Packet Tracer Final Exam Revision

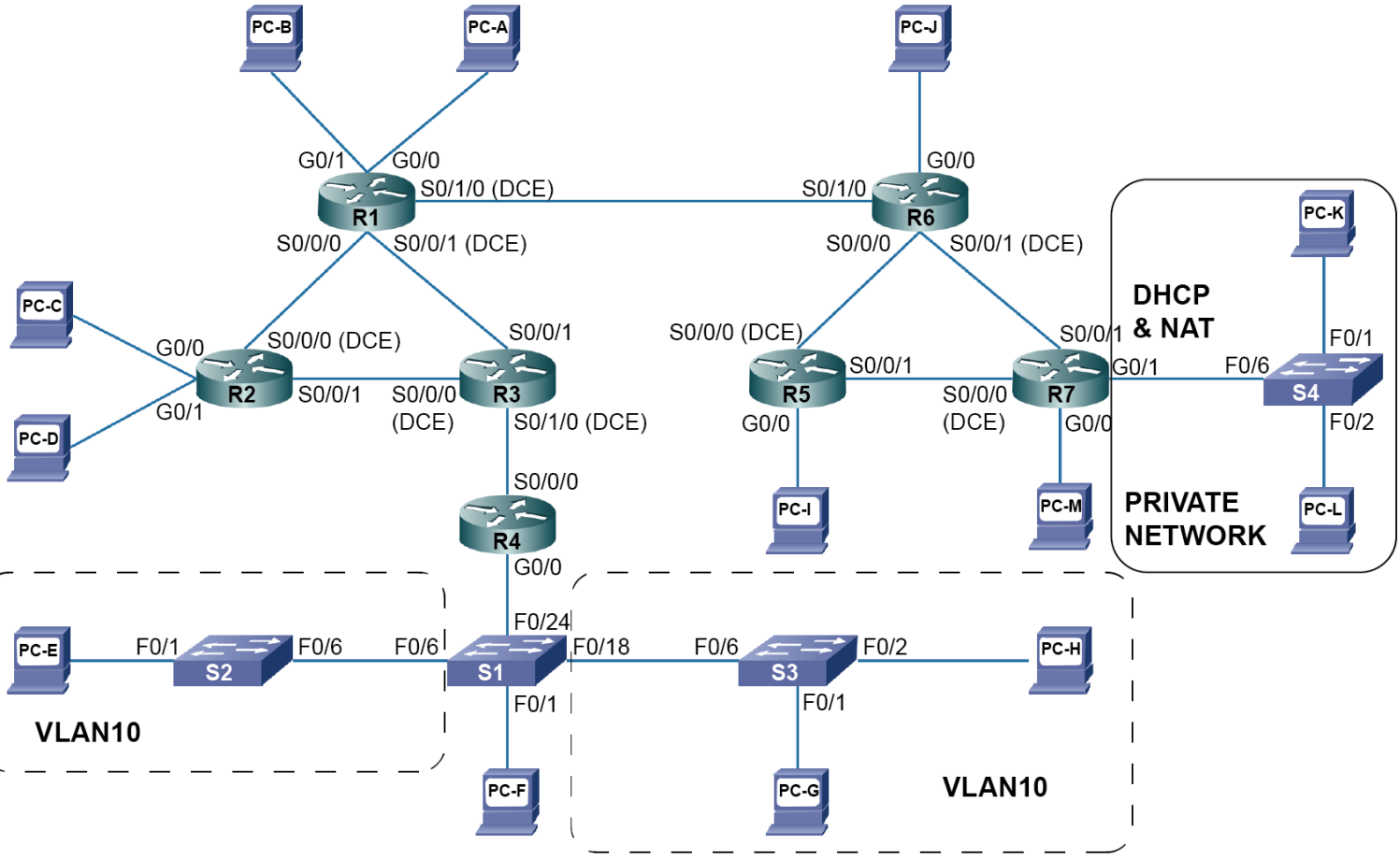
This is just a revision, so it contains most of the contents in our lab.

In real exam would be would be easier. (Very easy compare to the revision)

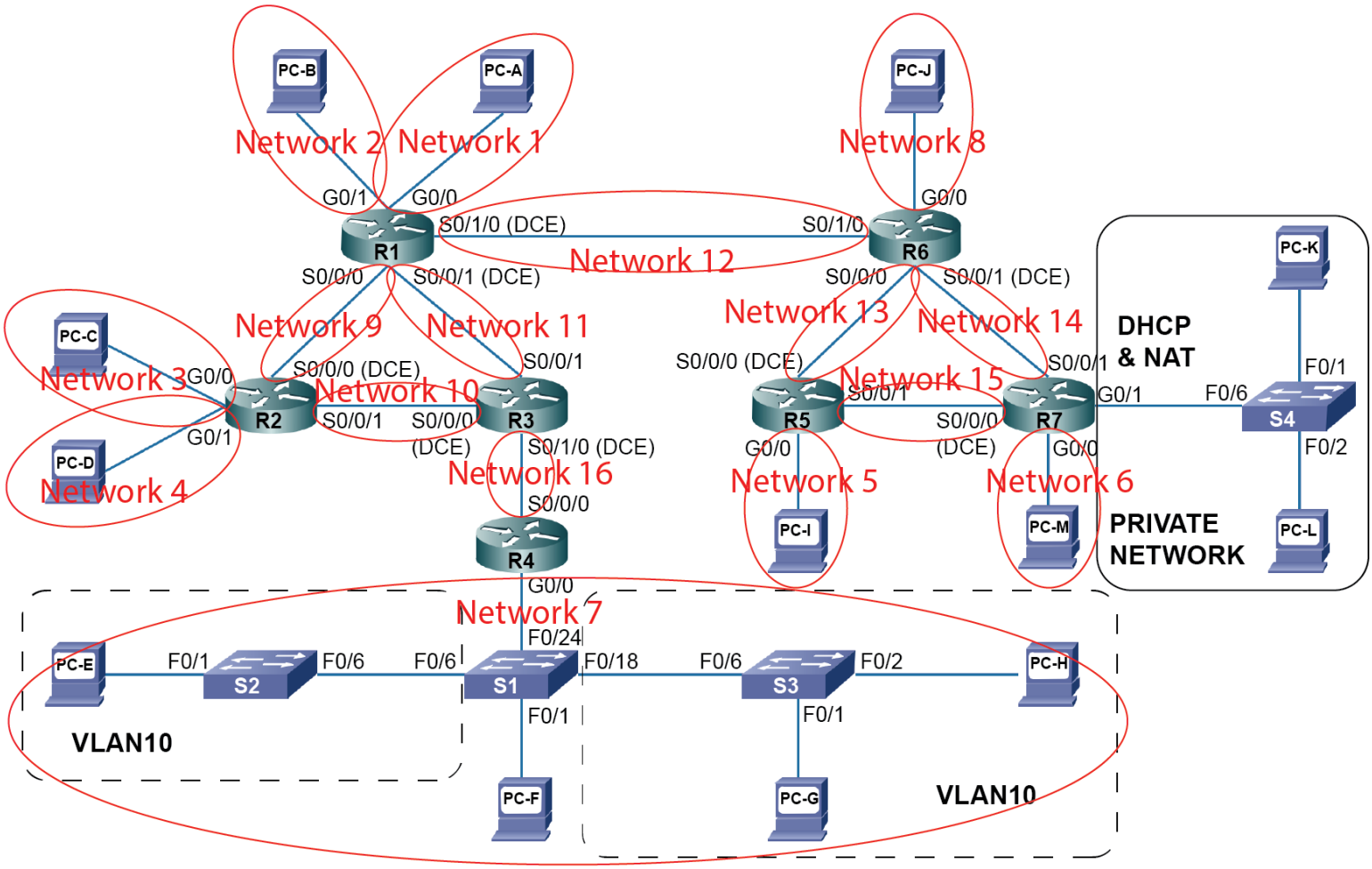
You'll be able to finish it within 1 hour.

The lab exam (packet tracer) will cover all the labs (Lab 1 - Lab 10).

Topology



Topology showing Network Number



Addressing Table for switches and routers

Device	Interface	IP Address	Subnet Mask
R1	G0/0		
	G0/1		
	S0/0/0		
	S0/0/1		
	S0/1/0 (DCE)		
R2	G0/0		
	G0/1		
	S0/0/0 (DCE)		
	S0/0/1 (DCE)		
R3	S0/0/0 (DCE)		
	S0/0/1		
	S0/1/0 (DCE)		
R4	G0/0		
	S0/0/0		
R5	G0/0		
	S0/0/0 (DCE)		

	S0/0/1		
R6	G0/0		
	S0/0/0		
	S0/0/1 (DCE)		
	S0/1/0		
R7	G0/0		
	G0/1		
	S0/0/0 (DCE)		
	S0/0/1		

Addressing Table for PCs

Device	IP Address	Subnet Mask	Default Gateway
PC-A			
PC-B			
PC-C			
PC-D			
PC-E			
PC-F			
PC-G			
PC-H			
PC-I			
PC-J			
PC-K	DHCP	DHCP	DHCP
PC-L	DHCP	DHCP	DHCP
PC-M			

Subnet Information

Network	Number of host IP Address	Network Address / CDIR	First Usable Address	Broadcast Address
Network 1				
Network 2				
Network 3				
Network 4				
Network 5				
Network 6				

Network 7				
Network 8				
Network 9				
Network 10				
Network 11				
Network 12				
Network 13				
Network 14				
Network 15				
Network 16				
Network 17				

Background

You are a network administrator at a university. The university has received "161.200.0.0/16" network. As a network administrator, you have to distribute the IP addresses to each faculty. The topology shows network inside the university. Router R1 to R4 are in Campus A of the university, router R5 to R7 are in Campus B of the university. In Campus A, you decide to use static route. In Campus B, you decide to use OSPF dynamic route.

In Campus A, there are two computer laboratory that are always used as exam room. Each exam room has a switch for their own room (S2 and S3). Each of the computer in 2 laboratories can communicate among themselves, but cannot communicate with the hosts outside the room. So you decide to assign VLAN to the 2 rooms.

In Campus B, there are a student dormitory. Since there are a lot of students stays in the dormitory, the public IP addresses are not enough for all the students. As a network administrator, you create a private network and use class A IP addresses. As you use a private network, you have to do NAT configuration to make the private network able to use the internet. Moreover, the students might not have skills to assign IP addresses themselves, so you also do DHCP configuration. As a result, the students in the dormitory can use the internet without configuring static IP address.

Since there are a lot of subnets in the university, dividing equally subnets may result in IP address shortage. So, you decide to use VLSM technique to assign IP addresses to each subnet.

Instructions

1. The topology shows the network inside a university. The university has received "161.200.0.0/16" network. Since the number of hosts for each network is different, you'll divide the IP address into different sizes. Use VLSM technique to assign IP address to each network.
    a. Network 1 has 32,000 hosts.
    Network 2 has 16,000 hosts.
    Network 3 has 8,000 hosts.
    Network 4 has 4,000 hosts.
    Network 5 has 2,000 hosts.
    Network 6 has 1,000 hosts.
    Network 7 has 500 hosts.
    Network 8 has 250 hosts.
    b. From number of hosts described in previous bullet, subnet "161.200.0.0/16" network using VLSM technique to assign appropriate subnet mask to each subnet. Use the first subnet id for each network and use the second subnet id for dividing next network.
    c. For network 1 to 8, assign first host IP address for router gigabit interface, second host IP address for host. If there are more than 1 host, assign less IP to the host which character comes first.
    d. Network 9 to 16 are serial link, and create one more subnet which has the same size as Network 9 to 16 for NAT. We call the last network as Network 17.

e. Continue subnetting the first subnet of each new subnet until you have appropriate subnet mask to assign to each network.
f. For network 9 to 16, assign first host IP address to the router that has less number.
g. For private network, we use private class A IP address.

2. Cable the devices as shown in the topology. (You should use appropriate type of cable.)
3. Configure basic routers and switches
   a. Disable DNS lookup.
   b. Configure device name as shown in the topology.
   c. Enable password encryption.
   d. Assign **ciscoexe** as the privileged EXEC password.
   e. Assign **ciscocon** as the console password.
   f. Configure **logging synchronous** for the console line.
   g. Assign **ciscovty** as the vty passwords.
   h. Configure a message of the day (MOTD) banner as "**Unauthorized access is prohibited.**" (without " character)
   i. Configure the IP address listed in the Addressing Table for all interfaces.
   j. Set the clock rate for all DCE serial interfaces at **128000**.
   k. Copy the running configuration to the startup configuration.
4. Configure PC hosts
   a. Assign IP addresses to all PCs except PC-K and PC-L that has the DHCP.
5. Configure static route and default route on R1, R2, R3, R4 using **exit interface** only.
   a. R1
      i. Route to Network 3, 4, 10 exit on s0/0/0
      ii. Route to Network 7, 16 exit on S0/0/1
      iii. Default route exit on S0/1/0
   b. R2
      i. Route to Network 1, 2 and default route exit on S0/0/0
      ii. Route to Network 7, 11, 16 exit on S0/0/1
   c. R3
      i. Route to Network 1, 2 and default route exit on S0/0/0
      ii. Route to Network 3, 4, 9 exit on S0/0/1
      iii. Route to Network 7 exit on S0/1/0
   d. R4
      i. Route to Network 1, 2, 3, 4, 9, 10, 11 and default route exit on S0/0/0
6. Configure OSPF routing and default route on R5, R6, R7 with process id 1
   a. Prevent routing update from being sent to all the interfaces that don't connect to routers.
   b. R5
      i. Advertise OSPF routing to all networks on area 0
      ii. Default route exit on S0/0/0
   c. R6
      i. Advertise OSPF routing to all networks on area 0
      ii. Default route exit on S0/1/0
   d. R7
      i. Advertise OSPF routing to all networks (include private network) on area 0
      ii. Default route exit on S0/0/1
7. Disable all unused interfaces on S1, S2, S3 and S4.
8. Configure VLAN on S1, S2, S3
   a. Create VLAN 10 on S1, S2, S3 and assign the name **VLAN10**.
   b. Assign interface F0/6 and F0/18 on S1 to VLAN10. The other interfaces on S1 are still in default VLAN.
   c. Assign all interfaces on S2 and S3 to VLAN10.
9. Configure DHCP on R7
   a. The DHCP will distribute class A private network.
   b. Exclude the first 9 addresses to be distributed by DHCP.
   c. Use the pool name **R7S4**
   d. When the DHCP distribute IP address, assign the default gateway to the first private host IP address.
10. Configure dynamic NAT on R7 to allow mapping between public and private network.
    a. Specify the ports. Only g0/1 is inside NAT, the other ports are outside NAT.
    b. Define access control list 1 to allow private network to be translated.
    c. Define the pool of usable public IP addresses as Network 17.
    d. Define the NAT from the inside source list to the outside pool.
11. Copy the running configuration to the startup configuration for all routers and switches.

Answer the questions

1. Fill in the table for DHCP assignment.

Device	IP Address	Subnet Mask	Default Gateway
PC-K			

PC-L			

2. Can each PC ping each other? Each cell[i][j] denotes that host i can ping host j or not. Fill **O** if it can ping, **X** if it cannot ping.

	PC-A	**PC-B**	**PC-C**	**PC-D**	**PC-E**	**PC-F**	**PC-G**	**PC-H**	**PC-I**	**PC-J**	**PC-K**	**PC-L**	**PC-M**
PC-A	O												
PC-B		O											
PC-C			O										
PC-D				O									
PC-E					O								
PC-F						O							
PC-G							O						
PC-H								O					
PC-I									O				
PC-J										O			
PC-K											O		
PC-L												O	
PC-M													O

3. Which type of cables are used to connect each type of devices?

	PC	**Switch**	**Router**
PC			
Switch			
Router			