

## **Brac University Under Attack**

You are a person who has recently graduated in Computer Science and Engineering (CSE) from BRAC University. One morning, you wake up to a shocking piece of news—aliens have attacked BRAC University during the night. Before anyone could fully understand what was happening, they had already taken over the new campus and formed a powerful protective shield around it. The shield is so strong that even with advanced technology, scientists are unable to find any way to penetrate it.

To ensure that academic activities can continue without interruption, the university authorities decide to build a temporary campus. Initially, the temporary campus will consist of five buildings named: CSE, EEE, MNS, Admin and Server.

After the construction is completed, the authorities decide to form a team of graduate students to design and build the network infrastructure for the temporary campus. You are invited to join this team. The university has also provided a list showing the number of users in each building.

Building Name	Users	Email
CSE	1500	cse@mail.com
EEE	700	eee@mail.com
MNS	500	mns@mail.com
Admin	250	adm@mail.com
Server	5	

While creating the network infrastructure, there are certain restrictions and rules that you need to follow:

- You may represent each building as a router and use the necessary amount of switches to connect the devices altogether.
- Each building will have a Super Computer to exchange secret mails.
- The Server Building will contain the Web, DNS, Email and DHCP servers. All the servers have to be configured manually.
- The Server building will be directly connected with the Admin Building.
- The university is very concerned about the security. As the servers are the backbone of a network system, the Server Building's network access should always be monitored. To ensure that, the traffic of CSE, EEE, MNS should go through the Admin Building's network to access the Servers.
- However, due to the heavy load from CSE users, a secondary route is required to connect to the Server building. To ensure proper traffic monitoring, an intermediary router needs to be set up. We will call it Backup Router.
- The three buildings (CSE, EEE, MNS) will be isolated from each other. There won't be any direct communication between them.
- The website should be accessible using the URL [www.bracu.com](http://www.bracu.com). Accessing the web server will show the message, "Welcome To Brac University".

## Addressing

- Choose an appropriate network address and create subnets to assign to each of the buildings so that the least amount of IP addresses are wasted.
- The Super Computers will use the static IP addressing. The IP Address will be the last possible host IP address of that network.
- Server Building's devices IP Configuration need to be configured manually.
- CSE, EEE, MNS buildings PC's will get IP addresses from the DHCP Server.

## **Routing**

- To ensure security, Server building will use only static routing. It will also have a default static route pointing toward the Admin Building.
- CSE, EEE, MNS and Admin buildings will share their routing table with one another using RIP protocol.
- Each router will have knowledge about all other networks.
- If the path between CSE and Admin building is down, all traffic of CSE will travel through the Backup Router using the recursive routing to reach the Server Building.

Showing 2 end devices per network excluding the Super Computer is good enough to represent the whole user base at the building. You need to be able to ping each building from another after all the configurations are complete. 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.