BRACU Network

Introduction

You have been assigned the task of designing the BRACU network. For simplicity, you have been asked to design the network only for 6 departments. The departments are CSE, MNS, EEE, BBS, LAW, and BIL. The distance between the departments and the number of members in each department are given below.

	CSE	MNS	EEE	BBS	LAW	BIL
CSE (250)	0					
MNS (150)	40	0				
EEE (100)	20	60	0			
BBS (170)	30	70	10	0		
LAW (50)	50	90	80	80	0	
BIL (120)	70	110	90	100	60	0

Requirements

Topology Design & Server Setup

- Every department is represented by a router.
- The MNS department is only connected to the CSE department.
- CSE, EEE and BBS departments are connected to one another via a switch
- CSE, LAW and BIL departments are connected to one another directly.
- All the departments have their own Email Servers set up. You have to configure the emails for communication.

- Only the CSE (www.cse.sds.bracu.ac.bd) and MNS (www.mns.sds.bracu.ac.bd) departments have dedicated web servers. You have to configure the web servers so that all devices can visit them.
- Only the CSE department has the central DNS server. You have to configure the DNS server so that all devices can use it.
- The CSE Department's router is working as the DHCP server for all the departments except for LAW and BIL. LAW and BIL have their dedicated DHCP servers. You have to configure this.
- Each department has a printer, and you can show only two PCs to represent all the devices of that particular department.

Addressing

- Select the student ID of the first member of your group. Now take the last 4 digits of that ID and divide them into two parts containing two digits each. These two parts are the first two octets of the network address of the university. The third and fourth octets are 0, and the prefix mask is 16. Suppose the ID is 20201002. Then the last four digits are 1002. Now dividing it into two parts gives 10 and 02. So the Network address is 10.2.0.0/16.
- Subnet this network using VLSM to provide a network address to each department.
- LAW, BIL, EEE and MNS departments' PCs will get IP addresses dynamically. All other devices' IP configuration needs to be configured manually.

Routing

- CSE, EEE and BBS departments will share their routing table with one another using RIP protocol.
- The CSE department is aware of all possible networks, either dynamically or statically.
- MNS department can reach other departments only through the CSE department, and so a default path needs to be set up.
- LAW and BIL departments know about other networks using static routing.

- If the path between the CSE and the LAW department is down, then the LAW department sends the packets through the BIL department using recursive routing.
- If the path between the CSE and the BIL department is down, then the BIL department sends the packets through the LAW department using recursive routing.

You are allowed to make any valid and necessary assumptions while designing the network infrastructure.

Deliverables

- The network mentioned above should be implemented in Cisco Packet Tracer, with the necessary devices and full configuration.
- After completion, you should be able to test the conditions imposed, and all the devices should be able to ping one another.
- You will have to submit the following:
    - Work Distribution among the group members [Who did which part]
    - The pkt/pka file
    - Picture of the Network topology diagram with proper labels [You have to show the network addresses using notes for each network]
    - A PDF containing
        - VLSM tree
        - IP address table
        - The configuration commands of all the routers you have implemented.