Topic 8

Time Variance Authority (TVA)

He who remains has decided to retire and wants to hand over the TVA to you. As a timekeeper of the TVA your job is to ensure that there are no nexus events and that a single timeline flows throughout the multiverse. Now, in order to maintain the sacred timeline, you decided to set up a network infrastructure between the time variance authority (TVA) headquarters and the apocalyptic locations. This is to ensure that no variant is able to hide in those apocalyptic locations that will later try to create a nexus event.

Now to create your networking architecture, you are given the table below which consists of the population of the locations in brackets and the distances between the two locations in each cell.

	Herb's House	**Asgard**	**Gulf Coast**	**Lamentis 1**	**The Void**	**TVA Headquarters**
Herb's House (1020)	0					
Asgard (4250)	612	0				
Gulf Coast (511)	60	459	0			
Lamentis 1 (3829)	526	114	448	0		
The Void (1240)	928	377	902	335	0	
TVA Headquarters (7112)	947	312	878	412	102	0

*The numbers in brackets () specify the population size of the location and the values in the table specifies the distance (in miles) between locations. *

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

- Consider each location as a separate LAN network connected by routers.
- For that, you need to choose an appropriate private network address and from that create subnets to assign to each location. But remember you can use only half the available IP addresses from the network address i.e 192.168.1.0/24 has 254 possible IP addresses, but you can use only 127 which is half of that.
- Don't choose reserved addresses as your network address. Example: 0.0.0.0 0.0.0.0
- Assign IP addresses to all interfaces and devices. You have to show at least two end devices for a location.
- TVA Headquarters (7112) has a web server and a DNS server that will be used to control the entire TVA.
- The Void is connected to an ISP router which is a public network. The ISP router has a PC that wants to access the web server in your private network. As a result, you need to translate the web server's private address into a public address to communicate with the ISP network. For this, you need to use

NAT which you have learned in your theory as well as choose a public network address for the ISP and an appropriate inside global IP address for the Web Server.

- You will have a DHCP server that should dynamically provide IP addresses to at least half the LANs.
- Establish connections among all the networks with the shortest route possible.
    - Must have at least one floating route.
    - Must have a backup system to handle missing routing entries.
    - Configure half of the network to be routed dynamically.
- Make sure that you can ping from a device in one location to another after completion.

Deliverables

- The network mentioned above should be implemented in packet tracer, with necessary devices and full configuration.
- After completion you should be able to test the conditions imposed.
- You will have to submit the followings:
    - Network topology diagram with proper labels
    - The configuration commands of all the routers that you have implemented.
    - VLSM tree
    - IP address table