Assignment (10 marks)

TCN2141 Computer Networks
Trimester 1 2019_2020

Interim Design Submission: 14 August 2020
Final Submission Dateline: 18 September 2020
Group: Three person Max (can be from any tutorial group)
Software to use: Cisco Packet Tracer

Objectives

In this assignment, 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 training center has just opened up. It aims to provide student labs, provide computers for its education and administrative staff and also set up a web server. The company has just purchased one connection from TMNET providing 100Mbps for upload and download.

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

- It wants to setup **one web-server** to host the center's website and **one file-server** on which its students can access course materials from home. Each of these will be allocate a different DNS name.
- The center wants to set up two computer labs, each containing **16 PCs (15 for students and I PC for Instructors)** with each having internet connectivity.
- Additionally, it wants to allocate **five PCs**, each of which will be place in different classrooms for the course tutor use. These PCs also require internet connectivity.
- **Three PCs** provide support for the system administrator, with the facility to provide any type of Internet services on them.
- In addition, **three PCs** will be available for administration and another **five 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

When drawing up your network designs make sure you split the design up in a way that emphasizes the function of the components. In addition, make sure that no malicious user would be able to circumvent the system. Additionally, make sure that all sub-networks are split up allowing them the fastest access possible depending on their requirements. Also, keep the design as simple as possible allowing efficient troubleshooting while guaranteeing the least downtime in the system. As a hint, always split up networks in terms of function, since PCs with similar function most probably will often communicate between them. Also, do not forget about the ISP link**!**

Deliverables

Build a document giving all the necessary network designs (enough information should be given that would allow any technician to build your network structure from scratch). You are request to depict the network setup by means of diagrams showing the division of the networks and their interconnections. You are free to choose the format of the network diagram as long as it has the required information. You can use Cisco Packet Tracer to design your logical design and labeling purpose for all devices **using IPv6 addressing**.

Submission:

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