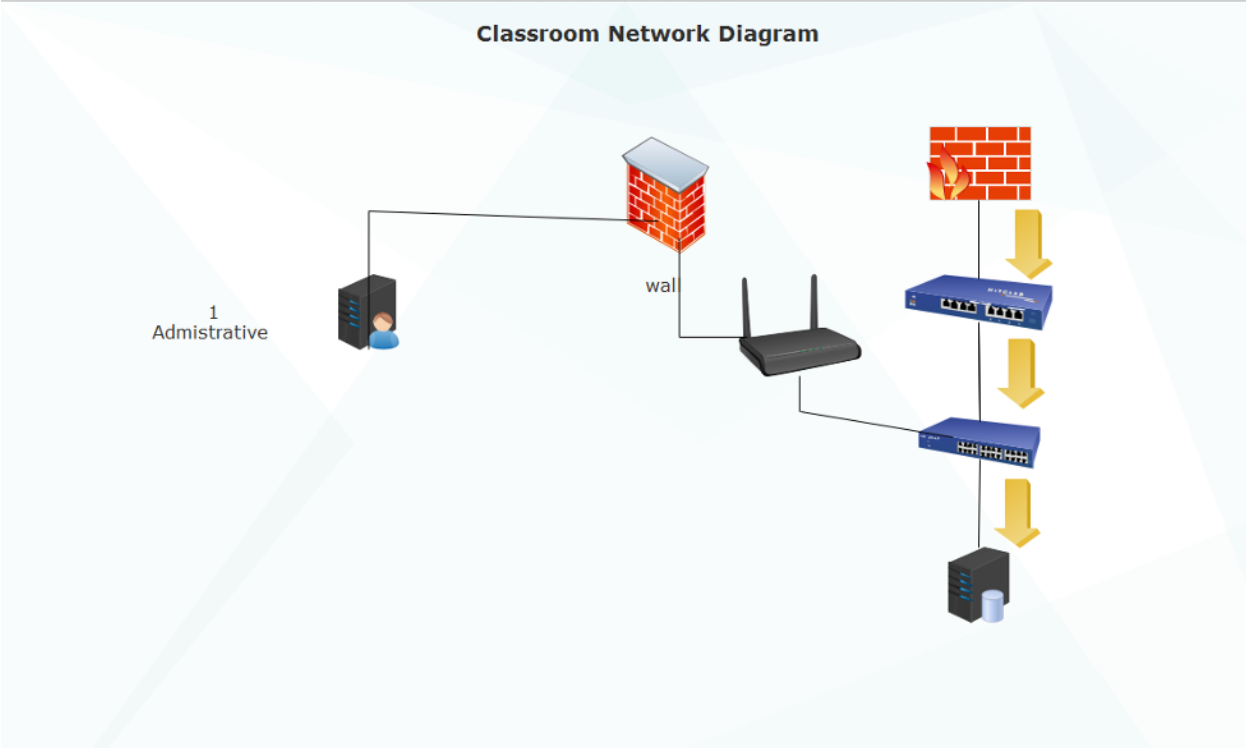


Office Room Network Diagram



Computer Lab Network Diagram





Results of Network Design Testing

For our network design testing, we have conducted the following test:

- Ping Equipment
- Ping Servers
- Security Testing
- Availability Testing
- Application Load Testing
- Equipment Script Testing

Project Schedule

According to the total amount of labor required to spend on this particular project the plan will take about an estimated 2 weeks to implement. Ordering the hardware would take 4-5 days, followed by delivery of the equipment would take an additional 2 days. After receiving all required parts,

then we can proceed with the installation of all computer equipment and cable wiring which will take about an estimated 5 days to compete an additional 2 days of testing all necessary equipment. After all equipment has been installed and test we can our connection to the buildings New network has been completed.

Assigned Responsibility

Background - Hector Garnica

Project Scope - Hector Garnica

Feasibility Study - Hector Garnica

Network Needs Analysis- Michael Campos

Detailed Design Documentation - Albert Gomez

Cost-Benefit Analysis - Edward Hernandez

Logical Design - Paul Figueroa

Results of Testing - Paul Figueroa

Project Schedule - Paul Figueroa