Network Infrastructure assignment

In this assignment, you will design a network considering a given set of requirements and specifications.

# Scope and requirements

You will be designing a new corporate network for a small company operating in one of the following businesses.

1. Tourism
2. Book store
3. Restaurant
4. Drugstore

Select one of the above businesses and design a network based on the following set of generic requirements. **You may make assumptions on other requirements not listed here**.

1. The company has offices in at least 3 locations (suburbs) in Adelaide. The head office has at least two floors in a single building. The other two offices have single floors.
2. The corporate network is connected to the Internet through the head office. The other offices do not have direct links to the Internet; there Internet access is only through the head office.
3. Following services/devices should be available in the network, and accessible by internal and external users as required.
   1. Corporate web server
   2. Corporate mail server
   3. Printers
   4. At least 20 PCs in the head office and 10 PCs in each branch office.
   5. It should be possible to connect laptops to the corporate network through a wireless network.
4. You have been given a private IP address block to be used in the network. You are required to subnet this IP address block as required. Refer to the following table to find out the IP address range allocated to you.

|  |  |
| --- | --- |
| The last digit of your student number | IP address range to be used |
| 0 or 1 | 10.2.0.0/18 |
| 2 or 3 | 192.168.1.0/23 |
| 4 or 5 | 172.16.64.0/20 |
| 6 pr 7 | 10.5.2.128/25 |
| 8 or 9 | 192.168.192.0/19 |

v. If you need public IP addresses in your design, use the range 203.115.0.32/28

# Deliverables

## Part 1 – Report (55 points) – 1500 words

Write a report presenting your design of the corporate network. Your report should include the following sections.

1. **Executive summary**: The executive summary should be aimed at the senior management of the organization that allocates budget for the new network implementation. Therefore, technical words should be avoided as much possible. You should present a brief justification so that the reader should be able to understand how the new network will help their business.
2. **Network design and justification**: This section should include the following.
   1. Assumptions made and the basis for those assumptions.
   2. Technologies and devices used, and justification for using them.
   3. User roles: Determine the users specific to the business you have selected. Describe these roles stating assumptions you have made. Create a table showing the roles defined by you, the number of users in each role and their network access requirements
   4. Logical topology of the network: You may use packet tracer to draw the logical topology. You do not have to do draw all the devices (e.g. 20 PCs). You may draw few devices representing all similar devices in the same location/network.
   5. Physical topology of the network: You may use any suitable drawing tool for this. The physical topology should show the floor plan, device location, device type/name, and physical connections.
3. Discussion: The discussion should include the following
   1. Limitations of your design
   2. Scalability of your design
   3. Further improvements, especially considering security.
4. Appendix 1 – IP addressing plan
5. Appendix 2 – Device table: List all devices selected for the design with their model numbers.

## Part 2 – Packet Tracer Prototype (45 points)

Implement a prototype of your design using Packet Tracer. Your Packet Tracer implementation should adhere to the following requirements.

1. All devices must be labelled, and labels should match the configured hostnames.
2. All locations/buildings must be labelled.
3. The network should function correctly, and it should be possible to successfully ping between any two hosts in the network.
4. For all passwords, use **cisco123**.

You must submit the Packet Tracer file with a single Word document containing the following. This document should be suitably formatted with titles and subtitles.

1. Running configuration of all routers.
2. The output of PING command executed as follows:
   1. From a PC in each branch office to a PC in the head office
   2. From a PC in each branch office to a PC in all other branch offices
   3. Between each router

# Points Guide

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| --- | --- |
| **Report** | **55 points** |
| Executive summary | 5 |
| Presentation of the report (formatting, structure, and language) | 5 |
| Selection of technologies and devices | 5 |
| Assumptions made | 5 |
| User roles | 5 |
| Logical network topology | 10 |
| Physical network topology | 10 |
| IP addressing plan | 5 |
| Discussion | 5 |
|  |  |
| **Packet Tracer prototype** | **45 points** |
| Topology (Arrangement of devices, connections, labelling) | 10 |
| End to end connectivity | 15 |
| IP addressing (this should match the plan presented in the report) | 5 |
| Device configuration | 15 |
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