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CIS122 Essentials of Networking
Project #3: Prepare the network infrastructure of a new site

Project objective:

- The renovation of the network infrastructure will provide better transfer speeds between the cubicles, offices and the outer world. By running fiber, the company will be certain to receive the necessary speeds delivered to the strategically placed service rooms. Additionally, all cubicles will have all the necessary telephones installed and accounted for. Moreover, the different WAN/Wifi points ensure that the entire building has internet connection; these connections are equally necessary to ensure the company's connectivity. Lastly, firewalls, printers, copiers, and all other necessities are covered and accounted for in order to ensure that this network infrastructure is at its finest. The entire network infrastructure was designed with future expandability in mind.

Equipment used:

1. Switches (5 Total)
    a. 24-port Gigabits (5)
2. Cat6 Ethernet Cable Box (2 Total for Future)
3. Fiber Optic Cable (3 Total)
    a. LC-50 ft (2)
    b. LC-150 ft (1)
4. WIFI Routers (11 Total)
5. Patch Panel (5 Total)
    a. Service Room A (2)
    b. Service Room B (2)
    c. Data Center (1)
6. Rack (6)
7. Firewall (1)
8. SFP Adapters and Printers/Copiers
9. RJ45 Crimper and Wire Stripper
10. RJ45 Connector Tips

	Equipment Description	Item Description	Vendor	Vendor Item #	Retail Price	Actual Price (If Known)
1	24-Port PoE+ Smart Switch Managed	Switches	CDW	3027661	$499.99 (5)	N/A
2	24-Port Patch Panel	Patch Panels (1U)	CDW	713447	$62.99 (4)	N/A
3	An instrument utilized to tighten the end connectors of ethernet cables.	Crimp and Strip Tool	Amazon	ASIN: B0000AZK4G	$16.59	N/A
4	Connectors added to ethernet cables	50 Connectors	Zones	00506365	$8.59 (4)	N/A
5	Standard Cat6 ethernet cable boxes utilized to make connections (in bulk).	1000ft Cat6	CDW	813459	$165.99 (2)	N/A
6	Fiber Optic Cable (Connection w/Switches from D-Mark to Data Center to Service Rooms)	15m (50ft) Fiber Cable (LC)	CDW	518681	$26.99 (20)	N/A
7	Fiber Optic Cable (Connection w/Data Center and Service Rooms)	45.7m (150ft) Fiber Cable (LC)	CDW	502231	$129.99	N/A
8	Network Rack	25U	CDW	3513828	$229.99 (6)	N/A
9	Firewall	1U; Rack-Mountable	CDW	2643207	$3,581.99	N/A
10	Router	Smart Wifi	CDW	3779537	$129.99	N/A
11	SFP Port	10 Gigabit	CDW	4735910	$617.99 (3)	N/A
12	Printer/Copier	Canon Copier	CDW	4112955	$399.00	N/A

Detailed list of software and operating platforms used, including version numbers and licensing requirements:

- Windows 10 Pro (Optional for Computer Installations)

Network diagrams:

- Separate Sheet

Configurations:

- The network infrastructure begins at the room beside the AC Room. In this area, a D-Mark is present giving the entire network its power and connection to the outer world. From this point, the interface is connected directly to the Data Center; the Data Center, then, connects to the two Service Rooms. These connections between Service A, Service B, and the Data Center happen entirely through 3 Duplex LC Fiber Connections. The connections are as follows: D-Mark to the Data Center, Data Center to Service Room A, and Service Room A to Service Room B.
- Inside the Data Center are two 25U Network Racks. These racks allow for future expandability and server storage. On one of the racks is situated a 24-Port Managed Switch that receives the D-Mark connection through the SFP port adapter. Under this particular switch is a firewall connected after the switch that receives the D-Mark and the Service Room A switch. By placing the firewall between Service Room A and the Data Center, all data is filtered and analyzed. The 24-Port Switch in the Data Center connects directly to one of the switches in the Service Room A. This connection happens through fiber and SFP. Inside the Service Room A are two racks, for future upgradability, two 24-Port switches, and two 24-Port Patch Panels. The two switches are situated on a rack; these are daisy chained in order to send connection as a whole. Equally important, the Patch Panels are set in order to establish connections between the workstations (cubicles) and the Service Room A. The switches connect to the two respective Patch Panels, and the Patch Panels connect to the first section of cubicles and wireless access points.
- Cat6 is used for sitewide connections for future proof. Drops are made for the first section (26 workstations) and 2 Wireless Access Points and the Wireless respective Routers. The daisy-chained switches in Service Room A connect directly to one of the Service Room B switches through SFP and Fiber. Service Room B also has two racks, for future upgradability, two 24-Port switches, and two 24-Port Patch Panels. The switches are also daisy-chained, and the patch panels are set as aforementioned. The switches connect to the Patch Panels, and the Patch Panels connect to the workstations. Drops are made for the second section which have the

following: 24 Workstations, 5 Wireless Access Points and the respective routers, and two copier (common area and office). It is important to mention that there are two copiers in the common work area. The first is situated at the far left of the building for the use of those on the left side of the cubicles. The other is situated at the center of the building next to the Data Center. This copier is for the right side; however, the copier next to the Data Center is connected directly from the Data Center through Cat6 and not from the Service Rooms. There are three other copiers located in two other offices and the reception area. These are also connected directly from the data center through Cat6 and not the Service Rooms. The reception area also has a workstation directly connected. Lastly, there are three other Wireless Access Points connected from the Data Center Directly. There is one next to the Waiting Area, one in the Conference Rooms/Showroom, and one in the Sewing Area. These connections are done through horizontal cabling.

- All network drops are made through VLAN connections in order to provide Internet to every computer and telecommunication for voice. Each workstation has its respective telephone for voice. The Internet and the computers are directly connected to the telephones through Daisy-Chain. This requires a single drop which allows efficiency and cleaner drops.
- The AC Room has a new path that is connected directly to the Data Center. The heat is dissipated from one side and expelled to the outside through a pipe that leads beside the offices.