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ISDS409-01

Business Proposal

Dr. Yang

April 27, 2020

Executive Summary

The goal of this Business proposal is to assist Ms. Johnson's landscaping firm in smoothly transitioning to a new office by providing the necessary analysis and design of the new office network. Business needs will be listed and described. The client will be provided with the essential steps that we recommend for meeting the specified business needs. The report will outline and describe topology, hardware, software, and architecture recommendations. The requirements that are listed in the request for proposal will be covered along with additional software and hardware suggestions. One of the hardware suggestions includes the purchase and installation of endpoint security software for each PC for the safety of the client. The client will have a detailed cost assessment of installation costs, initial costs, and maintenance costs for a period of three years. Ms. Johnson's hardware and software requirements are 5 PCs, a laser printer, ethernet cables of a maximum of 300ft to connect all devices, a router, a modem, possibly a switch, Windows OS, and Microsft office. After an appointment for installation has been set and verified, the complete installation and setup process may span over a maximum of three business days.
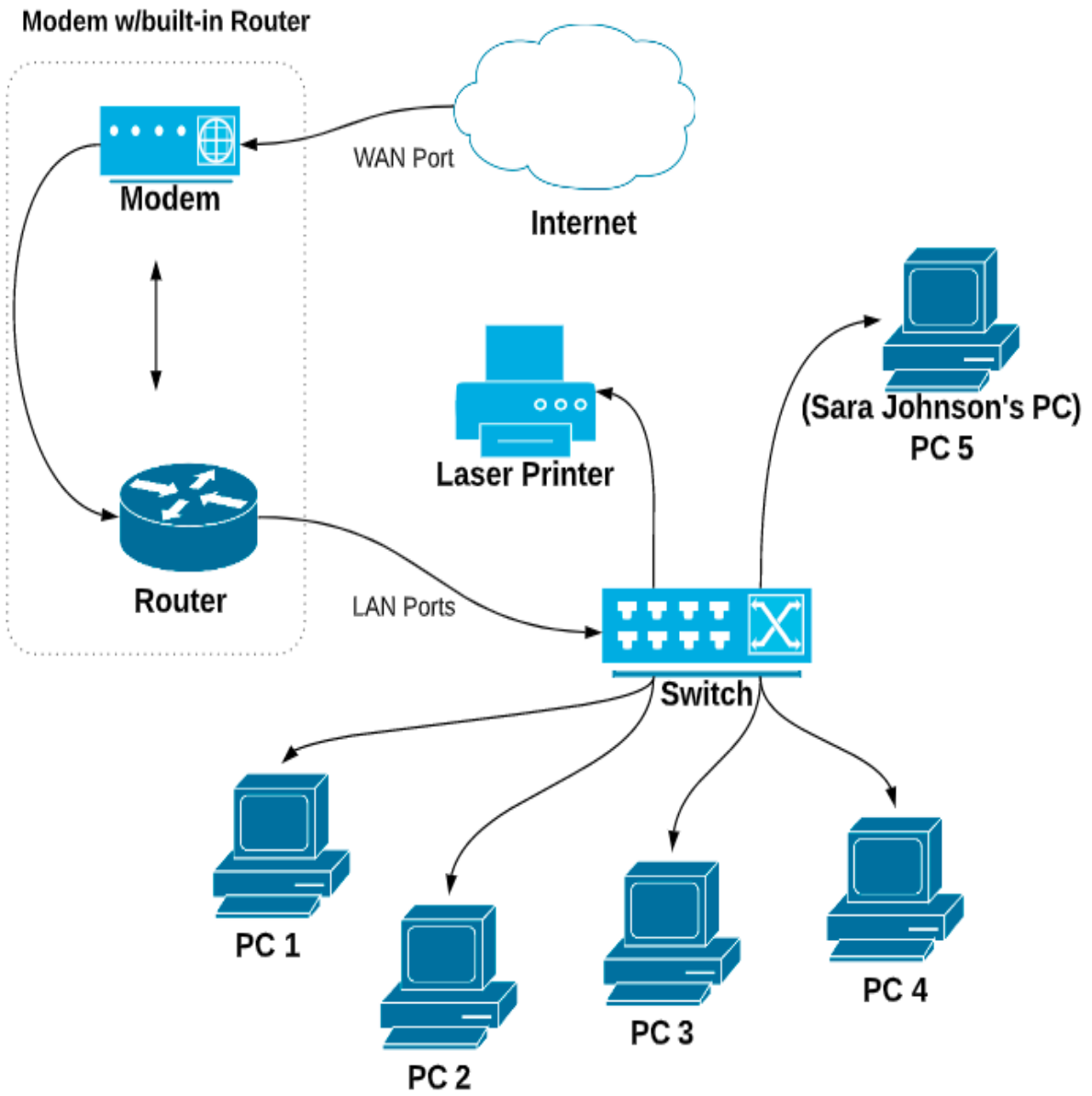
Network Analysis

Needs Analysis

Ms. Johnson wishes to keep AT&T as the internet service provider for her landscaping firm. Some internet service providers grant their members a discounted service cost to install their internet access to a new location because transferring a line from one location to another for an existing customer could cost the customer just as much as signing up with competitors. We have verified with AT&T that the company currently charges a $200 initial set up fee for businesses regardless of being an AT&T member. To access the Internet, we would need an AT&T technician only to install the WAN port to the free modem provided by AT&T, and we will install the rest. The Internet itself is free, but on-ramp (internet service provider) costs money to use to access the Internet. The 100 MBps small business plan from AT&T is recommended; it will be sufficient for many tasks such as video conferencing. Video conferencing with Zoom, as an example, takes approximately 50MBps to have 28 people on it simultaneously, which means that the 100 MBps plan is fast enough. We investigated getting a static IP, but since everything is over the Web and not hosted internally, you don't need to pay AT&T an extra $15 a month for a static IP address. A scheduling system will also be accessed over the Web. No local server is required, as mentioned in the RFP.

Since no wireless connection is needed, it makes it cheaper for the router, but AT&T is providing a router for you in which you can simply turn the Wi-Fi connectivity off. We will be using the AT&T provided device ARRIS NVG510 Gateway, which has the alternative name of Motorola NVG510 Gateway. It's a modem with a built-in router that comes with the contract for free. AT&T will maintain the device and fix any issues if you're faced with any problems with the Gateway. To be protected from hackers and unwelcomed access, the NVG510Gateway has a very basic built-in firewall. Port-forwarding can be set up to allow the unblocking of specific connections.

Logical Network Diagram

Modem w/built-in Router

Modem

WAN Port

Internet

Router

LAN Ports

Laser Printer

(Sara Johnson's PC)
PC 5

Switch

PC 1

PC 2

PC 3

PC 4

The network is set up in a star topology, which allows for simultaneous work, and it won't cause collisions (FitzGerald, J. (2020) p 184). It is better to have the modem, router, and switch made by the same company because companies usually do a system test instead of only doing a unit test. Equipment by the same company will almost be guaranteed to work well. We can assume that the hardware has been tested as a system and that it works well together/ they are compatible. But that is mainly relevant to the modem and router in our case. The NVG510 Gateway will come with a cable from AT&T, and since it is a modem with a built-in router, we only need a total of 7 cables. Cat6 cables are recommended for improved speed, and the price difference between lower performance cables isn't too high. We will make our own Ubigear cat6 cables to customize the lengths, and we will use our crimping tool to connect the rj45 connectors. There will be a need for 14 rj45 connectors out of the 50 pack, and you have the option to keep the rest as spares. The Gateway has 4 LAN ports that can be connected to additional devices (even another switch) for further expansion in the future.

The switch that we recommend is the Linksys 8-Port 10/100/1000 Gigabit Switch. It is backward compatible, which means that it can run with a gigabit inside the company and 100mbgs for the AT&T internet. It is an unmanaged switched; a managed switch would allow adjusting the speed for specific PCs, but it wouldn't be necessary because the internet speed itself is fast enough. Even though a 16-point switch would work, we recommend an 8-point switch because of the additional open ports on the Gateway. There are still enough ports if new employees are hired, and the hardware won't have to be replaced.

The recommended printer is the HP LaserJet Pro M479fdw Wireless Color Laser Multifunction Printer with Duplexing, printers that are more advanced than the M479fdw will most likely end up becoming unnecessary and unutilized resources. The compatible toner is HP 414X Yellow Toner Cartridge, High Yield (W2022X). There are a variety of retailers for this toner. We suggest that you should check for a local retailer that could offer deals for local businesses. But we could also supply the toner upon request.

As seen in the Logical Network Diagram, we have strategically placed miss Johnson's PC in a position that allows her to be close to the printer and to be able to oversee and access her employees. The Dell OptiPlex 3070 Micro comes with a Dell KB522 Business Multimedia Keyboard and a Dell MS116 Wired Mouse, and it is our recommended PC for small businesses. It has 4GB 1X4GB 2666MHz DDR4 Memory and a 2.5" 500GB 7200RPM SATA Hard Disk Drive, which means that it will be strong enough to support any software that the business might use for landscaping.

We highly recommend that each of the PCs have an endpoint security software (Norton anti-virus). But we assume that the client still has their anti-virus software from their previous location because it was not a part of the request for proposal. It is very critical to have an anti-virus software and at least a basic firewall for the safety of your business. The endpoint security software that we recommend for you is Norton anti-virus, and it may be added to the cost assessment upon request. We picked windows professional instead of windows home because windows home doesn't allow you to do all the networking a small business wants. Microsoft Office 365 for business is the suggested software for your business, which is a cloud version and also has Microsoft outlook. Microsoft Outlook could be utilized as a business e-mail provider.

<u>Recommended Hardware</u>

Modem/ Router: ARRIS NVG510 Gateway

Switch: Linksys - 8-Port 10/100/1000 Gigabit Switch

Laser Printer: HP LaserJet Pro M479fdw Wireless Color Laser Printer

PC: Dell OptiPlex 3070 Micro

Wires: UbiGear New 300ft 6Cat Wire

Connectors: CableCreation 50-Pack Cat6 RJ45 Connector Ends

<u>Recommended Software</u>

Office 365 Business

Windows Professional optional upon request (in case if there is no previous subscription)

Norton anti-virus

Technology Design

AT&T Modem w/built-in Router

WAN Port

Internet

ARRIS
NVG510
Gateway

HP LaserJet Pro M479fdw
Color Laser Printer

Dell OptiPlex 3070 Micro
PC

LAN Ports
UbiGear RJ45 CAT6

UbiGear RJ45 CAT6

Linksys LGS108 8-Port
10/100/1000 Gigabit Switch

UbiGear RJ45 CAT6

UbiGear RJ45 CAT6

Dell OptiPlex 3070
Micro PC

Dell OptiPlex 3070
Micro PC

Dell OptiPlex 3070
Micro PC

Dell OptiPlex 3070
Micro PC
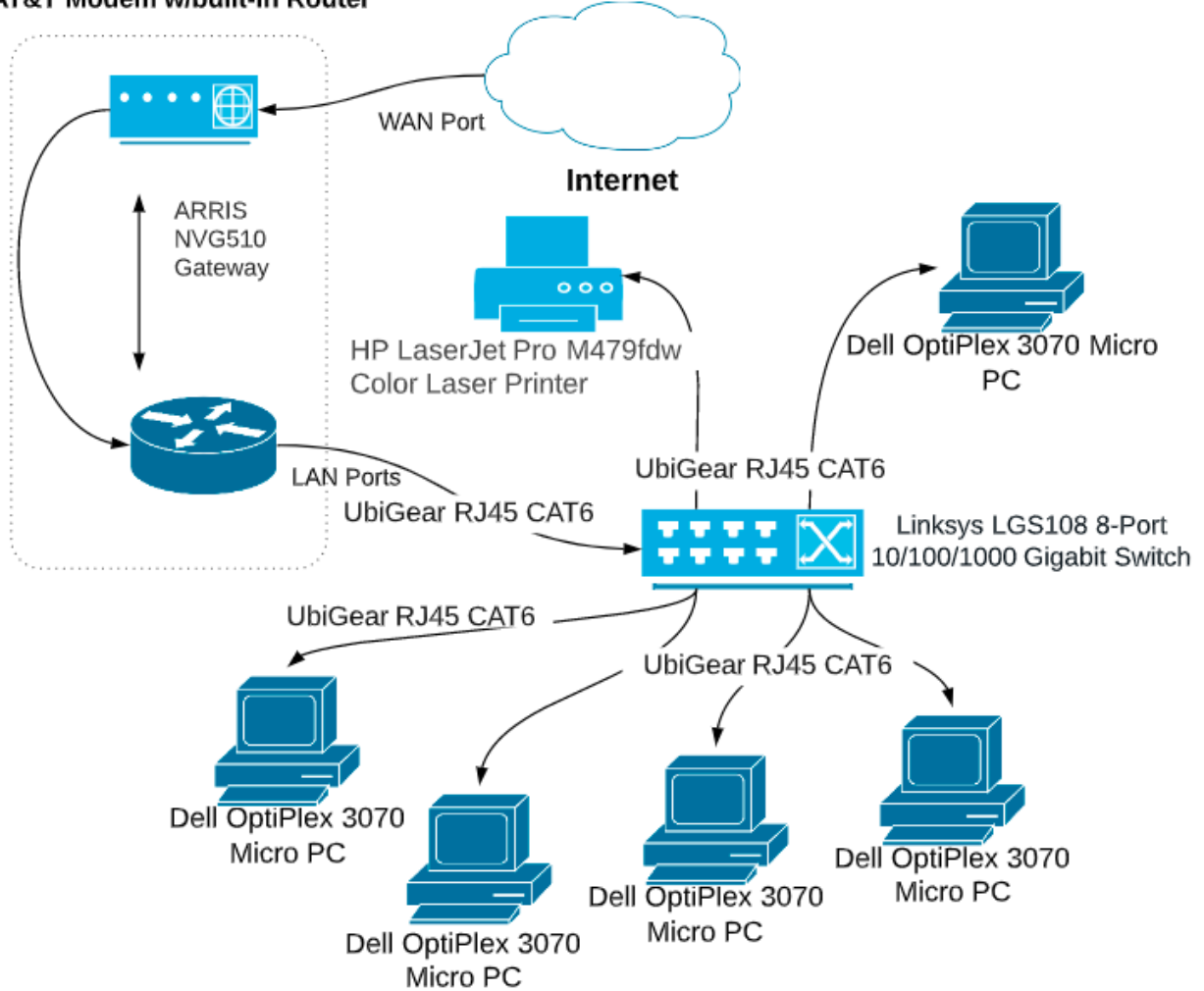
Cost Assessment

The table below shows the <u>operational costs</u> with all taxes and fees included:

	2020	2021	2022	
AT&T Modem/ Router	$0.00	$0.00	$0.00	
AT&T DSL Business Plan 100	$1,980.00	$1,980.00	$1,980.00	
Microsoft Office License	$100.00	$100.00	$100.00	
$180 fees for monthly maintanence	$2,160.00	$2,160.00	$2,160.00	
Total operational cost	$4,240.00	$4,240.00	$4,240.00	Total for 3 years
				$12,720.00

The labor takes the setup time under consideration, making the cables and running them through the building walls to connect them with all the devices to test them. Testing ensures that they will operate in the desired way. We will also be on the property to oversee the AT&T service technician who will install the Arris NVG510 Gateway to verify that the device is tested while being in close communication. This will take approximately 9 hours (9x $300=$2700).

Below is a table that shows the costs with all taxes and fees included:

A9:D20A3A9:D19A9:D21A9:D20A9A9:E19	units	Price	Total
AT&T Set-up Cost			$200
Labor 12 hours *$300			$2,700
Dell OptiPlex 3070 Micro	5	$465.09	$2,325.45
Arris NVG510 Gateway	1	$0	$0
Linksys Linksys - 8-Port 10/100/1000 Gigabit Switch	1		$37.99
UbiGear New 300ft 6Cat Wire	1		$31.97
CableCreation 50-Pack Cat6 RJ45 Connector Ends set of 50	1		$7.99
HP LaserJet Pro M479fdw Wireless Color Laser Printer	1		$399.99
Total Initial Cost			$5,703.39
operational cost+initial cost= $3003.39 + $12720.00 =			
$18,423.39			

Works Cited

(FitzGerald, J. (2020) p 184). Business data communications &networking (13th edition.) Wiley.

Hp Laserjet Pro M479fdw Wireless Color Laser Multifunction Printer with Duplexing (w1a80a)

https://www.staples.com/hp-laserjet-pro-m479fdw-wireless-color-laser-multifunction-printer-with-duplexing-w1a80a/product_24395857?cid=PS%3AGooglePLAs%3A24395857&ci_src=17588969&ci_sku=24395857&KPID=24395857&gclid=EAIaIQobChMI9PW

UbiGear New 300ft Blue RJ45 CAT6 Ethernet LAN Network Internet Computer Solid Wire 23 AWG UTP Cable

https://www.amazon.com/UbiGear-Ethernet-Network-Internet-Computer/dp/B00BNL001Y/ref=sr_1_3?dchild=1&keywords=300+ft+Cat6&qid=1587777667&s=electronics&sr=1-3

Microsoft office 365 business

https://www.microsoft.com/en-us/microsoft-365/business

Cat6 RJ45 Ends, CableCreation 50-Pack Cat6 Connector, Cat6 / Cat5e RJ45 Connector, Ethernet Cable Crimp Connectors UTP Network Plug for Solid Wire and Standard Cable, Transparent

https://www.amazon.com/CableCreation-Connector-Ethernet-Connectors-Transparent/dp/B01K9Z4C3G/ref=sxin_2_ac_d_pm?ac_md=1-0-VW5kZXIgJDEw-ac_d_pm&cv_ct_cx=rj45%2Bconnectors&dchild=1&keywords=rj45%2Bconnectors&pd_rd_i=B01K9Z4C3G&pd_rd_r=b3036341-10bc-413b-be30-9775c460b50f&pd_rd_w=npmyM&pd_rd_wg=7BOtg&pf_rd_p=7be357c2-cef2-4eb3-9062-4babba4026f0&pf_rd_r=NVKQFADN6NHWHESNA3XK&qid=1587777918&s=electronics&sr=1-1-22d05c05-1231-4126-b7c4-3e7a9c0027d0&th=1

Linksys - 8-Port 10/100/1000 Gigabit Switch - Black/Blue

https://www.bestbuy.com/site/linksys-8-port-10-100-1000-gigabit-switch-black-blue/3842019.p?skuId=3842019&ref=212&loc=1&ref=212&loc=1&ds_rl=1268652&gclid=CjwKCAjwnIr1BRAWEiwA6GpwNaDOKorLrJVKBkzYS0-GEefr8cdHS0C0ZcJbxrCoG9wa_TAJA1MWhxoCdZMQAvD_BwE&gclsrc=aw.ds

OptiPlex 3070 Micro with mouse and keyboard included

https://www.dell.com/en-us/work/shop/desktops-all-in-one-pcs/optiplex-3070-micro/spd/optiplex-3070-micro/s001o3070mffus?gacd=9646510-1025-5761040-0-0&dgc=st&=undefined&gclid=EAIaIQobChMIw-LgmoKE6QIVE8RkCh2A2wyZEAkYASABEgIqkPD_BwE&gclsrc=aw.ds&configurationid=7a86d598-7e62-4232-b57e-54e134d6455c

Arris Nvg510

https://www.dslreports.com/hardware/ARRIS-NVG510-h4048