Network Design and Performance (NDP) Assignment

National Technological University (NTU) is a well-known institution dedicated to academic excellence, research, and fostering a vibrant learning community. Established in 1992, it has played a significant role in Malaysia's higher education landscape. The university campus covers 50 acres and includes state-of-the-art facilities, modern classrooms, research laboratories, libraries, and recreational spaces. There are eight buildings on the campus, seven used for teaching and two for research. The Information and Communication Technology (ICT) team recently conducted a performance review of the LAN network in the IoT Research Center (IoTRC) and discovered that it was not functioning optimally. This issue was causing significant difficulties for faculty and students who could not carry out their research work in cybersecurity. Consequently, the ICT team met with the university senate, academic staff, and students to create a more conducive network environment and decided to rebuild the center's LAN. Their plan is to provide a dedicated high-speed LAN for the center, which they believe will help faculty and students to carry out their research work more efficiently.

Please note that students can make assumptions if they require further information regarding NTU's network and connected systems.

Task 1:

CLO1 (Group Assignment) 30%– To achieve this learning outcome, student must form a group to analyse network design approaches, business and technical goals, network models and tools to design an effective network for the given scenario.

The focus of this assignment is to collaborate with others to complete part 1 of NDLC by exchanging ideas, sharing information, and brainstorming solutions.

Evaluation Criteria:

- Selecting appropriate Network Design Approach – 5%
- Analysing business and technical goals-10%
- Choosing the best network models and tools to design an effective network-10%
- Documentation – 5%

Task 2:

CLO2 (Individual Assignment - Research)-30% - To achieve this learning outcome, students must individually complete part 2 of NDLC. In other words, they must design and

configure a network using a Network Simulator. Research must be done to determine the best protocols, standards, infrastructure connectivity, data security, and network management strategies for a network design.

This task emphasizes proposing suitable protocols, standards, network management strategies, and data security mechanisms for a given network design case study. It also points out the significance of communicating the design with others for evaluation.

Evaluation Criteria:

Network Design (Research)-

- Identify appropriate switching/routing protocol, standards & infrastructure connectivity – 15%
- Network security and network management strategies – 10%
- Network Design Presentation and Documentation -5%

Task 3 –

CLO3(Individual Assignment - Simulation) – 40%. To achieve this learning outcome, the network design must be implemented and tested for performance by each student individually. That is, the data generated by the simulation tool must be collected and assimilated, the appropriate data visualization type selected, the data evaluated, the interpretations recorded, and conclusions drawn.

Evaluation Criteria:

- Collect and assimilate the data (Network Metrics) – 5%
- Select the appropriate data visualisation type – 5%
- Evaluate the data (Network Metrics) – 5%
- Record the interpretations – 10%
- Draw conclusions – 5%
- Simulation Document – 10%