Unit 7 21st Century Upgrades

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**Network Architecture**

* There are many types of networks. PAN, LAN, HAN, MAN, or WAN can get pretty confusing pretty fast without the proper knowledge. Thankfully, they aren’t nearly as scary to break down once you get going.
  + **PAN, or Personal Area Network, is a more personal network centered around the devices a user directly uses in day-to-day operations.** As an example, PAN can have a laptop, printer, and cellphone connected all at the same time (Rouse, 2007). **LAN, or Local Area Network, could have several different devices all connected at once used by a group of individuals**. An example of this could be a group of friends bring gaming consoles or computers to one house, and set up a private lobby when connected to the same network. Due to the local nature of this network, people from the outside can’t intrude unless connected to that same network (Rouse, 2007).
  + **HAN, or Home Area Network, is similar to a LAN, though it more deals with connecting a much wider range of devices to the internet.** This is still a closed network, much like a LAN connection (Satyabrata, 2020). An example would be connections between a router, a PC, a smart TV, a Google Home, and other quality-of-life devices.
  + **A MAN, or Metropolitan Area Network, is a network used to facilitate the connection of multiple LAN’s (Cloud Flare, 2021).** An example of such a network could be an apartment complex or housing group.
  + **On the largest scale, we have WAN’s, or Wide Area Networks. These are large-scale networks that could connect devices from one spot of the globe to another (CompTIA, 2021).** These are used by companies like Comcast to connect customers to their services. All these connections can vary in style, however. No matter what connection you have and what you’re trying to do, you need a host.
* **In a peer-to-peer connection, the host is the end-user, that connects to many different users to form a connection**. This is much cheaper to manufacture and puts the stress off of the company making the service. This is commonly seen in multiplayer games in that each lobby formed is hosted by a member trying to play the game. The main drawback of this system is the lack of reliability. Since the host is not definite, all of the other peers of that host need to rely on the host’s internet connection. If it is a poor or slow connection, this will be felt by everyone on the server. If the host disconnects, the risk is run that each of the people on that service will be forced out unless the host is migrated.
* **These problems can be overrun by incorporating client-to-server connections.** This way there is a definite host that the service provider can control. The end-user doesn’t need to rely on a spotty connection, and will have access to the service for as long as the servers are running; not just if one user disconnects. Due to the need for manufactured servers, this method of connection can be extremely difficult and costly to run.

**Transmission Media**

* There is a multitude of ways to have one device communicate with another. From cloud storage to USB’s, no matter what you want to get from one device to another, odds are that you can get it there. The methods of delivery can be incredibly dependent on what exactly you’re transmitting, though.
* **Many forms of data can be transmitted wirelessly** such as documents, pictures, driver instruction sets, and more small-scale packets. **If your deliveries are more massive in scale or timing is crucial, you may consider a wired connection.** These ensure that no data is lost from one end to the other, and are much faster at transferring data when compared to its wireless competitor. These are most commonly in the form of an Ethernet cable, though you can also use Fiber Optic solutions should your business need to upgrade. Fiber Optic is multitudes faster than traditional Ethernet, but much more costly, and not to mention that your store would see no added benefit due to the slower download and upload speed provided by your ISP.
* **Because of this, there is no real one-size-fits-all connection and transfer method.** For devices that require a stable internet connection such as your point of sale and office computer, I would recommend running an ethernet cable from your router to the device should it have the ports available. For other devices such as on-screen entertainment in the lobby, or mobile devices, a wireless connection should be adequate. This can be easily managed by connecting devices to the router via the Wi-Fi network.

**Network Hardware**

* It has come to my attention that your ISP has provided you with a modem. We will not need to change the modem given to you, simply because it will achieve the speeds you will be getting from your internet plan, or else they wouldn’t have given it to you. Should you upgrade your plan, I would recommend contacting your provider to make sure your current modem will be compatible with your new speeds.
* The main hardware requirement would be a router. A router will connect devices to a wireless network, as well as serve as an access point to interface via Ethernet. The network area that you have chosen may be particularly challenging for wireless networks due to the configuration needing to access multiple rooms with a single access point. Current generational leaps in internet technology will make this task much easier than it had been in the years prior, however. The new standard of **Wi-Fi 6** is even better at protruding through walls, and reach larger spaces. When paired with a router capable of **beamforming**, this can prove to effectively mitigate the loss that occurs with obstacles like walls and furniture. The way beamforming can do this is due to the technology casting signals in a specific direction to determine the most optimal path to the device. A decent router that checks all those boxes is the **Asus RT-AX86U AX5700**. This router will be excellent to reach challenging places such as behind the sales counter, and rooms across the house no matter where you put it.

**Network Security and Data Backup**

* Due to the storage needs of the shop including information like customer names and addresses, we will not need a particularly large space. **This simply can be a text file on a computer. Some POS services may come with settings to export saved information directly to a connected drive in the form of a TXT file**. If you have this option on your system, it may prove useful. It is recommended to store this information on its drive to guarantee an amount of space, and easily determine if it will fill, or how much more storage you need.
* **It is also possible to use a service like OneDrive or Google Drive to keep the file backed up onto the cloud**. Storing contents online can be a very effective solution to ensure if something happens to the shop such as flooding or burglary, your data will still be available despite what may happen to your computer.
* **This also does come with security risks, however**. Being hosted remotely means if something happens to where another person acquires your credentials or the service hosting platform gets leaked, your data could fall into the hands of unsavory individuals. To protect against this, you can use software solutions like Norton to monitor the web to search for places your data may leak to, and help protect against it leaking in the future. Investing in privacy support now will greatly impact your clientele trust in the future, and build your business’s reputation overall.

# **References**

Cloud Flare. (2021, January 24). *What is a metropolitan area network (MAN)?* Retrieved from CloudFlare: https://www.cloudflare.com/learning/network-layer/what-is-a-metropolitan-area-network/

CompTIA. (2021, January 24). *What Is WAN? How Wide Area Networks Function*. Retrieved from CompTIA.org: https://www.comptia.org/content/guides/what-is-a-wide-area-network

Rouse, M. (2007, May). *Personal Area Network (PAN)*. Retrieved from TechTarget: https://searchmobilecomputing.techtarget.com/definition/personal-area-network

Satyabrata, J. (2020, July 29). *Introduction of Home Area Network (HAN)*. Retrieved from Geeks for Geeks: https://www.geeksforgeeks.org/introduction-of-home-area-network-han/