AACS2034 Fundamentals of Computer Networks

Assignment

Academic Session: 202401

Group: Maximum 2 members in the group. Every member in the team **MUST** contribute and participate actively in the entire process of completing the assignment.

Weightage towards the assignment: Total: 100%

(This assignment contributes *30%* to the final coursework marks)

Submission Deadline: **Week 11, Tuesday, 30 April 2024 (latest by 12 afternoon)**. All documents must be upload into **Google Classroom**.

Learning outcome being assessed - CLO2: Use digital resources to complete tasks related to network configurations based on the given scenarios. (C3, PLO6)

Assignment Question (100 marks):

You are tasked with designing a Local Area Network (LAN) for a small to medium-sized organization called TechXSolutions Sdn. Bhd.." The company specializes in providing IT consulting services and has recently expanded its operations. The LAN must support various departments including Administration, Sales, Customer Service, Digital IT Division and Human Resource. The task needs to be carried out Cisco Packet Tracer software.

Scenario

TechXSolutions Sdn. Bhd recently hired you as their Network Engineer to design their network. You have been asked to design and set up local area networks for the organization with buildings in different locations. Use the IP address 10.0.0.0/8 to plan the network.

This is the distribution of their office space:

Location A houses Administrative Department on the second floor, Sales Department on the first floor and Customer Service Department on the ground floor. The Digital IT Division which consists of (Gaming Tech, Big Data Hub and Cybersecurity units) are in different floors of Location B which is next to Location A with the distance of 500 meters.

Besides that, there are five Research & Development labs in Location C, 200 meters away from Location A.

Each of the departments and facilities is required to have its own subnet. All the research & development labs should be in one subnet. The table below shows the number of host addresses required for each department, facility and room.

Name	No. of Hosts Required
Administrative Department	458
Sales Department	384
Customer Service	340
Digital IT Division (inclusive of the 3 depts below)	
Gaming Tech	164
Big Data Hub	492
Cybersecurity	225
Research & Development Labs	288

You need to consider number of addresses needed for 15% growth in all areas.

You also are required to design, implement and test an addressing scheme for the organization that is suitable for the network topology, and the host requirements. Your tasks include configuring initial settings on the network devices (routers, switches) and configuring IP address parameters on host devices to provide end-to-end connectivity. You need to calculate and determine the number of required switches for the networks (considering the number of devices for each subnet) and implement adequate number of switches in the networks. Besides that, *minimum one router* should be used in the networks.

Instructions / Requirements

● Design the local area network based on the scenario.

● Rename all the intermediary devices (eg.: Router1, Switch1 etc.)

● Configure initial settings on ALL the intermediary network devices. Use CLa33 as password for all lines (VTY lines & Console 0) and aaCS2034 as secret password.

● Design suitable ***classful IPv4 addressing scheme*** for the networks. The calculations for all the subnets must be clearly shown in the report.

● Configure addressing on ALL intermediary network devices and SOME end devices [SOME end devices: which means at least configure few PCs (minimum 1 PC per switch) in each location, which depends on your network design].

● Verify IP connectivity between all devices in different locations.

● Document all your design, including network topology design, subnet table, addressing table for all devices, etc. Screen capture the ping connectivity from one subnet device to another subnet device. There will be multiple ping connectivity print screens according to your network design.

● You and your team member are required to explain the network design, addressing design and implementation of the network. Both of your explanations are required to be recorded in ONE video (minimum 5 minutes to maximum 10 minutes).

● You are required to use different digital resources [examples: TeamViewer, cisco packet tracer, online Cisco networking Academy curriculum materials, Google Meet, Zoom, video recorder, online screen capture, YouTube, etc] to collaborate with your team member to complete the assignment.

● You are required to edit the "user profile" of your .pkt file to become YOUR NAME AND TEAM MEMBER NAME.

** If the design and implementation are correct, all the end devices and the intermediary network devices should be reachable over the network.

<u> Submission Guidelines</u>**

● Submit the following files (all the files to need to be zipped/compressed into 1 file) to your tutor via Google classroom before the deadline of submission: (Only one of the team members [usually team leader] submits all the necessary files into Google Classroom.)

1. **ONE (1)** Packet Tracer file (in .pkt file format). The .pkt file naming convention is as given below initial.tutgroup.pkt. For example, your teammate and your name are Steven Chow Sing An and Rosalind Dass, then the .pkt file name should be given as *ScsaRd.DCS1.pkt*

2. **ONE (1)** recorded video with both of your voices & faces (in .mp4 file format) which must include the following content:

● Both of the team members are required to present

● Your computer screen recording with voice & face.

● Your introduction (contains your full name, your academic institution and programme).

● Your explanation for network design, addressing design and implementation of the network, ping connectivity, etc.

● You are allowed to do video enhancement, effect, background music. (*Note: The background music should not disturb the clarity of the presentation).*

● Upload the recorded video to **BOTH** of your YouTube account (recommended setting for visibility is set to unlisted) and to **SHARE** your recorded video on your Facebook or any other social media platform.

3. Assignment Report (in .pdf file format).

- The completed assignment report must have the following documents and arrange them according to this sequence:
    - Front Cover
    - Table of content
    - Declaration Form for each team (see Appendix A)
    - Assignment rubrics form for each team (see Appendix B)
    - Introduction Page (Introduce the network design of this assignment)
    - Address design (e.g. address class, private IP address, network diagram), subnet table, addressing table for ALL devices in the network diagram.
    - Screen captures the ping connectivity between end devices in different subnets.
    - Digital resources (You MUST explain in details of the digital resources used to do the assignment)
    - Both of your recorded video YouTube links and screen capture of video posted on both of your Facebook and other social media.
    - References (Harvard referencing)
    - Check plagiarism (originality) report as an appendix

Late Submission

As per GUIDELINE ON LATE SUBMISSION OF COURSEWORK:

Penalty for late submission of coursework shall be imposed after submission deadline / extended submission deadline:

i) Late submission within 1 - 3 days: total marks to be deducted is 10 marks.

ii) Late submission within 4 - 7 days: total marks to be deducted is 20 marks.

iii) Late submission after 7 days: reject coursework and zero mark shall be awarded.

Please access to your Intranet and refer to TUNKU ABDUL RAHMAN UNIVERSITY OF MANAGEMENT AND TECHNOLOGY **guideline on late submission of coursework and Plagiarism Policy for more detail.**

ALL THE BEST and GOOD LUCK!!