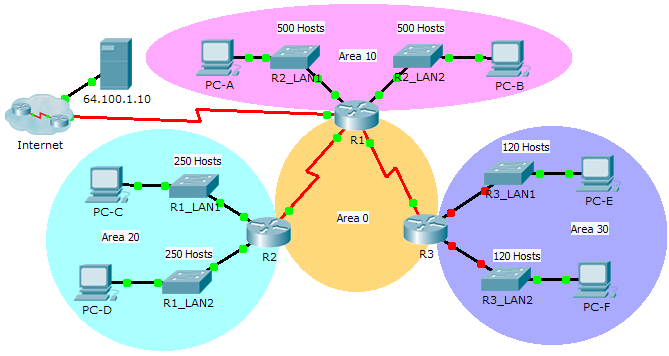
Packet Tracer – Skills Integration Challenge (Instructor Version)

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

1. Topology



1. 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 |

1. 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.

1. 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.
  + - 1. Assign the first subnet for 120 hosts to **R3** LAN1.
      2. Assign the second subnet for 120 hosts to **R3** LAN2.
* Document your addressing scheme by completing the **Addressing Table**.
  1. Assign the last IP address in the subnet to the appropriate **R3** interface.
  2. 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.
  1. Assign the serial links to OSPF Area 0.
  2. 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.
  3. 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.
  4. Prevent routing updates from being sent out LAN interfaces. Do not use the **default** argument.
* Implement default routing to the Internet.
  1. Configure **R1** with a directly attached default route.
  2. Advertise the default route to **R2** and **R3**.
* Configure MD5 authentication on the serial interfaces
  1. Use **1** as the key.
  2. Use **cisco123** as the key string.
* Limit VTY access to **R1**.
  1. Configure an ACL number 1.
  2. 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 implicity 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