Seven Gunthrope

ABC & XYZ

Network Infrastructure Proposal

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# Seven’s Networking Company

* **Overview**
* My company is focused on providing networking infrastructures to companies that need them at a medium to high range cost while also providing ways where costs could be cut but it would be up to the company’s choice.
* **Mission Statement**
* My company is focused on providing networks to our customers that increase their productivity and convenience when it comes to managing company resources.

# ABC and XYZ Overview

* ABC and XYZ are an auto dealership company that currently has two sites, one in Paterson and another in Wanaque.
* This partnership was formed in 2022 and both partners ran their dealerships independently and shared the risks financially when they occurred.
* Due to this they ran their dealerships separately and both sites have a 5 pc Lan setup. This setup allowed users to access the internet, data and print near their desks.
* The applications that this company uses consist of Microsoft Office 365 apps such as Word, Excel, PowerPoint etc. These applications are up to date.
* They also use QuickBooks for accounting records.

# ABC Organizational Chart

* ABC
* Owner – CEO/CFO
* Sales Department
* 1 Sales Manager and five employees
* Service Department
* 1 Service Manager, six employees
* Parts Department
* 1 Manager, two other workers
* Office Department
* One manager and 3 admin assistants
* Security and Janitors

# XYZ Organizational Chart

* XYZ
* Owner – CEO/CFO
* Sales Department
* 1 Sales Manager and five employees
* Service Department
* 1 Service Manager, six employees
* Parts Department
* 1 Manager, two other workers
* Office Department
* One manager and 3 admin assistants
* Security and Janitors
* It Support Person that works on both sites.

# ABC and XYZ New Direction

* ABC and XYZ have recently bought two new dealerships in East Orange and LODI which will double the size of the auto sales.
* The banks have provided ABC and XYZ with low financing to build a consolidated auto repair facility. The new super servicing facility will be centrally found in Wayne to centralize the parts warehouse, bays, and mechanics.
* The new super servicing facility will also serve as the new company HQ. The HQ will provide centralized administration, reducing the need for individual operations and personnel administration and management.
* A new internet marketing group will be housed in this facility to provide online marketing, sales, and customer services functions.

# ABC and XYZ Problem Definition

* Since a new centralized HQ is being created and they want the systems to be able to be managed from the HQ itself rather than having to go site to site to fix issues for those devices.
* Not only that but they have low funding, so it must be a lower cost method that the company will be able to buy.
* Not only that but we also must incorporate a fresh marketing group into our plan to be able to manage it as well.

# ABC & XYZ Current Network Infrastructure

Now ABC & XYZ current network infrastructure consists of a 5 pc Lan setup this is of course used to access the internet, data, and printing services.

# ABC & XYZ Current Infrastructure Issues

Of course, since ABC and XYZ intends to create three new dealership sites 5 pc Lan setup will not work of course due to its limited range only being available to one small area of course as the company is planning to expand a single Lan for both dealerships will not be efficient especially when they want operations to be more centralized.

# ABC & XYZ Current Configuration Sample Diagram

A diagram of a cloud computing network

Description automatically generated

# Proposed Plan Overview

* For this project I want to incorporate Active Directory on-premises and include all the dealerships in one domain however separate them by configuring domain controllers to multiple sites and using Ous.
* For our applications such as Microsoft 365 alongside our on-premises ad I want to implement Azure AD the reasoning is because we can use it to preinstall 365 applications to the devices in our domain not only that, but we can apply single sign on which allows all apps to be signed in via one credential.
* Azure AD is like Active Directory. However, the differences are in how its hosted Ad is a directory service that is on premises while Azure AD uses to, he clouds which is why office 365 can use single sign on.
* These two services can be implemented into each other allowing us to not only manage our employees and devices but our applications as well.
* When it comes to storing our data, however with databases, QuickBooks and 365 I want to set up a file server this way everyone can access certain folders that they need.

# Proposed Physical Network Infrastructure for branch offices.

A diagram of a computer network

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# Hardware and Network Devices

* To start off we first need an internet connection, we get this through an isp like Verizon, Optimum etc.
* For our ISP we are deciding to go with Verizon and our plan for our HQ we want 50 Mbps for 200$ the reasoning for this is because the internet online marketing group is providing customer service support and online marketing sales which means quick responses are essential which means we will need faster speeds for customer service to be good.
* Now next after we get our modem, we want a router the one that will be best here is the Cisco RV340 VPN router which costs 390$ we need five of these for each site the reason I want to go with this router is because it allows us to set up site-to-site vpns connecting our sites and allowing our users to be able to share information between each other safely with encryption.
* Lastly, we want switches the reason for switches is to allow us to connect multiple desktops and our printer to the network for our switch we want to go with the NETGEAR 8 Port PoE switch this switch gives us 8 rj45 ports which gives room to connect our printer alongside network cameras for security purposes at HQ and branch offices will have two other ports in implement new devices.
* Now that we have the hardware for our network, we need to go over the hardware and software needed to implement our network. To start this off we need around thirty computers and five printers.
* The reasoning for me choosing thirty computers Is so we can have five for each site and an additional five for our marketing dept because as stated before they used 5 pc Lan setup, and it worked flawlessly which means that having 10 workstations per site will be overkill since the computers will not be heavily used.
* For our computer choice I want to go with the Lenovo ThinkCentre M625q Mini Form factor business desktop the reason I went with this computer is because it provides us enough performance to use applications such as 365 and QuickBooks with good performance and it comes with windows 10 pro which will allow us to connect our devices to the domain vs the home edition
* We will also need monitors as well since this is a desktop and for those, we can go with the HP V22v G5, it is a cheaper monitor but provides us with 1080p resolution and sixty hz, which is well enough for our tasks.
* Next on the hardware list is our printers we need 5 printers one for each site before each individual person was able to have their own printer but to save on cost if eel as though one shared multipurpose printer would be way cheaper and more efficient or for that reason, I want to go with HP LaserJet Pro MFP 4101fdn which cost roughly 339$.
* Lastly, now that we have other devices that can join the domain this is where we set up our server's desktop computers and our file server storage.
* For our domain controllers I want to use the same computers as we listed earlier because we will only be using it as a domain controller which means that the hardware needed for it does not have to be great, however in order to do this we need to purchase windows server 2022 standard this is because we will be mixing in physical and virtual environments that I will explain in more detail.
* Windows Server 2022 Standard is 1070$ and we will want around 4.
* File Server, and three domain controllers.
* The reasoning is for fault tolerance and updates.
* However, the change here is I want to implement them using virtual machines Hyper V the reasoning for this is because of backups using snapshots which makes reverting extremely easy because of this I would like to set up a raid 1 mirror set using two ssds Samsung Electronics 870 EVO 2TB that cost 254$ each while using the 512 drive that comes inside the system, we can also look at internal hard drives for more storage and less price dell has a 4tb 3,5 hard drive that uses sata as it interface and has transfer has speeds of 6gbs we can get two of these for 65.00 and set up our mirror 1 set.
* The reason where going with Hyper-V is because it comes with our Server OS and allows us to lessen the cost in that area.
* Now for our file server I want to go with a raid 5 set because I would like the option to recover our data since the files here are mostly going to be databases and private personal / company records.
* Here I would like enormous amounts of space simply because the length of the database will get long so I think around 24 tb should be enough. Here for our SSD drives how I want to set up this array is with SAMSUNG 870 QVO SATA III SSD 8TB.
* Parity or Raid 5 needs a minimum of three disks which means we need to connect three ssds to our system and I do not want to incorporate our OS in the raid array simply due to the chance of the array failing when we lose two disks.
* The reason why I went with this array is because using parity no single disk can be bottlenecked and most importantly it allows for data reconstruction however if two drives fail, we will still lose our data I would rather take that chance then not being able to reconstruct our data because our records are incredibly important.
* Another thing that needs to be incorporated is a dns server. The reason for this is this is critical for domains to be set up it allows or clients to log in , Dcs to replicate changes and communicate with each other etc.
* Lastly, I want to incorporate backup power solutions for our services this critical data is not lost in case of power outages and the one I went with is CyberPower CP1500AVRLCD3 Intelligent LCD UPS which is 190 dollars, and we need three one for the file server and two for our DCs.

# Implementation

* First, we need to configure our routers for site-to-site vpns now for all of our offices including our HQ we need Ip addresses for our IP addresses I want to use class c IPV4 addresses a ipv4 address consist of a network id and a host id the host id is 254 which means only 254 devices will be able to connect to other network and this is more than enough since we have 5 computers and one printer at each site and even if we allow our employees to connect to our router it will still be more than enough.
* We will be using our router as our dhcp server for each site but for HQ we will we be:
* Supplying addresses through the ranges of 192.168.0.1 to 192.168.0.15
* 192.168.0.3 will be reserved for our file server.
* 192.168.0.1 will be reserved for our Global Catalog
* 192.168.0.2 will be reserved for our second domain controller.
* 192.168.0.4 will be reserved for our third domain controller.
* Lastly 192.168.0.5 will be reserved for our HQ network printer.
* For our branch offices I also want to use class c addresses across all sites since most sites:
* The Ips for all branch sites will range from 192.168 to 223.255. Once we have that configured, we will set up our site-to-site connections via the cisco routers.
* The reason we want to implement site-to-site vpns is because it keeps our data that is transferred between sites encrypted without the need of credentials.
* We are implementing it on our routers because I want all the devices to be able to communicate with each other from our servers to our computers to our printers. Based on this connection someone in Paterson can print to Wanaque things like that.
* The reason for this is to give us the ability to manage tasks in an efficient manner and speed up production,

# Example Wan Diagram

This is an example of how the wan connection will work:

1. Employees at pc1 or pc2 need to get a company record from hq
2. Employees sign into either workstation or access the file server which is in HQ.
3. Employees access the file.

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# Timetable for duration of implementation.

|  |  |
| --- | --- |
| Networking Configuration for HQ and branch sites and testing | 4 days |
| Vpns setup and testing | 2 days |
| Domain setup and Configuration and testing with Ad on prem and Azure | 4 days |
| File server set up | 3 days |
| Testing analysis and completion | 2 days |

# Domain Structure Example

A diagram of a company

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# Security Policy Configurations

* Now first off, we want to protect our physical host that is being used for our virtual machines. The only people here that should have access to it are network admins and the support person that works at both sites.
* We can secure this by using network cameras that oversee the inside of the server room and not only, but the door should be locked with a key that is held only by the CEO and network admins the network camera that we want should be place in the hallway of the server room, inside the server room and monitored regularly by the security team across all sites,
* The Security Cameras we are going with REOLINK 8CH 5MP Home Surveillance & Security Camera System. The reason we are going with this is it provides us with 2tb of storage for longer video recording sessions and comes with four cameras.
* Now first up I would like for us to set up a hardware firewall between our router and switch and for this I want to implement Fortinet FortiGate 60F Firewall the reason for this is because it gives us gateway antivirus which can be used to make sure attackers are not sending us malicious packets from our computers.
* Not only that, but it also provides us with Intrusion prevention services which allow us to detect network attacks which allows us to safeguard our systems further.
* Now I want to configure firewalls on the software side for our domain controllers and File servers.
* When it comes to our domain controllers' ports, we want to block completely are port 3389 port 80 and 443 ports this is because number one 3389 we will not be using remote desktop services and port 80 and 443 will not be used as well since we do not want our domain controllers to be accepting web request at all.
* Also, on our file server we want to install alongside its SMB encryption. The reason is because this offers encryption from end-to-end data transfers which means when data is transferred between sites it is encrypted.
* Now for policies first I want to start with application polices for our employee computer users I do not want them to have access to disk management or the control panel, command prompt or windows PowerShell simply because these applications can potentially cause vast amounts of harm.
* Next for our password and account policies we tell the system to enforce password history users will not be able to use the same three passwords this way we can enforce security while also not making it too annoying to switch passwords. Next the maximum password age that we will allow is 45 days, this way users do not have to change passwords every month but will need to at the beginning of the next month. Lastly the minimum length for passwords that we will allow will be eight; that way passwords will not be too easy to guess or figure out.
* Also, we want to incorporate vulnerability scanning with Nessus the reason I want to go with Nessus is because it allows us to scan anywhere and use cloud infrastructure scans which can be used for our azure ad and in the future if a more cloud-based infrastructure is implemented we have security ready to go immediately.

# Folder Permissions

* As we said before this dealership has company records on an access database, so when we incorporate our folders, we want only our all our groups to see this as company records hold sensitive data that employees will need to access however when it comes to our service parts and office groups, we want them to only be able to read the records the people who should be allowed to edit and write the records should be our CEO / CFO.
* With accounting records this should only be able to be viewed by our CEO/CFO and our marketing department, however our CFO should have written permissions to access and write in data for the financial statistics.
* Lastly on this folder share we will have our inventory of parts which everyone can access, especially HQ. The only people who will not have access is the internet marketing group, since CFO may need this to determine financials as well.
* All Folder shares will be hidden from the employees’ groups that do not need them using, for example $Inventory will be hidden from marketing and the CFO while it will be visible for the Parts and Services Groups.

# Hardware/Software Table Totals

|  |  |  |
| --- | --- | --- |
| Device/Service | Quantity | Totals |
| Verizon Business Internet | 5 | 200$ |
| Cisco RV340 VPN Router | 5 | 1950$ |
| NetGear 8 Port POE | 6 | 450$ |
| Think System ST250 V2 | 2 | 2490.54$ |
| Lenovo ThinkCentre M625q | 34 | 9826$ |
| HP V22v G5 | 34 | 2210$ |
| HP LaserJet Pro MFP 4101fdn | 5 | 1645$ |
| QuickBooks Online | 1 | 100$ monthly |
| Microsoft 365 / Azure | 1 | 132$ monthly |
| SAMSUNG 870 QVO SATA III SSD 8TB | 3 | 2442$ |
| Samsung Electronics 870 EVO 2TB | 6 | 1524$ |
| Windows Server 2022 | 4 | 4280$ |
| Fortinet FortiGate 60F Firewall | 5 | 18,181$ |
| REOLINK 8CH 5MP Home Surveillance & Security Camera System | 1 | 300$ |
| CyberPower CP1500AVRLCD3 Intelligent LCD UPS | 3 | 570$ |
| One time Purchase total (Desktops, OS licenses etc.) |  | 46068.54$ |
| Monthly Cost Total (Azure, QuickBooks) |  | 432$ |

# Losses and Overview

* Now due to this project implementation the sites will have to be closed down for at least 15 days however since these previous two dealerships will are already on their standalone network they can operate operations as normal until our HQ and Branch offices are set up once they are ready to go profits should increase two times the current amount the reasoning is because with this infrastructure It will allow for our users to send files across a secured network with ease which will allow the dealerships to communicate effectively.