Unit number: 2. Networking

Assignment Brief

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| Student Name/ID Number |  |
| Unit Number and Title | 2. Networking |
| Academic Year | 2021-2022 |
| Unit Tutor | Rama , Rana ,Khalil and Mohammad |
| Assignment Title | Research and Implementing Network |
| Issue Date | 25-4-2022 |
| Submission Date | 25-5-2022 |
| Submission Format | |
| The submission is in the form of: An individual written report. This should be written in a concise, formal business style using single spacing and font size 12. You are required to make use of headings, paragraphs and subsections as appropriate. | |
| Unit Learning Outcomes | |
| LO1. Examine networking principles and their protocols.  LO2. Explain networking devices and operations.  LO3. Design and Implement a network system.  LO4. Implement and diagnose networked systems. | |
| Transferable skills and competencies developed | |
| Task A Network Principles  Task B Network devices and servers  Task C Design and Implement A network system | |
| **Vocational scenario** | |
| You are employed as a network specialist at a technology company specialized in the field of networks, and you were assigned to work within a project to design and develop a computer network for an educational institution consisting of two branches, the main branch in Amman and the other in the city of Karak (about 150 km from the main branch).  The main branch network consists of 3 networks, two of which are for educational departments and one for administrative departments. As for the Karak branch, it includes only two networks for the educational departments and one network for the administrative department. This branch communicates with the main branch through a direct connection.  In both branches, there is a public wireless network through which systems, applications, and Internet services can be accessed. There is also a network printer in each department.  You will be required to complete four tasks as part of this role and included in one report, you will be assessed based on how well you have completed the required activities and your overall performance will be noted. This will include how you will present and behave like a network specialist and present your network model using a simulation software, throughout the assessment.  **Task A Network Principles**  Resolve and specify the hardware **devices** required networks design to operate all the required services:   1. Negotiate and list the used network types in the whole design ,   And determine the number of each type, after that specify and explain the network types.   1. Consider the network standards to explain the standards required in your design. 2. Specify the network topologies in general. 3. Differentiate the protocols used for the network transmission between switches and routers , consider the OSI model(IP , Ethernet protocols) 4. Assess the used topology to connect the LAN switches with the Router according to the bandwidth requirements   **Task B Network devices and Servers**  Given that the Amman branch consists of 3 floors, with 50 hosts per floor, the host IP’s are obtained dynamically. All connections are controlled by DNS server.   1- Consider the necessary devices for this network and the principle of their work. Also, examine the required server types.  2- Negotiate briefly how DHCP and DNS can help to improve network infrastructure?  3- Examine the required server types for best performance and cost effectiveness.  Hint: Most of efficient networks relies on domain concepts, file sharing and resource sharing and user permissions.    **Task C Design and Implement A network system**  Consider the same scenario of **task B.**  **You should Add screen shoot for the design system and submit the packet tracer file.**   1. Formulate and perform the specified network system in Amman branch   And consider that each LAN has 3 hosts only (for demonstration )   1. Install and configure the DHCP service on the branch router 2. Assess and check your design, document how your design meet the requirements. 3. Suggest possible enhancements for the networked systems. 4. Formulate a maintenance schedule to support the networked system. 5. Recognise you design considering the VLAN and subnetting: | |
| Assignment activity and guidance | |
| General guidance  This assessment has been designed to allow trainees to demonstrate the practical skills required in a Network and IT Support role. The assessment consists of four tasks that should be undertaken in a realistic or simulated work environment and should require each trainee to spend approximately 5 weeks on the entire assessment.  It should be noted that the assessment should be undertaken in a holistic manner, and therefore all tasks should be delivered as part of the same assessment, and not in isolation. The trainees may undertake the tasks in any order that is best for the center, though tasks that involve any follow-through should be undertaken sequentially. | |
| **Recommended Resources**  **Please note that the resources listed are examples for you to use as a starting point in your research – the list is not definitive.** | |

**Learning Outcomes and Assessment Criteria**

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| Pass | Merit | Distinction |
| **LO1** Examine networking principles and their protocols | |  |
| **P1** Discuss the benefits and constraints of different network types and standards.  **P2** Explain the impact of network topology, communication and bandwidth requirements. | **M1** Compare common networking principles and how protocols enable the effectiveness of networked systems. | **LO1 & 2**  **D1** Critically evaluate the topology protocol selected for a given scenario to demonstrate the efficient utilisation of a networking system. |
| **LO2** Explain networking devices and operations | |
| **P3** Discuss the operating principles of networking devices and server types.  **P4** Discuss the interdependence of workstation hardware with relevant networking software. | **M2** Explore a range of server types and justify the selection of a server, considering a given scenario regarding cost and performance optimisation. |

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| Pass | Merit | Distinction |
| **LO3** Design efficient networked systems | |  |
| **P5** Design a networked system to meet a given specification.  **P6** Test and evaluate the design to meet the requirements and analyse user feedback with the aim of improving efficiency. | **M3** Install and configure network services and applications on your choice. | **D2** Design a maintenance schedule to support the networked system.  **D3** Use critical reflection to evaluate own work and justify valid conclusions. |
| **LO4** Implement and diagnose networked systems | |
| **P7** Implement a networked system based on a prepared design.  **P8** Document and analyse test results against expected results. | **M4** Recommend potential enhancements for the networked systems. |