

# Q1

1. R1 acts as Cisco IOS DHCPv4 server assigns and manages IPv4 addresses from specified address pools within the router to DHCPv4 clients. You are required to exclude first 5 IP addresses from both of the LANs. Write down the commands for R1.

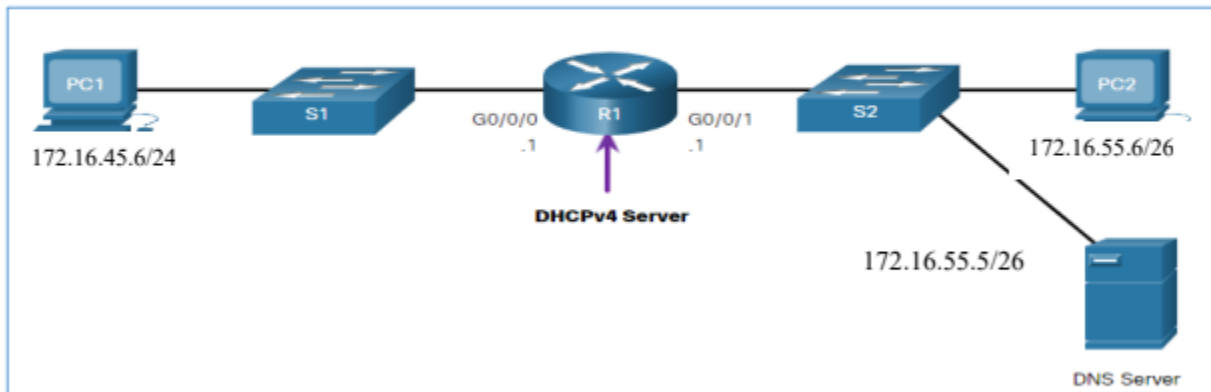


Figure 1-1: A network topology

```
ip dhcp excluded-address 172.16.45.1 172.16.45.6
```

```
ip dhcp excluded-address 172.16.55.1 172.16.55.6
```

```
ip dhcp pool LAN_POOL_1
```

```
network 172.16.45.0 255.255.255.0
```

```
default-router 172.16.45.1
```

```
dns-server 172.16.55.5
```

```
ip dhcp pool LAN_POOL_2
```

```
network 172.16.55.0 255.255.255.192
```

```
default-router 172.16.55.1
```

```
dns-server 172.16.55.5
```

## Q2

2. A network administrator has setup a network topology as shown in Figure2-1 and configures DHCP, Syslog and NTP services as shown in Figure 2-2.

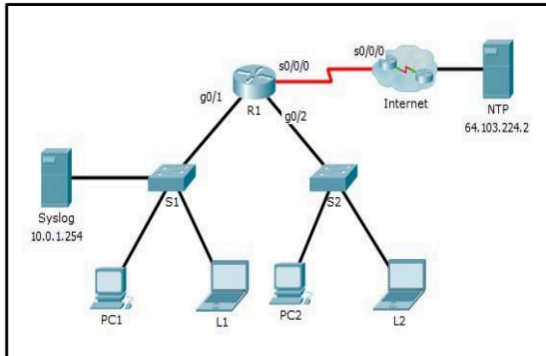


Figure 2-1: A network topology

```
service timestamps log datetime msec
hostname R1

ip dhcp excluded-address 10.0.1.254
ip dhcp excluded-address 10.0.3.1 10.0.3.3
ip dhcp excluded-address 10.0.1.1 10.0.1.2

ip dhcp pool 10.0.1.X
network 10.0.1.0 255.255.255.0
default-router 10.0.1.1

interface GigabitEthernet0/1
ip address 10.0.1.1 255.255.255.0

interface GigabitEthernet0/2
ip address 10.0.3.1 255.255.255.0

interface Serial0/0/0
ip address 209.165.14.2 255.255.255.0

ip route 0.0.0.0 0.0.0.0 Serial0/0/0

ntp server 64.103.224.2 key 0
```

Figure 2-2: Partial output of "show running-config"

- (i) DHCP is not functioning for PC2 and L2 when the network administrator tried to release and renew IP addresses as shown in Figure 2-3. Based on Figure 2-1 and Figure 2-2, **identify** and **rectify** the problem.

```
PC>ipconfig /release

IP Address.....: 0.0.0.0
Subnet Mask.....: 0.0.0.0
Default Gateway.....: 0.0.0.0
DNS Server.....: 0.0.0.0

PC>ipconfig /renew
DHCP request failed.
```

Figure2-3: Sample output of "ipconfig /release" and "ipconfig /renew"

*Missing a dhcp pool for the subnet 10.0.3.0/24 which is the subnet that PC2 in. Configure the dhcp pool for the subnet 10.0.3.0/24 with default gateway (10.0.3.1) using command:*

```
ip dhcp pool 10.0.3.X
network 10.0.3.0 255.255.255.0
default-router 10.0.3.1
```

## Q3

3. CEO of ARMY Sdn. Bhd. has employed you to ensure all the PCs in the company are able to communicate with each other. Assume all the IPv4 addressing, static routing and OSPF configurations are configured in the respective routers. With reference to a network topology shown in Figure 5-1, answer the following questions.

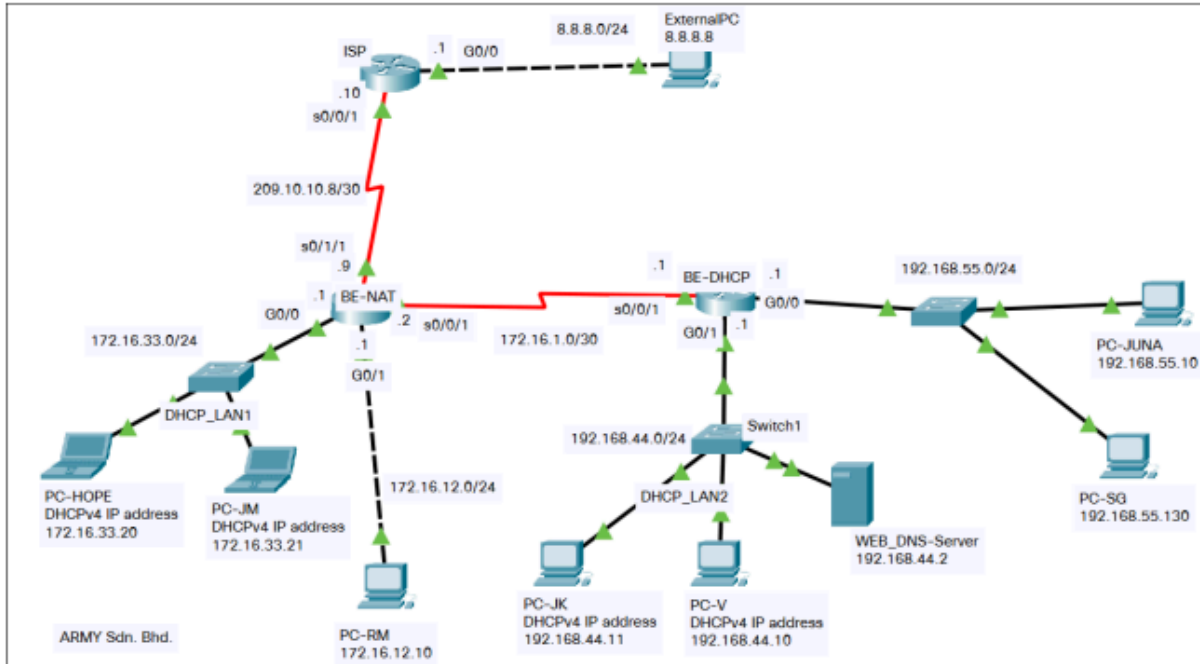


Figure 5-1: A network topology

- a) DHCP (Dynamic Host Configuration Protocol) configurations are to be configured in BE-DHCP router. PC-V, PC-JK, PC-HOPE and PC-JM should obtain the IP addresses and other DHCP configurations automatically from BE-DHCP router as shown in Figure 5-1. Use Table 5-1 to document the DHCP configurations with justifications. (16 marks)

Table 5-1: Documentation Table

Router name	Configurations	Justifications

Router Name	Configuration	Justification
BE_DHCP	<pre>ip dhcp excluded-address 172.16.33.1 172.16.33.9 ip dhcp excluded-address 192.168.44.1 192.168.44.19  ip dhcp pool DHCP_LAN1 network 172.16.33.0 255.255.255.0</pre>	Excluded reserved address (static address) for router, switches and other devices.

	<i>default-router 172.16.33.1</i> <i>dns-server 192.168.44.2</i>  <i>ip dhcp pool DHCP_LAN2</i> <i>network 172.168.44.0 255.255.255.0</i> <i>default-router 172.16.1.0</i> <i>dns-server 192.168.44.2</i>	<i>Need DHCP pool for the BE_NAT interface g0/0 network and DHCP pool for BE_DHXP g0.1 network.</i>
<i>BE_NAT</i>	<i>interface s0/0/1</i> <i>ip dhcp-helper 172.16.1.1</i>	<i>Not on same subnet, need to relay to DHCP server</i>

## Q4 (my, jw, yx)

Q4. With reference to a network topology shown in Figure 4-1 and output of “show run” configurations in Figure 4-2, answer the followings.

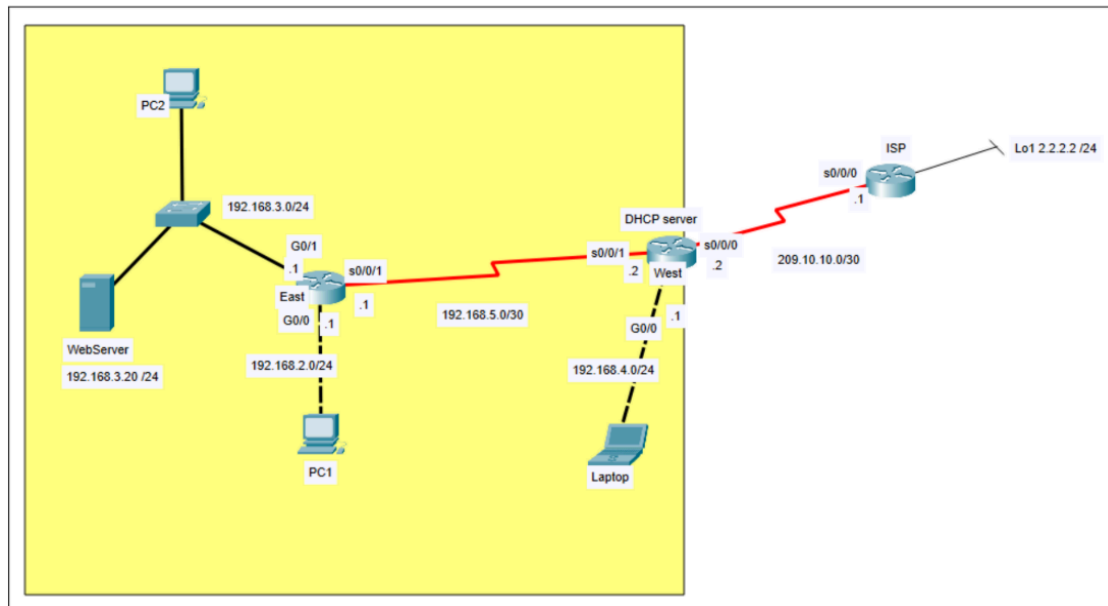


Figure 4-1: A network topology

East	West
<pre> interface GigabitEthernet0/0 ip address 192.168.2.1 255.255.255.0  interface GigabitEthernet0/1 ip address 192.168.3.1 255.255.255.0  interface Serial0/0/1 ip address 192.168.5.1 255.255.255.252 clock rate 64000 </pre>	<pre> ip dhcp excluded-address 192.168.2.1 192.168.2.10 ip dhcp excluded-address 192.168.3.1 192.168.3.10 ip dhcp excluded-address 192.168.4.1 192.168.4.10  ip dhcp pool EastG0/0 network 192.168.2.0 255.255.255.0  ip dhcp pool EastG0/1 network 192.168.3.0 255.255.255.0  ip dhcp pool WestG0/0 network 192.168.4.0 255.255.255.0  interface GigabitEthernet0/0 ip address 192.168.4.1 255.255.255.0  interface Serial0/0/0 ip address 209.10.10.2 255.255.255.252  interface Serial0/0/1 ip address 192.168.5.2 255.255.255.252  ip route 0.0.0.0 0.0.0.0 Serial0/0/0 </pre>

Figure 4-2: Output of “show run” command

- a) DHCP (Dynamic Host Control Protocol) server configurations were configured in the West router. PC1, PC2 and Laptop were unable to obtain the IP addresses and other DHCP configurations successfully. Evaluate the DHCP configurations in Figures 4-1 and 4-2. Use Table 4-1 to document the identified errors, provide the solutions/correct configurations for the respective errors and lastly justified your answers. (9 marks)

Table 4-1: Documentation Table

Item	Problems	Solutions	Justifications
(i)			
(ii)			

<i>Item</i>	<i>Problems</i>	<i>Solutions</i>	<i>Justification</i>
<i>i)</i>	<i>Missing gateway for all dhcp pool in Router West</i>	<i>ip dhcp pool EastG0/0 default-router 192.168.2.1 ip dhcp pool EastG0/1 default-router 192.168.3.1 ip dhcp pool WestG0/0 default-router 192.168.4.1</i>	<i>Add in the command to configure the default-gateway with 192.168.2.1 for the dhcp pool</i>
<i>iv)</i>	<i>Missing configure ip dhcp helper at Router East</i>	<i>interface g0/0 ip dhcp-helper 192.168.5.2 interface g0/1 ip dhcp-helper 192.168.5.2</i>	<i>Configure the dhcp helper on Router East's interface S0/0/1 and the helper IP is the Router West IP address in the subnet</i>
<i>v)</i>	<i>Missing to exclude the web server ip address at Router West</i>	<i>ip dhcp pool excluded-address 192.168.3.20</i>	<i>Configure the command in Router West to exclude the IP address from the dhcp pool</i>

## Q5

Q5. Pass year question 202301

OSPF and static routing are implemented in the respective routers as shown in Figure 3-1 network topology. All devices can communicate with each other. With reference to Figure 3-1, answer the following questions.

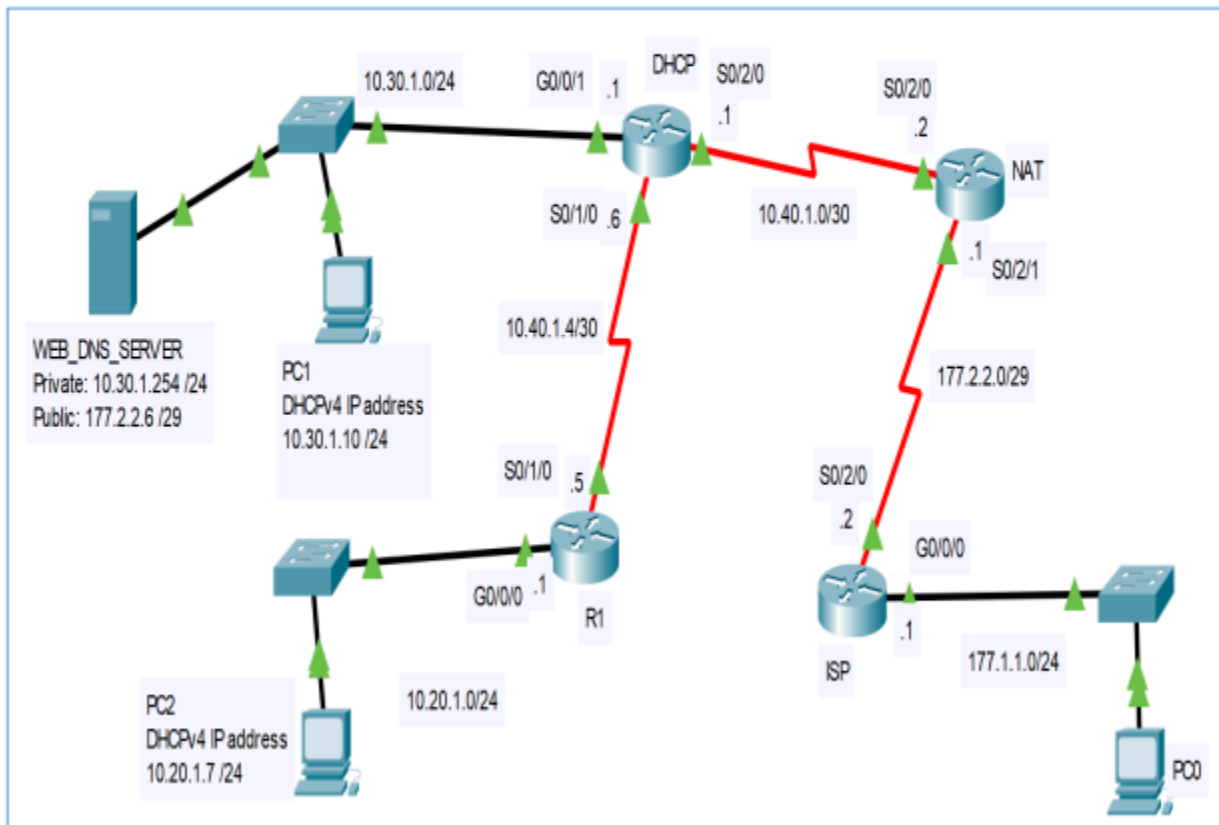


Figure 3-1: A network topology

DHCP	R1
ip dhcp excluded-address 10.30.1.1 10.30.1.9	interface GigabitEthernet0/0/0
ip dhcp pool DHCP	ip address 10.20.1.1 255.255.255.0
network 10.10.1.0 255.255.255.0	interface Serial0/1/0
dns-server 10.30.1.254	ip address 10.40.1.5 255.255.255.252
interface GigabitEthernet0/0/1	:
ip address 10.30.1.1 255.255.255.0	:
interface Serial0/1/0	
ip address 10.40.1.6 255.255.255.252	
clock rate 2000000	
interface Serial0/2/0	
ip address 10.40.1.1 255.255.255.252	
clock rate 2000000	
:	
:	

Figure 3-2: Partial output of “show run” commands

DHCP (Dynamic Host Configuration Protocol) server configurations are implemented in **DHCP** router. PC1 and PC2 were unable to obtain the IP addresses and other DHCP configurations successfully. Analyze the DHCP configurations in Figures 3-1 and 3-2. Use Table 3-1 to document all errors, provide the solutions/correct configurations for the respective errors and lastly justified your answers. State your assumptions in your answers.

Table 3-1: Documentation Table

Items	Errors	Solutions	Justifications

(12 marks)

<i>Item</i>	<i>Errors</i>	<i>Solution</i>	<i>Justification</i>
<i>DHCP</i>	<i>Wrong network address for the ip dhcp pool</i>	<i>network 10.30.1.0 255.255.255.0</i>	<i>the ACL is belong to the network address</i>
<i>DHC{</i>	<i>Missing the default-router in DHCP pool</i>	<i>default-router 10.30.1.1</i>	<i>Configure default gateway for PC1 able to send packet to remote network</i>
<i>R1</i>	<i>Missing ip dhcp</i>	<i>ip dhcp</i>	<i>Configure excluded</i>

	<i>excluded-address</i>	<i>excluded-address 10.20.1.1 10.20.1.6</i>	<i>ip address in to let these address assigned to other devices</i>
<i>R1</i>	<i>Missing the DHCP v4 pool name Missing the address pool</i>	<i>ip dhcp pool R1 network 10.20.1.0 255.255.255.0 default-router 10.20.1.1 dns-server 10.20.1.254</i>	<i>There are the required for configure DHCP server</i>
<i>R1</i>	<i>Missing ip helper address</i>	<i>int g0/0/0 ip helper-address 10.40.1.6</i>	<i>Configure relay DHCPv4 message to DHCP</i>