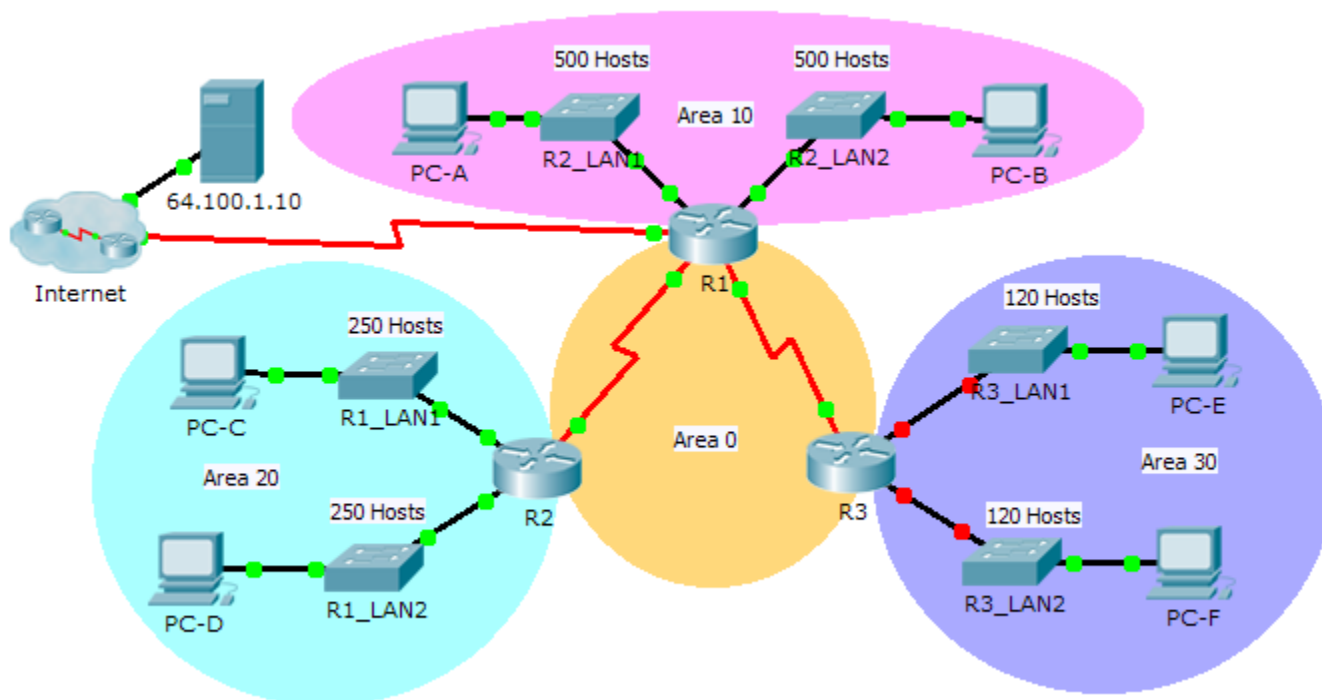


Packet Tracer – Skills Integration Challenge (Instructor Version)

Instructor Note: Red font color or Gray highlights indicate text that appears in the instructor copy only.

Topology



Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	G0/0	172.31.25.254	255.255.254.0	N/A
	G0/1	172.31.27.254	255.255.254.0	N/A
	S0/0/0	172.31.31.249	255.255.255.252	N/A
	S0/0/1	172.31.31.253	255.255.255.252	N/A
	S0/1/0	209.165.201.2	255.255.255.252	N/A
R2	G0/0	172.31.28.254	255.255.255.0	N/A
	G0/1	172.31.29.254	255.255.255.0	N/A
	S0/0/0	172.31.31.250	255.255.255.252	N/A
R3	G0/0	172.31.30.126	255.255.255.128	N/A
	G0/1	172.31.30.254	255.255.255.128	N/A
	S0/0/1	172.31.31.254	255.255.255.252	N/A
PC-A	NIC	172.31.24.1	255.255.254.0	172.31.25.254
PC-B	NIC	172.31.26.1	255.255.254.0	172.31.27.254
PC-C	NIC	172.31.28.1	255.255.255.0	172.31.28.254
PC-D	NIC	172.31.29.1	255.255.255.0	172.31.29.254
PC-E	NIC	172.31.30.1	255.255.255.128	172.31.30.126
PC-F	NIC	172.31.30.129	255.255.255.128	172.31.30.254

Scenario

As network technician familiar with IPv4 addressing, routing and network security, you are now ready to apply your knowledge and skills to a network infrastructure. Your task is to finish designing the VLSM IPv4 addressing scheme, implement multi-area OSPF and secure access to the VTY lines using access control lists.

Requirements

- The **R3** LANs need addressing. Complete the VLSM design using the next available subnets in the remaining **172.31.30.0/23** address space.
 - Assign the first subnet for 120 hosts to **R3** LAN1.
 - Assign the second subnet for 120 hosts to **R3** LAN2.
- Document your addressing scheme by completing the **Addressing Table**.
 - Assign the last IP address in the subnet to the appropriate **R3** interface.
 - Assign the first IP address in the subnet to the PC.
- Configure addressing for **R3**, **PC-E** and **PC-F**.
- Implement multiarea OSPF using 1 as the process ID.
 - Assign the serial links to OSPF Area 0.

- Configure the router ID as **x.x.x.x** where **x** is the number of the router. For example, the router ID for **R1** is 1.1.1.1.
- Summarize the LANs in each area and advertise them using one network statement.
 - 1) Assign the R1 LANs to OSPF Area 10.
 - 2) Assign the R2 LANs to OSPF Area 20.
 - 3) Assign the R3 LANs to OSPF Area 30.
- Prevent routing updates from being sent out LAN interfaces. Do not use the **default** argument.
- Implement default routing to the Internet.
 - Configure **R1** with a directly attached default route.
 - Advertise the default route to **R2** and **R3**.
- Configure MD5 authentication on the serial interfaces
 - Use **1** as the key.
 - Use **cisco123** as the key string.
- Limit VTY access to **R1**.
 - Configure an ACL number 1.
 - Only **PC-A** is allowed to telnet into **R1**.

```
!-----
!R1
!-----
en
conf t
!
interface Serial0/0/0
 ip ospf message-digest-key 1 md5 cisco123
!
interface Serial0/0/1
 ip ospf message-digest-key 1 md5 cisco123
!
router ospf 1
 router-id 1.1.1.1
 area 0 authentication message-digest
 passive-interface GigabitEthernet0/0
 passive-interface GigabitEthernet0/1
 network 172.31.31.248 0.0.0.3 area 0
 network 172.31.31.252 0.0.0.3 area 0
 network 172.31.24.0 0.0.3.255 area 10
 default-info orig
!
access-list 1 permit host 172.31.24.1
```

```
access-list 1 deny any
!or without the implicit deny is also acceptable
!access-list 1 permit host 172.31.24.1
!
ip route 0.0.0.0 0.0.0.0 s0/1/0
!
line vty 0 15
  access-class 1 in
!
end

!-----
!R2
!-----
!
en
conf t
!
interface Serial0/0/0
  ip ospf message-digest-key 1 md5 cisco123
!
router ospf 1
  router-id 2.2.2.2
  area 0 authentication message-digest
  passive-interface GigabitEthernet0/0
  passive-interface GigabitEthernet0/1
  network 172.31.31.248 0.0.0.3 area 0
  network 172.31.28.0 0.0.1.255 area 20
!
!
end

!-----
!R3
!-----
!
en
conf t
!
interface GigabitEthernet0/0
```

```
ip address 172.31.30.126 255.255.255.128
no shut
!
interface GigabitEthernet0/1
ip address 172.31.30.254 255.255.255.128
no shut
!
interface Serial0/0/1
ip ospf message-digest-key 1 md5 cisco123
!
router ospf 1
router-id 3.3.3.3
area 0 authentication message-digest
passive-interface GigabitEthernet0/0
passive-interface GigabitEthernet0/1
network 172.31.31.252 0.0.0.3 area 0
network 172.31.30.0 0.0.0.255 area 30
!
end
```