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**Introduction & Background**

This small business has issued a request of proposal for a peer-to-peer network that satisfies the following requirements:

* Able to connect 14 clients to a single local area network
* The clients must utilize the Windows 10 operating system
* The clients must have access to software that specializes in sales, inventory control, accounting, and payroll.

It must be noted that employees are all performing different tasks; thus, the clients must be configured to assist in their job.

**Contextual Information**

Firstly, how the clients will be physically connected must be defined. Therefore, the network administrator must determine the best topology that must be used. Here are three topologies that could be used:

1. Bus topology: All fourteen clients will be connected to a single cable.
2. Ring Topology: The clients are connected in a circular manner.
3. Star topology: The clients are connected to a central node.

Then, the network admin must determine the physical medium used to connect the computers. Here are some examples:

1. Unshielded/Shield Twisted Pair Cables
2. Coaxial Cables
3. Fiber Optic Cables

After the connection is in place, we must determine the appropriate version of Windows 10. Only two options are viable for a business. Those versions are Windows 10 Pro and Windows 10 Enterprise. Microsoft states that Windows Pro offers everything as the basic version of Windows 10 and adds features so that a business can better manage their devices and sensitive data. Windows 10 Enterprise has the same offering of Windows Pro with enhanced security features (Prophet, 2015).

Lastly, what type of software utilized must be determined mainly in terms of having it locally installed or using a cloud service. Using a cloud service to access software means that a cloud service provider offers software to the user. Thus, the software itself is not installed in the computer itself.

**Findings**

Here are the finds of each topology:

* Bus Topology: May cause data to collide with each other because all the data packets are sent through a single straight path. It is also not very fault-tolerant because the whole network will fail if one segment of the network is broken.
* Ring Topology: Will does not cause data collusion because the data is transferred in a circular manner, meaning that data packets are traveling in a synchronized manner. It is still not fault-tolerant because the network will still go done if one segment is broken.
* Star Topology: Will does not cause data to collide with each other because all clients have an individual connection to the central node. The network will be fault-tolerant because if one segment is broken, only one client will be affected, not the whole network.

In terms of the physical medium, twisted pair cables are specifically designed for connecting computers together. Unshielded Twisted Pair Cables are cheaper and easier to install, but they more affected by electromagnetic interference (EMI). Shielded Pair Cables are more expensive and harder to install but are more resistant to EMI.

Windows 10 Pro are best suited for small to medium businesses, whereas larger companies use windows 10 Enterprise.

If the company decides to install software locally, they will have the software even when the network is done. However, this will take up space on the computer, making them thick clients. Conversely, the user will not have to waste computer resources on the software. However, availability is dependent on the network and the cloud service provider. Moreover, maintenance and updates are done based on the discretion of the cloud service provider.

**Recommendations**

Physical Hardware:

In terms of the physical medium, I strongly recommend that Cat 5e UTP Ethernet cables with RJ-45 connection are used. Category 5e cables will ensure that the company has the data throughput to satisfy their business need. Using UTP cables will better allow the company to manage cost and physical installation. RJ-45 will allow the company to connect the computer with the router easily.

Installation:

To install the network, simply connect all 14 clients to a central hub, this will most likely be the office’s router. Then you assign each computer a name, which follows a unified naming convention. Each employee will have their user and password. The next step is to create a workgroup and assign each user to that workgroup. To add the user, you must make sure that the IP address of each computer is configured. You will enter the IP address of the client, the default router, and the Subnet Mask. If all steps are done correctly, then the local network is established.

Operating System:

The business should use the Windows 10 Pro operating system because they are a small business. Therefore, I do not believe the company must buy the licenses of Windows 10 Enterprise for 14 clients. However, the company must be mindful that Windows 10 Pro does not offer the same level of protection as Windows 10 Enterprise.

Software:

Due to the diverse range of services offered by the company, I recommend that the company locally install some software and use a cloud provider for the others. Here are some examples:

* Sales: Salesforce is effective and easy to use client relations management software.
* Inventory control: SAP offers a great inventory management solution within its application suite. However, it might be too expansive for a small business.
* Accounting: QuickBooks can be installed locally and is very popular and easy to use
* payroll/HR: Paycom can be locally installed on the employees ’devices. Gusto is a cloud-based payroll software that is specialized for small businesses.

**Conclusion**

Overall, these recommendations highlight the importance of the affordability and effectiveness of the network. The network configuration will ensure that the LAN is easy to install and manage. This effective peer-to-peer network will improve the business operation of this small company.

**References**

Prophet, T. (2015, May 13). *Windows Blogs.* Retrieved from Microsoft: https://blogs.windows.com/windowsexperience/2015/05/13/introducing-windows-10-editions/