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7COM1029 – Network Systems Administration

Task 2 – Justification of the Design

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In my design, I have decided to use different networking devices. I am going to support why I have decided to use them. On each site, there are several devices which I have used. I will start with the Primary Site in explaining the number of devices I have used and how they meet the requirements. I have used the following devices in the design

Primary Site

* Cisco Router – 2911
* Cisco Router – 1941
* 2X Switches – 3560
* 2X Switches – 2960
* ASA Firewall – 5505
* DNS Server
* Backup Server
* FTP Server
* Linux Server
* Print Server
* 15X PCs (Workstations)
* Cross Over Cables
* Straight Through Cables

Having considered all the specifications, my design has met them. In the access layer, I have used two 24 port switches in this case I have used the layer 2 switches (2960). According to the document requirements, at least 15 workstations are to be used and I have used exactly that. And I have used one office as the comms room where I put my networking devices and then the next office with the rack of servers which is office 2. There is also a need to put FTP Server, DNS Server, Backup, Linux and Print Server which I have put in a rack in the Second Office. They are all connected to the 24-port switch using the copper straight-through cable.

In the distribution layer, I have used two 3560 Layer 3 Distribution switches which are all connected to the two 24 port switches and the main router. The requirement specifies that we at least use one layer 3 switch and I have used two of them with backup links. Then I used the main router which serves as the DHCP, and it is connected to one of the two switches, which is in the core layer. I have connected the Main router 2911 cisco router to the border router using the cross-over cable and the border router serves as the edge of the network which connects the primary and secondary sites via the ISP. The border router which is connected to the main DHCP is also connected to the ASA 5505 Firewall. And both of them are acting as layers of security.

Secondary Site

* Cisco Router – 2911
* Cisco Router – 1941
* 1X Switch – 3560
* 2X Switches – 2960
* ASA Firewall – 5505
* Print Server
* 6X PCs (Workstations)
* Cross Over Cables
* Straight Through

My design in the secondary has been almost similar to the main site as I have also gone on to use the design structure of the hierarchical networking model. I have used 6 workstations which are located in each office as per the specifications and these are located in each of the offices and one in the reception area and all connected to one of the 2960 switches. Also, a print server is required, and I used one and I connected it to the switch and put it in one of the offices. I used two 2960 switches connecting to the workstations and also connected to the single distribution switch that I used and connected each other for the backup link. To avoid single-edge failure. In the distribution layer, I only used one layer of three switches which has a connection from the two layers 2 switches and the other connection to the main router. I used the 1941 cisco router for the main router, which is also serving as the DHCP, and all my workstation PCs are obtaining the IP from the DHCP. I have used the straight-through connection for all the mentioned plans I drew. My main router is connected to the border router which is acting as the edge to the primary and secondary sites. The border routers for primary and secondary should be able to communicate. A hardware firewall ASA is connected to the border router and located in the comms room. Overall, the ISP is connected to the border router of the primary site and the secondary site via the serial link.

Description of the used devices

Cisco Routers

* On the Internet or in corporate networks, Cisco is the top routing platform (Liu, Dale, 2009)
* The cisco 1941 is an integrated services router and offers a lot in terms of speed, networking agility and great services.
* I have gone to choose this ahead of Mikrotik or Huawei because cisco is a widely known brand. Most companies use so it. There were some issues with Huawei and the government and that is one reason why I decided to go with Cisco.

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Firewall

* A firewall is a hardware device that is configured in a way to either allow incoming packets or block them for security purposes.
* I have used the ASA 5505 model which suits the needs of a small site or enterprise as the one I have just designed and that is the major reason behind my choice of the model.

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Switch

A switch can be a layer 2 or layer 3 device which broadcasts messages to all the ports, and it can be configured otherwise. I have used to type switch 2960 which is a class enterprise layer 2 switch. And it is ideal for businesses as it is secure and affordable for businesses, and it has 24 ports.

I have also used the 3560 devices as an enterprise-class layer 3 switch IEEE 802.3af and Cisco pre-standard Power over Ethernet (PoE) switches in Fast Ethernet configurations.

Cisco 2960 image

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Cisco 3560

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Personal Computer (workstation)

A PC is the workstation I have chosen, and I have decided to go with an all-in-one desktop from HP with specifications of 128 GB SSD which is faster than the HDD and with RAM of 8GB. It is cheaper and also you get better performance with such memory and a solid-state drive.

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References

1. *Huawei to be removed from UK 5G networks by 2027 - GOV.UK* (2020) *GOV.UK*. www.gov.uk. Available at: https://www.gov.uk/government/news/huawei-to-be-removed-from-uk-5g-networks-by 2027#:~:text=HUAWEI%20will%20be%20completely%20removed,sanctions%20against%20the%20telecommunications%20vendor. (Accessed: May 9, 2022).
2. Liu, D. (2009) *Cisco Router and Switch Forensics: Investigating and Analysing Malicious Network Activity*.
3. *Cisco 1941 Series Integrated Services Routers Datasheet - Cisco* (2017) *Cisco*. www.cisco.com. Available at: https://www.cisco.com/c/en/us/products/collateral/routers/1900-series-integrated-services-routers-isr/data\_sheet\_c78\_556319.html (Accessed: May 9, 2022).
4. *Cisco Catalyst 2960-S Series Switches Data Sheet - Cisco* (2017) *Cisco*. www.cisco.com. Available at: https://www.cisco.com/c/en/us/products/collateral/switches/catalyst-2960-s-series-switches/data\_sheet\_c78-726680.html (Accessed: May 9, 2022).