Unknown Organization

You are a member of a super-secret mercenary organization that no one knows the name of, which is currently on the run from the United Nations. Hence, the leader of the organization has announced the relocation of their establishment to a remote and secure location. She has decided that it would be best to build bunkers under the Mount Everest and open settlements there. The leader trusts you a lot since you have been working in the intelligence department of the organization for ten years. So, she entrusted the responsibility of building the organization's entire new communication infrastructure to you. You have to keep in mind that there are five major sectors in the organization: Headquarters (H), Lobby (L), Mercenary (M), Intelligence (I) and Undertaking (U), each connected to the other. The following shows the distance between the sectors and the number of members in each sector:

	Headquarters	Lobby	Mercenary	Intelligence	Undertaking
H (1432)	0				
L (3200)	59	0			
M (20)	68	58	0		
I (520)	96	56	66	0	
U (20)	58	58	68	98	0

Here are the requirements for making the perfect infrastructure for the organization:

- Every sector is represented by a router.
- The Headquarters is the centre of all operations. Any communication between the other sectors must go through the Headquarters.
- The Intelligence sector often communicates back and forth with the Headquarters. So, each of these sectors has their own Email Servers set up. You have to configure the emails for communication. They use 'mail.intelligence.org' with '<user>@intelligence.org' and 'mail.headquarters.org' with '<user>@headquarters.org' respectively.
- The Lobby is where Mercenaries are resting and waiting for assignments. The Headquarters will send new assignments to a Printer in the Lobby to be displayed on the bulletin board.
- The Undertaking sector handles all the information for old and new assignments. It has its own Web Server which will handle the query for the URL 'assignments.undertaking.org' and show a webpage that will say 'You are now viewing Confidential Information regarding all the Assignments Undertaken by the Organization!'.
- The Mercenary sector was made separately to store the data for the enormous number of mercenaries enrolled in the organization. It has its own Web Server which will handle the query for the URL 'mercenary.information.org' and show a webpage that will say 'You are now viewing Confidential Information regarding all the Mercenaries Enrolled within the Organization!'.
- The DNS Server is located in the Headquarters and handles the DNS query for all webpages from anywhere in the organization.

- The Headquarters contains a computer that belongs to the leader of the organization and has access to the Headquarters Router and can configure it anytime.
- Logical Address:
  - Choose a suitable network address for the organization, create subnets and assign to each sector with the least amount of waste. Note that the number of members in each sector does not include the IP addresses required in the router interfaces.
  - The Headquarters uses static IP addresses for the leader's computer. The rest are assigned dynamically using a dedicated DHCP Server.
  - All the Web Servers, DNS Servers, DHCP Servers and Email Servers have static IP addresses.
  - All the other sectors assign IP addresses dynamically. The DHCP Server in the Headquarters is responsible for assigning the IP addresses to all the sectors. Make a separate DHCP Pool for each sector.
- Routing:
  - All communication between any sector must pass through the Headquarters as long as it is active.
  - When any sector wants to communicate with another, they send the message to Headquarters first. The Headquarters then forwards it to the destination sector using the shortest route possible.
  - If the Headquarters is inactive, then the sectors will use the shortest route possible to reach the destination without passing through the Headquarters.
  - You need to determine which routes will be static using the above information.
  - All the remaining paths will be routed dynamically.
  - No default routes should be used for communication.
- Showing three additional end devices in each sector is enough to represent all the members.

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

You will have to fulfill the following:

1. The network mentioned above should be implemented in Cisco Packet Tracer, with the necessary devices and full configuration.
2. After completion, you should be able to test the conditions imposed.
3. Things you need to submit:
   a. Cisco Packet Tracer file.
   b. Network Topology Diagram with proper labels.
   c. Configuration Commands of all the Routers.
   d. VLSM/Network Address Table.
   e. IP Address Table
   f. Any assumptions made.