Team Rainbow

Team Rainbow is an elite international counter-terrorism unit comprised of operatives from counter-terrorism organizations from all around the world. To provide training for new recruits and to provide training exercises to existing members Team Rainbow aims to setup six bases of operation which are code-named: Eagle Watch, Rogue Spear, Raven Shield, Black Arrow, Vegas and lastly Shadow Vanguard. These bases will be addressed as **Bases** or **Branches.** Among these branches there will be two **field offices** in **Eagle Watch** and **Rogue Spear** base which will be situated in the premise of the respective base and also the field offices will be in the same network of the respective base. The bases have to be connected with each other to share training progress, mission progress, mission report, recruitment report etc. You are hired by Team Rainbow's director Dr. Harry Pandey to design and implement a network to establish communication between all the bases/branches according to his requirements. In the following table the distance is given in kilometer between each of the bases/branches and the number of devices operated at each base/branch are mentioned in brackets beside the name of each base/branch.

	Eagle Watch	**Rogue Spear**	**Raven Shield**	**Black Arrow**	**Vegas**	**Shadow Vanguard**
Eagle Watch (950)	0					
Rogue Spear (452)	2021	0				
Raven Shield (238)	2085	1127	0			
Black Arrow (54)	1776	1578	1509	0		
Vegas (82)	1022	1289	1372	1216	0	
Shadow Vanguard (160)	1342	1145	1109	1265	1707	0

*The numbers in brackets () specify the number of devices in the branch and the values in the table specifies the distance (in kilometers) between branches. *

While creating the network infrastructure you were provided with certain restrictions and rules that you need to follow:

- Choose an appropriate network address and create subnets to assign to each of the branches with the least amount of waste.
- But remember you can use only the **odd** IP addresses from the available IP range of a network address i.e. 192.168.1.0/24 has 256 possible IP addresses, but you can take only 192.168.1.1/24, 192.168.1.3/24, 192.168.1.5/24 etc. as host IP addresses.
- Raven Shield, Black Arrow, Vegas and Shadow Vanguard will use private IP addressing while the other two branches will use public IP addressing
- Vegas branch will have a web server and a DNS server. When someone connects to the web server it will show "To protect and serve" in the homepage www.rainbowsix.com
- As mentioned before Eagle Watch and Rogue Spear has field offices so, for security they will use static addressing while the other branches' IP address will be assigned using DHCP

- Eagle Watch and Rogue Spear will be communicating among them that is why they asked for an email server to be set up so, that can exchange mail among them
- Raven Shield and Black Arrow will have printers to keep recruitment records
- Establish connections among all the branches with the shortest route possible. When establishing connection keep the following things in mind:
    - There has to be a backup system so, that missing route entries can be handled properly. You cannot use default routes to communicate or exchange packets. Packets have to travel through either dynamic or static routes. You have to use static or dynamic routing
    - Configure half of the network to be routed dynamically and another half statically
    - There have to exist at least one floating route among the branches
- Showing two end devices per branch is enough to represent the whole population of each branch (excluding special devices such as: printers). You have to remember that Vegas and Shadow Vanguard will have one laptop in each of the branch
- You have to be able to ping from one branch to another after all the setups are properly completed

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