PROJECT (40%)

TCN6213 Computer Networks
October/November 2024 (Term 2430)

Project start date: **11 Nov 2024 (week 2)**
Interim Design Submission: **17 Dec 2024 (week 7)**
Final Submission Dateline: **28 January 2024 (week 13)**
Group: **Four person Max (can be from any lab session within the same lecture session)**
Software to use: **Cisco Packet Tracer 8.2.2**

Objectives

In this project, you are required to design a network for a typical company that requires its computers to communicate with each other and on the internet.

Company Requirements

A new IT Company has just opened. It aims to provide student labs, provide computers for its education and administrative staff, and set up a web server. The company has just purchased one connection from TMNET providing 1Gbps for upload and download.

In terms of PCs, the center has the following plans:

- It wants to set up **one webserver** to host the center's website and **one fileserver** on which its students can access course materials from home. Each of these will be allocated a different DNS name.
- The center wants to set up two computer labs, each containing **25 PCs (24 PCs for students and 1 PC for Instructor)** with each having internet connectivity.
- Additionally, it wants to allocate **7 PCs**, each of which will be placed in a different classroom for the course tutor to use. These PCs also require internet connectivity.
- **2 PCs** provide support for the system administrator, with the facility to provide any type of Internet services on them.
- In addition, **5 PCs** will be available for administration and another **8 PCs** for tutors. Please note that management has decided that these PCs should not get internet connectivity but should still be able to access the web and file server.
- Finally, a **wireless network** should be made available to students which can allow students internal access to the file and web server **but not to the internet**.

Your task is to come up with a logical, efficient and scalable network design that will be suitable for this center. The company has allowed an adequate budget to purchase any switches and routers that may be required, yet obviously does not want to spend more than necessary.

Design Details

Make sure to divide your network designs such that the component functions are highlighted when you sketch them up. Additionally, guarantee that the system cannot be abused by any malevolent user. Additionally, ensure that every sub-network is divided so that, in accordance with their needs, each one can access the fastest feasible path. Additionally, maintain as simple a design as you can to ensure the least amount of system downtime and facilitate effective troubleshooting. As a tip, divide networks always based on functionalities because similar-functioning PCs will probably speak with each other frequently. Remember to include the ISP link as well!

Deliverables

Create a document with all the required network designs (you should provide enough details so that any technician could create your network structure from the ground up). You are asked to provide diagrams that illustrate how the networks are divided and connected to each other. To create your logical design and labelling purpose for every device that uses **IPv6 addressing**, you can **utilize Cisco Packet Tracer**.

IPv6 address for Project:
Project Leader Student ID No.: 1211103334
2024:1110:3334:1::/64,
2024:1110:3334:2::/64,
2024:1110:3334:3::/64, and so on…

Entrepreneurial Section

Please add this in your first section of the project.
1. Project Implementation – Time and Flow
a. Use Gantt Chart to describe the implementation for each stage of project
2. Project Budget
a. Total Cost (RM)
b. Network Hardware and Components
c. Network software and Configuration
d. Cabling and Sockets components
e. Man- hour requirement

Submission:

1. Physical and Logical Design- drawn using graphic tools
2. Complete topology running in Cisco Packet Tracer- pka/pkt file
3. Presentation of your work

TCN6213 Computer Network Project Rubrics

Setup	Components	Marks	Scores	Remarks
IPv6 Configuration	Static	3		
IPv6 Configuration	DHCP /Auto Configuration	7		
Ping	Lab 2_PC__	2		
	Lab 1_PC__	2		
	Admin_PC__	2		
	Management_PC__	2		
	Classroom___	2		
Accessibility	Web server	10		
	File Server	10		
	Cloud Server	10		
Topology	Physical	10		
	Logical	10		
Report	IP configuration/subnets	10		
	Router Configurations	10		
Students Presentation	Understanding/knowledge	5		
	Skill set	5		
		100		

Additional References

1. Ipv6 subnetting : https://www.youtube.com/watch?v=UIGVPvxnCtk
2. Configure DHCPv6 (variation in Packet Tracer). https://youtu.be/uCQw8mmQ05A
3. Configure a Wireless Network : https://youtu.be/F5A9cG22Sfw
4. Configuring IPv6 Static and Default Routes. https://youtu.be/hDCSdUcurPY
5. Configuring Basic OSPFv3 in a Single Area : https://youtu.be/VWOB0DlzrlY
6. Configure IPv6 Addresses on Network Devices https://youtu.be/82bKjlmaweE
7. Configuring IPv6 ACLs https://www.youtube.com/watch?v=63YGB2uB220
8. Configuring IPv6 ACLs https://www.youtube.com/watch?v=E-2bEiGPSno
9. IPv6 DHCP server and DHCP relay agent configuration and testing: Dynamic IPv6 https://youtu.be/2Lt1aXpCzvQ
10. Dynamic Host Configuration Protocol v6: https://youtu.be/few4dTgnvo4
11. Connecting Cisco Router to DSL Modem with ISP Configurations https://www.youtube.com/watch?v=MXNM7_Kykaw
12. Internet access with the network we built https://youtu.be/FlxF4tiJ1zU
13. Configure a Static IPv6 Address https://www.youtube.com/watch?v=E-2bEiGPSno
14. DNS Server Cisco Packet Tracer https://youtu.be/DfaN-YTDNyE
15. Web Server Configuration https://youtu.be/HWZ6_Z8bi2c
16. DNS, SMTP, FTP, and WEB Server configuration. https://youtu.be/LiUsZSSfBY8