Assignment 15.1: Network Design Evaluation and Final Project

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NTW 275 - Network Infrastructure

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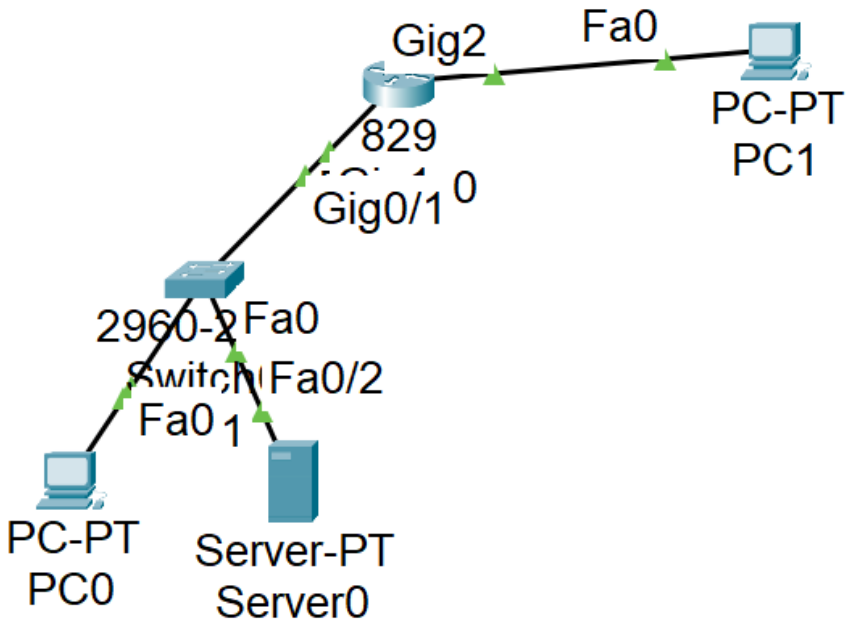
1. Screenshots



a.

2. What is the scope?

a. The Screenshot above is from the 3.1 assignment, Access Control and NAT. In that assignment, we configured Network Address Translation to allow all devices on the network to work under one public IP address. We also configured Access groups, which control the flow of traffic by

applying access control lists to interfaces. The ACLs defined rules that block or allow traffic based on source and necessity. Based on this, the scope should be focused on furthering the security of the network and creating a more scalable network. In terms of cost, an office setup like this is typically around $500-$3,500 based on the quality of the network devices and computers.

3. Security Improvements

a. Security could be improved in a few ways. To start, a firewall could be constructed for all traffic going inside and outside the network. This can be easily done by setting up an ASA 5506-X VPN and firewall. This will create a clientless VPN so users can access the network devices remotely with having to install any VPNs outside the network. It also funnels most of the traffic through a controlled and heavily monitored VPN service which can be manipulated based on what is needed. Furthermore, this increases accessibility as anyone who is authorized to use the network can log into a website and temporarily access the computers. This along with the ACL should inhibit malicious actors from access the network from outside the VPN

4. Scalability improvements

a. There are alot of options for scaling a network. For a cisco router setup, hierarchical IP addressing schemes were the first step. Hierarchical IP addressing is a structured approach to assigning IP addresses within a network. This method significantly enhances network scalability by

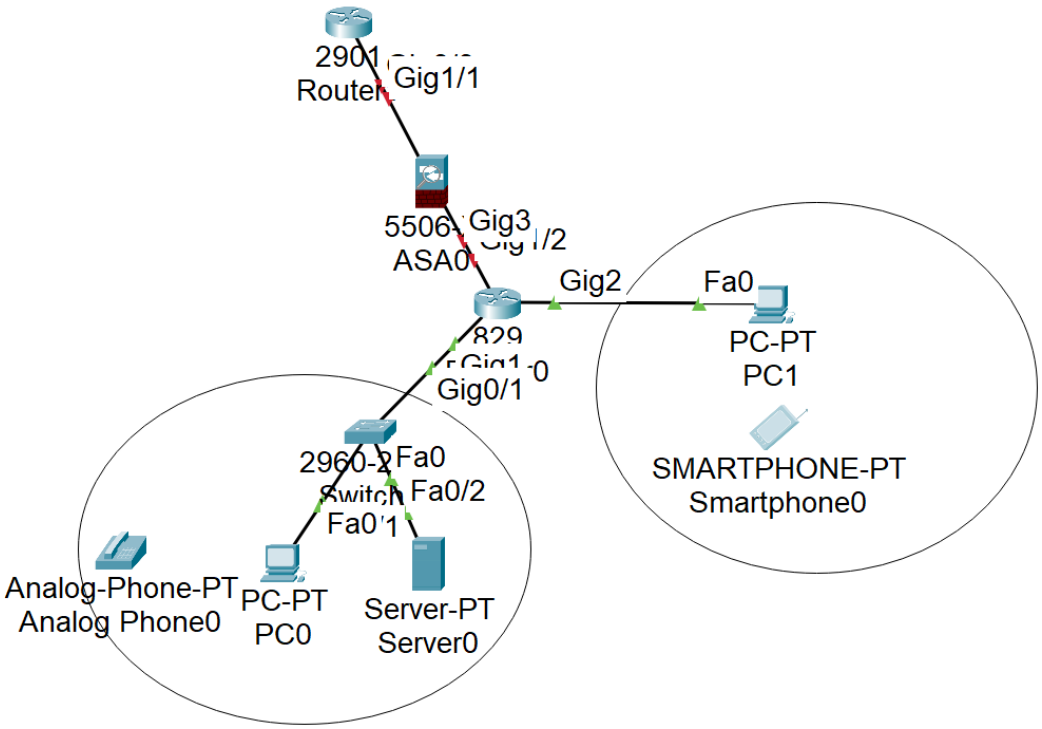
simplifying management, reducing the routing table sizes, and making network expansion easier as IP can be immediately assigned without hassle. To expand this network, it's important to assign the devices. For the sake of expanding the network, lets say PC0 is office 1 and PC1 is Office two. Office one gets a 192.168.2.0/16 IP range and office two gets a 192.168.3.0/16 IP range. Once those are assigned, we can subdivide the offices. Office one can be the IP range 192.168.2.1-192.168.2.5 to facilitate all the computers. For servers, 192.168.2.6-192.168.2.10 can be assigned. The same can be done with office two with an IP range of 192.168.3.1-192.168.3.5 for computers and 192.168.3.6-192.168.3.10 for servers. This can be done for IoT devices as well by simply assigning a range of IPs for IoT devices. By subdividing the network, it simplifies the network management, makes troubleshooting easier, improves network performance, and allows for more expansion through more subdividing.

5. What is the cost?

a. The cost of an upgrade depends on the quality of the devices and the expertise of employees. To start, the quality of the PCs, servers, routers, and IoT devices matters. Based on the budget, office expansion could cost around $1,000 to $4,000 per office space. For example, if you needed to buy a landline phone, low-quality PC setup, small printer, clock, and headset for an office desk; the cost would be around $1,050 for material and about 10 hours worth of labor. For a personal phone, medium quality PC setup, printer, clock, and headset; the cost would be around $4,250 to

$4,500. Despite the higher cost there wouldn't be as much labor, with around 5 hours spent on connecting the PC and printer. To properly set up a hierarchical IP addressing scheme and clientless VPN, the office would need a skilled administrator. It isn't a hard task to set up a clientless VPN and IP scheme, but it takes time to troubleshoot and ensure everything is set up properly. The cost of labor would likely be around $500 as the starting network is smaller and doesn't have as many devices yet.

6. Network map



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