University of Information Technology
Faculty of Computer Systems and Technologies
CST-32406 Network Design and Engineering

Network Design (Individual Assessment)

Submission Deadline: 18th September 2023

Objectives:

- To investigate network technology through simulation.
- To gain experience of carrying out an experiment, to collect and process experimental data, and to present and analyze results.
- To appreciate the role and value of simulation tools when designing and analyzing networks
- To gain practical experience of using a network simulation tool

Tasks:

The emphasis of this task is to design a network and use a simulation tool. It is necessary to build a network to perform the configurations and experiments with meaningful results.

This **Network Design (Individual Assessment)** is divided into three parts including conclusion.

Part A- Designing a network

1. Design a network for a medium-sized company or organization located at a single site. Design a new model of network based on the requirements of an existing company or organization or invent a new one. To design a network, some constraints are provided as references:
   - The design needs to consider the organization's line of business or needs.
   - The network must be divided into subnetworks each representing department or a group of departments within the organization.
   - The subnetworks must be interconnected with a network core containing at least three routers.
   - Apart from these constraints, the design is freedom, but it must suit the needs of the chosen company or organization and need to justify this aspect.
2. Detailed discussion on the design with the topology and technologies used.
3. Create a network design for configuration and testing.

Part B- Technologies used designing a network

Design the network with technologies include DHCP, static and default routing, OSPF for IPv4, inter-VLAN routing, and VLAN configurations. Security configurations include SSH, port security, switch security. Some network services should be provided by the use of the server farm of the company network. The details of services must be considered for the requirements of an organization.

Part C- Investigation of Network Traffic

Analyze and critically evaluate the results from network design. Detailed explanation of the experiments carried out and providing configuration details.

A mandatory final report:

The final report should be submitted as a single, well-structured report consisting of 15-20 pages of A4 which must include three sections clearly marking Parts A, B and C as well as a conclusion of 200-500 words.

For part A: Detailed and clear documentation of the network design. Include critical discussion of the design, topology and technologies used. Providing in terms of the organization have chosen and specific networking needs.

For part B: Detail and clear documentation for the technologies including types and number of users. In the context of the type of organization, explaining the services provided for the organization should explain details.

For part C: Results from simulation study should explain details.

Conclusion: A clear statement of what has been achieved, what you have learned, and what could be improved.