IT 6003: Computer Networking
Project Report

Semester:	Semester B, 2022/2023
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Student names:	
Student IDs:	
Class Group:	
Learning Outcomes Covered:	The following learning outcomes will be tested: 1. Explain the fundamentals, concepts and technologies of the TCP/IP and OSI networking model. 2. Design and implement an IP addressing scheme using VLSM. 3. Configure, test and verify network devices. 4. Explain how different routing protocols operate in the network. 5. Implement a network infrastructure to a detailed use case.
Weighting:	30% of the overall mark
Instructions:	• Form a group of 3 or 4 students, • Your group will write a report on the requirements for the Computer Network of a new company and then implement the physical network. • This report must be submitted on Monday 5th June 2023 at 11:55 Pm. • Use Packet Tracer 8.2 which is located on Moodle. • Late submissions (less than 3 days) will be capped at 60%. Late submissions (more than 3 days) will receive 0 grade

Learning outcomes assessment

Part 1	1	2	3	4	5
1	x	x			
2	x				
3	x				
4	x				
5	x				
6	x				
7				x	
Part 2					
1			x	x	x
2			x		x
Sum_LO's	6	1	2	2	2

Networking 1 Project Scenario

Emerging Technologies Networks (ETN) is a company specialized in providing world-class networking infrastructure and application services. Recent growth in the company and latest developments in the networking industry; ETN is expanding into the following countries in the Gulf region as shown in Table 1.

Country	**City**	**Staff**
Bahrain	Manama, Riffa	140, 40
Saudi Arabia	Riyadh, Dammam	210,110
United Arab Emirates	Abu Dhabi, Dubai	90,90
Kuwait	Kuwait, Alahamadi	48,30

Table 1: Number of Hosts per branch

ETN plans for the future and has hired your group as network engineers to **plan, design, implement, and troubleshoot the network using both IPv4 and IPv6 protocols**. The company will host an **internal email server, website server, DNS, FTP server and will use Telnet** to remotely

configure networking devices. This report will contain your group's choices to plan, design and implement a fully functional computer network for the company based on IPv4 and IPv6.

Project Debrief

The project is divided into two parts; the first part contains a detailed report that will be presented to the company about its future network. For more details, refer to the report section below. For step number 6; each student has to write about network communication based on OSI layers.

The second part of the project will include the implementation and troubleshooting of the project based on your plan and design presented to the company earlier.

Report

The report should contain information on the following issues:

1. IP addressing and subnetting scheme (IPv4 and IPv6) for the company.
(8 Marks)
2. Application layer services the organization requires.
(2 marks for explaining how these are used on the network)
3. Network devices needed to implement the computer network.
(1 Mark, 0.5 marks for listing devices, 0.5 marks for explaining what these devices are used for)
4. Protocol used to operate the LANs and how this protocol operates.
(2 Marks, 0.5 marks for naming protocol and 1.5 marks for describing in detail how the protocol operates)
5. Transmission media used in the organization.
(2 Mark, 1 mark for listing the media and 1 mark for explaining the operation of the media on the network)

6. Before the organization draws up a security policy the network manager wishes to know what protocols will operate on the network. Use the 7 layers of the OSI protocol stack and describe the protocols that will operate on this network at each layer. In doing so describe one communication between a PC from one branch to a PC in a different branch, use WireShark (1 mark) and PacketTracer (1 mark) to describe the data flow over the network. Mention also;

a. Network devices used in the data flow. (0.5 marks)
b. Interfaces used. (0.5 marks)
c. Protocols needed for communication and what these protocols are used for. (3marks)
d. Addresses and identifiers used in the communication. (2 marks)
e. Any other information you feel is necessary (2 marks)
(10 Total Marks)

It is up to student to explain this step using IPv4 or IPv6.

7. Choose a routing protocol (for both IPv4 and IPv6) and give the advantages of this routing protocols over other options. (2 Marks)

Implementation

1. Implement this network in PacketTracer and upload a fully functioning version to Moodle. (15 Marks)
2. Implement 2 application layer services using IPv4 and 2 application layer services using IPv6. (8 Marks)

In total there are 27 marks assigned for the report and 23 marks for the Packet Tracer implementation. (50 marks total)