

Report on Lan Topology for Fayetteville NC Project

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We're excited to announce our expansion into Fayetteville, North Carolina! Our new office will be staffed by fifty employees, including our new Executive Vice President of Sales and Marketing. To ensure a successful launch, we need to set up our new location for optimal performance from day one. This includes establishing reliable internet with sufficient bandwidth for all staff and teleconferencing needs as well as a robust network infrastructure, including switches, firewalls, computers, and cabling, to ensure seamless operations and maintain data security. We will also need to carefully consider our budget and the distance from our home office.

To ensure a successful launch and future scalability, getting our IT infrastructure right from the start is crucial, saving both time and money. Our staff will primarily use laptop computers, necessitating docking stations for reliable hard-wired network connectivity. For network traffic management, we will require switches. Understanding the OSI (Open Systems Interconnection) model is key here. The OSI model provides a standardized framework for network communication, making troubleshooting more efficient. Layer 2, the data link layer, switches are designed for relaying information within a local network, based on MAC addresses. Layer 3, the network layer, devices, like routers, handle data transmission across different networks using IP addresses. I recommend implementing Layer 3 switches. These devices combine the functionality of both Layer 2 switching for local traffic and Layer 3 routing for inter-network communication, offering a more integrated and efficient solution. To secure our data, we will employ a multi-layered approach. A network firewall will protect the overall office network, while each laptop will have antivirus and firewall protection installed on it.

Implementing domain logins will also enhance security by allowing centralized control and enabling remote lockdown or data wiping if a laptop is compromised or stolen.

To handle our daily internet traffic, teleconferencing needs, and VPN tunneling back to the Albany office, we'll need a fiber internet connection. Fiber offers substantial bandwidth and high reliability, ensuring we're always connected. A site-to-site VPN will also be crucial for seamless connection to our home office, enabling file sharing and printing between locations.

This project comes with two main constraints budget and distance. We need to be mindful of spending, making wise decisions like purchasing reasonably priced computers and potentially recycling unused equipment from other offices. We'll also get competitive bids from contractors to ensure cost-effectiveness as far as distance goes, Fayetteville is about 700 miles from Albany, which presents challenges for centralized IT support, meetings, and other office functions. While VPN tunneling will connect our networks, the significant distance could still impact performance and communication.

When it comes to network topology, several options exist. One type is the tree topology. This type is easily scalable and allows for growth and expansion. The con to this type is that it can get complex the larger it grows and if there is a failure near the top it can put several other computers out of service as well. Another type of topology is the star type. With this type each computer has a direct connection to the server. This means if one line goes down it won't affect other computers, which makes troubleshooting easier. However, running all the cable makes this type cost more than other topologies. For our office I would recommend the star topology. While it might require more cabling and potentially more switches, the increased reliability and easier problem isolation make it the best choice for us, minimizing catastrophic failures. With this topology we will have a centralized switch or maybe switches and then we will run ethernet

cables to each workstation and needed location throughout the office suite. By having a standardized labeling system we will be able to identify any problems that occur and either make repairs or move that workstation to another branch and get them up and running quickly.

As for our IP addressing, we'll use a Class C range (192.168.0.0 to 192.168.255.255). This range provides ample IP addresses for our current needs and allows for future expansion without issue, especially by utilizing private IP addresses with public router addresses.