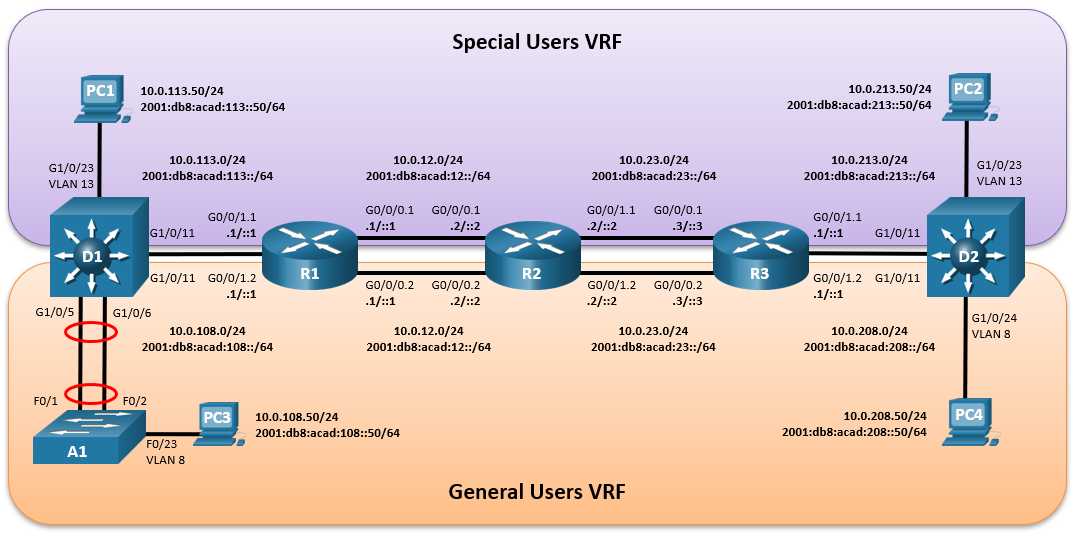
ENCOR Skills Assessment (Scenario 2) (Instructor Version)

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

# Topology



# Addressing Table

| Device | Interface | IPv4 Address | IPv6 Address | IPv6 Link-Local |
| --- | --- | --- | --- | --- |
| R1 | G0/0/0.1 | 10.0.12.1/24 | 2001:db8:acad:12::1/64 | fe80::1:1 |
| R1 | G0/0/0.2 | 10.0.12.1/24 | 2001:db8:acad:12::1/64 | fe80::1:2 |
| R1 | G0/0/1.1 | 10.0.113.1/24 | 2001:db8:acad:113::1/64 | fe80::1:3 |
| R1 | G0/0/1.2 | 10.0.108.1/24 | 2001:db8:acad:108::1/64 | fe80::1:4 |
| R2 | G0/0/0.1 | 10.0.12.2/24 | 2001:db8:acad:12::2/64 | fe80::2:1 |
| R2 | G0/0/0.2 | 10.0.12.2/24 | 2001:db8:acad:12::2/64 | fe80::2:2 |
| R2 | G0/0/1.1 | 10.0.23.2/24 | 2001:db8:acad:23::2/64 | fe80::2:3 |
| R2 | G0/0/1.2 | 10.0.23.2/24 | 2001:db8:acad:23::2/64 | fe80::2:4 |
| R3 | G0/0/0.1 | 10.0.23.3/24 | 2001:db8:acad:23::3/64 | fe80::3:1 |
| R3 | G0/0/0.2 | 10.0.23.3/24 | 2001:db8:acad:23::3/64 | fe80::3:2 |
| R3 | G0/0/1.1 | 10.0.213.1/24 | 2001:db8:acad:213::1/64 | fe80::3:3 |
| R3 | G0/0/1.2 | 10.0.208.1/24 | 2001:db8:acad:208::1/64 | fe80::3:4 |
| PC1 | NIC | 10.0.113.50/24 | 2001:db8:acad:113::50/64 | EUI-64 |
| PC2 | NIC | 10.0.213.50/24 | 2001:db8:acad:213::50/64 | EUI-64 |
| PC3 | NIC | 10.0.108.50/24 | 2001:db8:acad:108::50/64 | EUI-64 |
| PC4 | NIC | 10.0.208.50/24 | 2001:db8:acad:208::50/64 | EUI-64 |

# Objectives

Part 1: Build the Network and Configure Basic Device Settings.

Part 2: Configure VRF and Static Routing

Part 3: Configure L2 Network

Part 4: Configure Security

Part 5: Cleanup

# Background / Scenario

In this skills assessment, you are responsible for completing the multi-VRF configuration of the network supporting “General Users” and “Special Users”. Upon completion, there should be full end-to-end reachability and the two groups should not be able to communicate with each other. Be sure to verify that your configurations meet the provided specifications and that the devices perform as required.

**Note**: The routers used with CCNP hands-on labs are Cisco 4221s with Cisco IOS XE Release 16.9.4 (universalk9 image). The switches used in the labs are Cisco Catalyst 3650s with Cisco IOS XE Release 16.9.4 (universalk9 image) and Cisco Catalyst 2960s with Cisco IOS Release 15.2(2) (lanbasek9 image). Other routers, switches, and Cisco IOS versions can be used. Depending on the model and Cisco IOS version, the commands available and the output produced might vary from what is shown in the labs.

**Note**: Make sure that the switches have been erased and have no startup configurations. If you are unsure, contact your instructor.

**Note:** The default Switch Database Manager (SDM) template on a Catalyst 2960 does not support IPv6. You must change the default SDM template to the dual-ipv4-and-ipv6 default template using the **sdm prefer dual-ipv4-and-ipv6 default** global configuration command. Changing the template will require a reboot.

**Instructor Note**: Refer to the Instructor Lab Manual for the procedures to initialize and reload devices.

**Instructor Note**:This skills assessment presumes that Part 1: Build the Network and Configure Basic Device Settings and Interface Addressing is not a graded or timed component of the exercise.

**Instructor Note**: In the interest of time, it may be appropriate to modify some of the requirements from “all devices” to a select device.

# Required Resources

* 3 Routers (Cisco 4221 with Cisco IOS XE Release 16.9.4 universal image or comparable)
* 2 Switches (Cisco 3650 with Cisco IOS XE release 16.9.4 universal image or comparable)
* 1 Switch (Cisco 2960 with Cisco IOS release 15.2 lanbase image or comparable)
* 4 PCs (Choice of operating system with a terminal emulation program)
* Console cables to configure the Cisco IOS devices via the console ports
* Ethernet cables as shown in the topology

# Instructions

## Build the Network and Configure Basic Device Settings and Interface Addressing

In Part 1, you will set up the network topology and configure basic settings.

### Cable the network as shown in the topology.

Attach the devices as shown in the topology diagram, and cable as necessary.

### Configure basic settings for each device.

* + 1. Console into each device, enter global configuration mode, and apply the basic settings. The startup configurations for each device are provided below.

Router R1

hostname R1

ipv6 unicast-routing

no ip domain lookup

banner motd # R1, ENCOR Skills Assessment, Scenario 2 #

line con 0

exec-timeout 0 0

logging synchronous

exit

Router R2

hostname R2

ipv6 unicast-routing

no ip domain lookup

banner motd # R2, ENCOR Skills Assessment, Scenario 2 #

line con 0

exec-timeout 0 0

logging synchronous

exit

Router R3

hostname R3

ipv6 unicast-routing

no ip domain lookup

banner motd # R3, ENCOR Skills Assessment, Scenario 2 #

line con 0

exec-timeout 0 0

logging synchronous

exit

Switch D1

hostname D1

ip routing

ipv6 unicast-routing

no ip domain lookup

banner motd # D1, ENCOR Skills Assessment, Scenario 2 #

line con 0

exec-timeout 0 0

logging synchronous

exit

vlan 8

name General-Users

exit

vlan 13

name Special-Users

exit

Switch D2

hostname D2

ip routing

ipv6 unicast-routing

no ip domain lookup

banner motd # D2, ENCOR Skills Assessment, Scenario 2 #

line con 0

exec-timeout 0 0

logging synchronous

exit

vlan 8

name General-Users

exit

vlan 13

name Special-Users

exit

Switch A1

hostname A1

ipv6 unicast-routing

no ip domain lookup

banner motd # A1, ENCOR Skills Assessment, Scenario 2 #

line con 0

exec-timeout 0 0

logging synchronous

exit

vlan 8

name General-Users

exit

* + 1. Save the running configuration to startup-config on all devices.
    2. Configure PC1, PC2, PC3, and PC4 host addressing as shown in the addressing table.

## Configure VRF and Static Routing

In this part of the Skills Assessment, you will configure VRF-Lite on all three routers and the appropriate static routes to support end-to-end reachability. At the end of this part, R1 should be able to ping R3 in each VRF.

Your configuration tasks are as follows:

| Task# | Task | Specification | Points |
| --- | --- | --- | --- |
| 2.1 | On R1, R2, and R3, configure VRF-Lite VRFs as shown in the topology diagram. | Configure two VRFs:   * General-Users * Special-Users   The VRFs must support IPv4 and IPv6. | 12 |
| 2.2 | On R1, R2, and R3, configure IPv4 and IPv6 interfaces on each VRF as detailed in the addressing table above. | All routers will use Router-On-A-Stick on their G0/0/1.x interfaces to support separation of the VRFs.  Sub-interface 1:   * In the Special Users VRF * Use dot1q encapsulation 13 * IPv4 and IPv6 GUA and link-local addresses * Enable the interfaces   Sub-interface 2:   * In the General Users VRF * Use dot1q encapsulation 8 * IPv4 and IPv6 GUA and link-local addresses * Enable the interfaces | 12 |
| 2.3 | On R1 and R3, configure default static routes pointing to R2. | Configure VRF static routes for both IPv4 and IPv6 in both VRFs. | 8 |
| 2.4 | Verify connectivity in each VRF. | From R1, verify connectivity to R3:   * ping vrf General-Users 10.0.208.1 * ping vrf General-Users 2001:db8:acad:208::1 * ping vrf Special-Users 10.0.213.1 * ping vrf Special-Users 2001:db8:acad:213::1 | 4 |

**Note**: R1 will not be able to ping PC2 or PC 4 yet.

**Instructor Verification:**

Verify VRF configuration and address assignment using the **show ip vrf interfaces** command. (Tasks 2.1 and 2.2)

R1# **show ip vrf interfaces**

Interface IP-Address VRF Protocol

Gi0/0/0.2 10.0.12.1 General-Users up

Gi0/0/1.2 10.0.108.1 General-Users up

Gi0/0/0.1 10.0.12.1 Special-Users up

Gi0/0/1.1 10.0.113.1 Special-Users up

R2# **show ip vrf interfaces**

Interface IP-Address VRF Protocol

Gi0/0/1.2 10.0.23.2 General-Users up

Gi0/0/0.2 10.0.12.2 General-Users up

Gi0/0/1.1 10.0.23.2 Special-Users up

Gi0/0/0.1 10.0.12.2 Special-Users up

R3# **show ip vrf interfaces**

Interface IP-Address VRF Protocol

Gi0/0/0.2 10.0.23.3 General-Users up

Gi0/0/1.2 10.0.208.1 General-Users up

Gi0/0/0.1 10.0.23.3 Special-Users up

Gi0/0/1.1 10.0.213.1 Special-Users up

Verify the static routes (Task 2.3)

R1# **show run | inc route**

ip route vrf General-Users 0.0.0.0 0.0.0.0 10.0.12.2

ip route vrf Special-Users 0.0.0.0 0.0.0.0 10.0.12.2

ipv6 route vrf General-Users ::/0 2001:DB8:ACAD:12::2

ipv6 route vrf Special-Users ::/0 2001:DB8:ACAD:12::2

R2# **show run | inc route**

ip route vrf General-Users 10.0.108.0 255.255.255.0 10.0.12.1

ip route vrf General-Users 10.0.208.0 255.255.255.0 10.0.23.3

ip route vrf Special-Users 10.0.113.0 255.255.255.0 10.0.12.1

ip route vrf Special-Users 10.0.213.0 255.255.255.0 10.0.23.3

ipv6 route vrf General-Users 2001:DB8:ACAD:108::/64 2001:DB8:ACAD:12::1

ipv6 route vrf Special-Users 2001:DB8:ACAD:113::/64 2001:DB8:ACAD:12::1

ipv6 route vrf General-Users 2001:DB8:ACAD:208::/64 2001:DB8:ACAD:23::3

ipv6 route vrf Special-Users 2001:DB8:ACAD:213::/64 2001:DB8:ACAD:23::3

R3# **show run | inc route**

ip route vrf General-Users 0.0.0.0 0.0.0.0 10.0.23.2

ip route vrf Special-Users 0.0.0.0 0.0.0.0 10.0.23.2

ipv6 route vrf Special-Users ::/0 2001:DB8:ACAD:23::2

ipv6 route vrf General-Users ::/0 2001:DB8:ACAD:23::2

Verify IPv4 and IPv6 pings of R3 from R1; all pings should be successful. (Task 2.4)

R1# **ping vrf General-Users 10.0.208.1**

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.0.208.1, timeout is 2 seconds:

!!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms

R1# **ping vrf General-Users 2001:db8:acad:208::1**

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 2001:DB8:ACAD:208::1, timeout is 2 seconds:

!!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms

R1# **ping vrf Special-Users 10.0.213.1**

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.0.213.1, timeout is 2 seconds:

!!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/2 ms

R1# **ping vrf Special-Users 2001:db8:acad:213::1**

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 2001:DB8:ACAD:213::1, timeout is 2 seconds:

!!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms

## Configure L2 Network

In this part, you will configure the switches to support host connectivity.

Your configuration tasks are as follows:

| Task# | Task | Specification | Points |
| --- | --- | --- | --- |
| 3.1 | On D1, D2, and A1, disable all interfaces. | On D1 and D2, shutdown G1/0/1 to G1/0/24.  On A1, shutdown F0/1 – F0/24, G0/1 – G0/2. | 2 |
| 3.2 | On D1 and D2, configure the trunk links to R1 and R3. | Configure and enable the G1/0/11 link as a trunk link. | 4 |
| 3.3 | On D1 and A1, configure the EtherChannel. | On D1, configure and enable:   * Interface G1/0/5 and G1/0/6 * Port Channel 1 using PAgP   On A1, configure enable:   * Interface F0/1 and F0/2 * Port Channel 1 using PAgP | 8 |
| 3.4 | On D1, D2, and A1, configure access ports for PC1, PC2, PC3, and PC4. | Configure and enable the access ports as follows:   * On D1, configure interface G1/0/23 as an access port in VLAN 13 and enable Portfast. * On D2, configure interface G1/0/23 as an access port in VLAN 13 and enable Portfast. * On D2, configure interface G1/0/24 as an access port in VLAN 8 and enable Portfast. * On A1, configure interface F0/23 as an access port in VLAN 8 and enable Portfast. | 6 |
| 3.5 | Verify PC to PC connectivity. | From PC1, verify IPv4 and IPv6 connectivity to PC2.  From PC3, verify IPv4 and IPv6 connectivity to PC4. | 4 |

**Instructor Verification:**

Issue the command **show interfaces trunk** to verify trunk connectivity and settings.

D1# **show interfaces trunk**

Port Mode Encapsulation Status Native vlan

Gi1/0/11 on 802.1q trunking 1

Po1 on 802.1q trunking 1

Port Vlans allowed on trunk

Gi1/0/11 1-4094

Po1 1-4094

Port Vlans allowed and active in management domain

Gi1/0/11 1,8,13

Po1 1,8,13

Port Vlans in spanning tree forwarding state and not pruned

Gi1/0/11 1,8,13

Po1 1,8,13

Issue the command **show etherchannel summary** to verify the etherchannel settings.

D1# **show etherchannel summary**

Flags: D - down P - bundled in port-channel

I - stand-alone s - suspended

H - Hot-standby (LACP only)

R - Layer3 S - Layer2

U - in use f - failed to allocate aggregator

M - not in use, minimum links not met

u - unsuitable for bundling

w - waiting to be aggregated

d - default port

A - formed by Auto LAG

Number of channel-groups in use: 1

Number of aggregators: 1

Group Port-channel Protocol Ports

------+-------------+-----------+-----------------------------------------------

1 Po1(SU) PAgP Gi1/0/5(P) Gi1/0/6(P)

Issue the command **show run interface g1/0/23** or **show run interface f0/23** to validate host port settings.

D1# **show run interface g1/0/23**

Building configuration...

Current configuration : 114 bytes

!

interface GigabitEthernet1/0/23

switchport access vlan 13

switchport mode access

spanning-tree portfast

Verify that PC1 can reach PC2. IPv4 and IPv6 pings from PC1 to PC2 are successful.

Verify that PC3 can reach PC4. IPv4 and IPv6 pings from PC3 to PC4 are successful.

**Note**: PC1 and PC2 cannot ping PC3 or PC4.

## Configure Security

In this part you will configure various security mechanisms on the devices in the topology.

Your configuration tasks are as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| Task# | Task | Specification | Points |
| 5.1 | On all devices, secure privileged EXE mode. | Configure an enable secret as follows:   * Algorithm type: **SCRYPT** * Password:  **cisco12345cisco**. | 6 |
| 5.2 | On all devices, create a local user account. | Configure a local user:   * Name: **admin** * Privilege level: **15** * Algorithm type: **SCRYPT** * Password:  **cisco12345cisco**. | 6 |
| 5.3 | On all devices, enable AAA and enable AAA authentication. | Enable AAA authentication using the local database on all lines. | 2 |

**Instructor Verification:**

Issue the command **show run | include aaa|username** to verify that the AAA settings are configured.

D2# **show run | include aaa|username**

aaa new-model

aaa authentication login default local

aaa session-id common

username admin privilege 15 secret 9 $9$XjgowiPNCh.RRk$CwCEW/a6DqO12aRmLFaBfhhJPW.V/7KuJaqHS5m4RmU

## Cleanup

NOTE: DO NOT PROCEED WITH CLEANUP UNTIL YOUR INSTRUCTOR HAS GRADED YOUR SKILLS ASSESSMENT AND HAS INFORMED YOU THAT YOU MAY BEGIN CLEANUP.

Unless directed otherwise by the instructor, restore host computer network connectivity, and then turn off power to the host computers.

Remove NVRAM configuration files (if saved) and vlan databases from all devices before turning them off or reloading them.

End of document

# Device Configurations (Answers)

**Listed below are the configuration commands used to create the skills assessment**

# Part 2: VRF and Static Routing (student configures)

# Router R1

vrf definition General-Users

address-family ipv4

address-family ipv6

exit

vrf definition Special-Users

address-family ipv4

address-family ipv6

exit

interface g0/0/0.1

encapsulation dot1q 13

vrf forwarding Special-Users

ip address 10.0.12.1 255.255.255.0

ipv6 address fe80::1:1 link-local

ipv6 address 2001:db8:acad:12::1/64

no shutdown

exit

interface g0/0/0.2

encapsulation dot1q 8

vrf forwarding General-Users

ip address 10.0.12.1 255.255.255.0

ipv6 address fe80::1:2 link-local

ipv6 address 2001:db8:acad:12::1/64

no shutdown

exit

interface g0/0/0

no ip address

no shutdown

exit

interface g0/0/1.1

encapsulation dot1q 13

vrf forwarding Special-Users

ip address 10.0.113.1 255.255.255.0

ipv6 address fe80::1:3 link-local

ipv6 address 2001:db8:acad:113::1/64

no shutdown

exit

interface g0/0/1.2

encapsulation dot1q 8

vrf forward General-Users

ip address 10.0.108.1 255.255.255.0

ipv6 address fe80::1:4 link-local

ipv6 address 2001:db8:acad:108::1/64

no shutdown

exit

interface g0/0/1

no ip address

no shutdown

exit

ip route vrf Special-Users 0.0.0.0 0.0.0.0 10.0.12.2

ip route vrf General-Users 0.0.0.0 0.0.0.0 10.0.12.2

ipv6 route vrf Special-Users ::/0 2001:db8:acad:12::2

ipv6 route vrf General-Users ::/0 2001:db8:acad:12::2

end

# Router R2

vrf definition General-Users

address-family ipv4

address-family ipv6

exit

vrf definition Special-Users

address-family ipv4

address-family ipv6

exit

interface g0/0/0.1

encapsulation dot1q 13

vrf forwarding Special-Users

ip address 10.0.12.2 255.255.255.0

ipv6 address fe80::2:1 link-local

ipv6 address 2001:db8:acad:12::2/64

no shutdown

exit

interface g0/0/0.2

encapsulation dot1q 8

vrf forwarding General-Users

ip address 10.0.12.2 255.255.255.0

ipv6 address fe80::2:2 link-local

ipv6 address 2001:db8:acad:12::2/64

no shutdown

exit

interface g0/0/0

no ip address

no shutdown

exit

interface g0/0/1.1

encapsulation dot1q 13

vrf forwarding Special-Users

ip address 10.0.23.2 255.255.255.0

ipv6 address fe80::2:3 link-local

ipv6 address 2001:db8:acad:23::2/64

no shutdown

exit

interface g0/0/1.2

encapsulation dot1q 8

vrf forwarding General-Users

ip address 10.0.23.2 255.255.255.0

ipv6 address fe80::2:4 link-local

ipv6 address 2001:db8:acad:23::2/64

no shutdown

exit

interface g0/0/1

no ip address

no shutdown

exit

ip route vrf Special-Users 10.0.113.0 255.255.255.0 10.0.12.1

ip route vrf Special-Users 10.0.213.0 255.255.255.0 10.0.23.3

ipv6 route vrf Special-Users 2001:db8:acad:113::/64 2001:db8:acad:12::1

ipv6 route vrf Special-Users 2001:db8:acad:213::/64 2001:db8:acad:23::3

ip route vrf General-Users 10.0.108.0 255.255.255.0 10.0.12.1

ip route vrf General-Users 10.0.208.0 255.255.255.0 10.0.23.3

ipv6 route vrf General-Users 2001:db8:acad:108::/64 2001:db8:acad:12::1

ipv6 route vrf General-Users 2001:db8:acad:208::/64 2001:db8:acad:23::3

end

# Router R3

vrf definition General-Users

address-family ipv4

address-family ipv6

exit

vrf definition Special-Users

address-family ipv4

address-family ipv6

exit

interface g0/0/0.1

encapsulation dot1q 13

vrf forwarding Special-Users

ip address 10.0.23.3 255.255.255.0

ipv6 address fe80::3:1 link-local

ipv6 address 2001:db8:acad:23::3/64

no shutdown

exit

interface g0/0/0.2

encapsulation dot1q 8

vrf forwarding General-Users

ip address 10.0.23.3 255.255.255.0

ipv6 address fe80::3:2 link-local

ipv6 address 2001:db8:acad:23::3/64

no shutdown

exit

interface g0/0/0

no ip address

no shutdown

exit

interface g0/0/1.1

encapsulation dot1q 13

vrf forwarding Special-Users

ip address 10.0.213.1 255.255.255.0

ipv6 address fe80::3:3 link-local

ipv6 address 2001:db8:acad:213::1/64

no shutdown

exit

interface g0/0/1.2

encapsulation dot1q 8

vrf forward General-Users

ip address 10.0.208.1 255.255.255.0

ipv6 address fe80::3:4 link-local

ipv6 address 2001:db8:acad:208::1/64

no shutdown

exit

interface g0/0/1

no ip address

no shutdown

exit

ip route vrf Special-Users 0.0.0.0 0.0.0.0 10.0.23.2

ip route vrf General-Users 0.0.0.0 0.0.0.0 10.0.23.2

ipv6 route vrf Special-Users ::/0 2001:db8:acad:23::2

ipv6 route vrf General-Users ::/0 2001:db8:acad:23::2

# Part 3 Switching (student configures)

# Switch D1

interface range g1/0/1-24

shutdown

exit

interface g1/0/11

switchport mode trunk

no shutdown

exit

!

interface g1/0/23

switchport mode access

switchport access vlan 13

spanning-tree portfast

no shutdown

exit

interface range g1/0/5-6

switchport mode trunk

channel-group 1 mode desirable

no shutdown

exit

# Switch D2

interface range g1/0/1-24

shutdown

exit

interface g1/0/11

switchport mode trunk

no shutdown

exit

!

interface g1/0/23

switchport mode access

switchport access vlan 13

spanning-tree portfast

no shutdown

exit

interface g1/0/24

switchport mode access

switchport access vlan 8

spanning-tree portfast

no shutdown

exit

# Switch A1

interface range f0/1-24, g0/1-2

shutdown

exit

interface f0/23

switchport mode access

switchport access vlan 8

spanning-tree portfast

no shutdown

exit

interface range f0/1-2

switchport mode trunk

channel-group 1 mode desirable

no shutdown

exit

# Part 4: Security (Student configures)

-------------------------------------

All devices:

enable algorithm-type scrypt secret cisco12345cisco

username admin privilege 15 algorithm-type scrypt secret cisco12345cisco

aaa new-model

aaa authentication login default local

end

# Device Configurations (Final)

# Router R1

R1# **show run**

Building configuration...

Current configuration : 2434 bytes

!

version 16.9

service timestamps debug datetime msec

service timestamps log datetime msec

platform qfp utilization monitor load 80

no platform punt-keepalive disable-kernel-core

!

hostname R1

!

boot-start-marker

boot-end-marker

!

!

vrf definition General-Users

!

address-family ipv4

exit-address-family

!

address-family ipv6

exit-address-family

!

vrf definition Special-Users

!

address-family ipv4

exit-address-family

!

address-family ipv6

exit-address-family

!

enable secret 9 $9$zoLy2xVn9zcnb.$CFCHOBcQkjBm2C8a7VzDkhM2DCYnF9/aSc4B/FRXO2k

!

aaa new-model

!

aaa authentication login default local

!

aaa session-id common

!

no ip domain lookup

!

login on-success log

!

subscriber templating

!

ipv6 unicast-routing

multilink bundle-name authenticated

!

spanning-tree extend system-id

!

username admin privilege 15 secret 9 $9$5N85J1uzgRjVpE$z4mPVfXwPae5qgqpwIC6UgVMGb8Ryf1h9oNg79qhLDc

!

redundancy

mode none

!

interface GigabitEthernet0/0/0

no ip address

negotiation auto

!

interface GigabitEthernet0/0/0.1

encapsulation dot1Q 13

vrf forwarding Special-Users

ip address 10.0.12.1 255.255.255.0

ipv6 address FE80::1:1 link-local

ipv6 address 2001:DB8:ACAD:12::1/64

!

interface GigabitEthernet0/0/0.2

encapsulation dot1Q 8

vrf forwarding General-Users

ip address 10.0.12.1 255.255.255.0

ipv6 address FE80::1:2 link-local

ipv6 address 2001:DB8:ACAD:12::1/64

!

interface GigabitEthernet0/0/1

no ip address

negotiation auto

!

interface GigabitEthernet0/0/1.1

encapsulation dot1Q 13

vrf forwarding Special-Users

ip address 10.0.113.1 255.255.255.0

ipv6 address FE80::1:3 link-local

ipv6 address 2001:DB8:ACAD:113::1/64

!

interface GigabitEthernet0/0/1.2

encapsulation dot1Q 8

vrf forwarding General-Users

ip address 10.0.108.1 255.255.255.0

ipv6 address FE80::1:4 link-local

ipv6 address 2001:DB8:ACAD:108::1/64

!

interface Serial0/1/0

no ip address

!

interface Serial0/1/1

no ip address

!

ip forward-protocol nd

no ip http server

ip http secure-server

ip route vrf General-Users 0.0.0.0 0.0.0.0 10.0.12.2

ip route vrf Special-Users 0.0.0.0 0.0.0.0 10.0.12.2

!

ipv6 route vrf General-Users ::/0 2001:DB8:ACAD:12::2

ipv6 route vrf Special-Users ::/0 2001:DB8:ACAD:12::2

!

control-plane

!

banner motd ^C R1, ENCOR Skills Assessment, Scenario 2 ^C

!

line con 0

exec-timeout 0 0

logging synchronous

transport input none

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

!

end

# Router R2

R2# **show run**

Building configuration...

Current configuration : 2674 bytes

!

version 16.9

service timestamps debug datetime msec

service timestamps log datetime msec

platform qfp utilization monitor load 80

no platform punt-keepalive disable-kernel-core

!

hostname R2

!

boot-start-marker

boot-end-marker

!

!

vrf definition General-Users

!

address-family ipv4

exit-address-family

!

address-family ipv6

exit-address-family

!

enable secret 9 $9$zoLy2xVn9zcnb.$CFCHOBcQkjBm2C8a7VzDkhM2DCYnF9/aSc4B/FRXO2k

!

vrf definition Special-Users

!

address-family ipv4

exit-address-family

!

address-family ipv6

exit-address-family

!

aaa new-model

!

aaa authentication login default local

!

aaa session-id common

!

no ip domain lookup

!

login on-success log

!

subscriber templating

!

ipv6 unicast-routing

multilink bundle-name authenticated

!

spanning-tree extend system-id

!

username admin privilege 15 secret 9 $9$5N85J1uzgRjVpE$z4mPVfXwPae5qgqpwIC6UgVMGb8Ryf1h9oNg79qhLDc

!

redundancy

mode none

!

interface GigabitEthernet0/0/0

no ip address

negotiation auto

!

interface GigabitEthernet0/0/0.1

encapsulation dot1Q 13

vrf forwarding Special-Users

ip address 10.0.12.2 255.255.255.0

ipv6 address FE80::2:1 link-local

ipv6 address 2001:DB8:ACAD:12::2/64

!

interface GigabitEthernet0/0/0.2

encapsulation dot1Q 8

vrf forwarding General-Users

ip address 10.0.12.2 255.255.255.0

ipv6 address FE80::2:2 link-local

ipv6 address 2001:DB8:ACAD:12::2/64

!

interface GigabitEthernet0/0/1

no ip address

negotiation auto

!

interface GigabitEthernet0/0/1.1

encapsulation dot1Q 13

vrf forwarding Special-Users

ip address 10.0.23.2 255.255.255.0

ipv6 address FE80::2:3 link-local

ipv6 address 2001:DB8:ACAD:23::2/64

!

interface GigabitEthernet0/0/1.2

encapsulation dot1Q 8

vrf forwarding General-Users

ip address 10.0.23.2 255.255.255.0

ipv6 address FE80::2:4 link-local

ipv6 address 2001:DB8:ACAD:23::2/64

!

ip forward-protocol nd

no ip http server

ip http secure-server

ip route vrf General-Users 10.0.108.0 255.255.255.0 10.0.12.1

ip route vrf General-Users 10.0.208.0 255.255.255.0 10.0.23.3

ip route vrf Special-Users 10.0.113.0 255.255.255.0 10.0.12.1

ip route vrf Special-Users 10.0.213.0 255.255.255.0 10.0.23.3

!

ipv6 route vrf General-Users 2001:DB8:ACAD:108::/64 2001:DB8:ACAD:12::1

ipv6 route vrf Special-Users 2001:DB8:ACAD:113::/64 2001:DB8:ACAD:12::1

ipv6 route vrf General-Users 2001:DB8:ACAD:208::/64 2001:DB8:ACAD:23::3

ipv6 route vrf Special-Users 2001:DB8:ACAD:213::/64 2001:DB8:ACAD:23::3

!

control-plane

!

banner motd ^C R2, ENCOR Skills Assessment, Scenario 2 ^C

!

line con 0

exec-timeout 0 0

logging synchronous

transport input none

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

!

end

# Router R3

R3# **show run**

Building configuration...

Current configuration : 2434 bytes

!

version 16.9

service timestamps debug datetime msec

service timestamps log datetime msec

platform qfp utilization monitor load 80

no platform punt-keepalive disable-kernel-core

!

hostname R3

!

boot-start-marker

boot-end-marker

!

vrf definition General-Users

!

address-family ipv4

exit-address-family

!

address-family ipv6

exit-address-family

!

vrf definition Special-Users

!

address-family ipv4

exit-address-family

!

address-family ipv6

exit-address-family

!

enable secret 9 $9$PwSQjbwwojphpx$kxgrCz2K13dVjqVMGVfM1OkVGxXrjPNlKnV1o3abOTM

!

aaa new-model

!

aaa authentication login default local

!

aaa session-id common

!

no ip domain lookup

!

login on-success log

!

subscriber templating

!

ipv6 unicast-routing

multilink bundle-name authenticated

!

spanning-tree extend system-id

!

username admin privilege 15 secret 9 $9$ILYL84y3fxGxkx$WJfkbltPJt6.SeJjc6/VqwkVwTimtfdZX6qMMZOh0TI

!

redundancy

mode none

!

interface GigabitEthernet0/0/0

no ip address

negotiation auto

!

interface GigabitEthernet0/0/0.1

encapsulation dot1Q 13

vrf forwarding Special-Users

ip address 10.0.23.3 255.255.255.0

ipv6 address FE80::3:1 link-local

ipv6 address 2001:DB8:ACAD:23::3/64

!

interface GigabitEthernet0/0/0.2

encapsulation dot1Q 8

vrf forwarding General-Users

ip address 10.0.23.3 255.255.255.0

ipv6 address FE80::3:2 link-local

ipv6 address 2001:DB8:ACAD:23::3/64

!

interface GigabitEthernet0/0/1

no ip address

negotiation auto

!

interface GigabitEthernet0/0/1.1

encapsulation dot1Q 13

vrf forwarding Special-Users

ip address 10.0.213.1 255.255.255.0

ipv6 address FE80::3:3 link-local

ipv6 address 2001:DB8:ACAD:213::1/64

!

interface GigabitEthernet0/0/1.2

encapsulation dot1Q 8

vrf forwarding General-Users

ip address 10.0.208.1 255.255.255.0

ipv6 address FE80::3:4 link-local

ipv6 address 2001:DB8:ACAD:208::1/64

!

interface Serial0/1/0

no ip address

!

interface Serial0/1/1

no ip address

!

ip forward-protocol nd

no ip http server

ip http secure-server

ip route vrf General-Users 0.0.0.0 0.0.0.0 10.0.23.2

ip route vrf Special-Users 0.0.0.0 0.0.0.0 10.0.23.2

!

ipv6 route vrf General-Users ::/0 2001:DB8:ACAD:23::2

ipv6 route vrf Special-Users ::/0 2001:DB8:ACAD:23::2

!

control-plane

!

banner motd ^C R3, ENCOR Skills Assessment, Scenario 2 ^C

!

line con 0

exec-timeout 0 0

logging synchronous

transport input none

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

!

end

# Switch D1

D1# **show run**

Building configuration...

Current configuration : 6728 bytes

!

version 16.9

no service pad

service timestamps debug datetime msec

service timestamps log datetime msec

! Call-home is enabled by Smart-Licensing.

service call-home

no platform punt-keepalive disable-kernel-core

!

hostname D1

!

vrf definition Mgmt-vrf

!

address-family ipv4

exit-address-family

!

address-family ipv6

exit-address-family

!

enable secret 9 $9$KO1AyAeTmlkCWU$BjMAxCL19u6FHKKf/81lRNmFhlBHC.rR0Bbw7.i9iNA

!

aaa new-model

!

aaa authentication login default local

!

aaa session-id common

switch 1 provision ws-c3650-24ps

!

ip routing

!

no ip domain lookup

!

login on-success log

ipv6 unicast-routing

!

license boot level ipservicesk9

!

diagnostic bootup level minimal

!

spanning-tree mode rapid-pvst

spanning-tree extend system-id

!

username admin privilege 15 secret 9 $9$x8R/b5GOdIKyqU$ewYxQctKHyXyOSHvPXM6.WvzvhfrIkCoxPygXDmyTxQ

!

redundancy

mode sso

!

transceiver type all

monitoring

!

class-map match-any system-cpp-police-topology-control

description Topology control

class-map match-any system-cpp-police-sw-forward

description Sw forwarding, L2 LVX data, LOGGING

class-map match-any system-cpp-default

description Inter FED, EWLC control, EWLC data

class-map match-any system-cpp-police-sys-data

description Learning cache ovfl, High Rate App, Exception, EGR Exception, NFLSAMPLED DATA, RPF Failed

class-map match-any system-cpp-police-punt-webauth

description Punt Webauth

class-map match-any system-cpp-police-l2lvx-control

description L2 LVX control packets

class-map match-any system-cpp-police-forus

description Forus Address resolution and Forus traffic

class-map match-any system-cpp-police-multicast-end-station

description MCAST END STATION

class-map match-any system-cpp-police-multicast

description Transit Traffic and MCAST Data

class-map match-any system-cpp-police-l2-control

description L2 control

class-map match-any system-cpp-police-dot1x-auth

description DOT1X Auth

class-map match-any system-cpp-police-data

description ICMP redirect, ICMP\_GEN and BROADCAST

class-map match-any system-cpp-police-stackwise-virt-control

description Stackwise Virtual

class-map match-any non-client-nrt-class

class-map match-any system-cpp-police-routing-control

description Routing control and Low Latency

class-map match-any system-cpp-police-protocol-snooping

description Protocol snooping

class-map match-any system-cpp-police-dhcp-snooping

description DHCP snooping

class-map match-any system-cpp-police-system-critical

description System Critical and Gold Pkt

!

policy-map system-cpp-policy

!

interface Port-channel1

switchport mode trunk

!

interface GigabitEthernet0/0

vrf forwarding Mgmt-vrf

no ip address

negotiation auto

!

interface GigabitEthernet1/0/1

shutdown

!

interface GigabitEthernet1/0/2

shutdown

!

interface GigabitEthernet1/0/3

shutdown

!

interface GigabitEthernet1/0/4

shutdown

!

interface GigabitEthernet1/0/5

switchport mode trunk

channel-group 1 mode desirable

!

interface GigabitEthernet1/0/6

switchport mode trunk

channel-group 1 mode desirable

!

interface GigabitEthernet1/0/7

shutdown

!

interface GigabitEthernet1/0/8

shutdown

!

interface GigabitEthernet1/0/9

shutdown

!

interface GigabitEthernet1/0/10

shutdown

!

interface GigabitEthernet1/0/11

switchport mode trunk

!

interface GigabitEthernet1/0/12

shutdown

!

interface GigabitEthernet1/0/13

shutdown

!

interface GigabitEthernet1/0/14

shutdown

!

interface GigabitEthernet1/0/15

shutdown

!

interface GigabitEthernet1/0/16

shutdown

!

interface GigabitEthernet1/0/17

shutdown

!

interface GigabitEthernet1/0/18

shutdown

!

interface GigabitEthernet1/0/19

shutdown

!

interface GigabitEthernet1/0/20

shutdown

!

interface GigabitEthernet1/0/21

shutdown

!

interface GigabitEthernet1/0/22

shutdown

!

interface GigabitEthernet1/0/23

switchport access vlan 13

switchport mode access

spanning-tree portfast

!

interface GigabitEthernet1/0/24

shutdown

!

interface GigabitEthernet1/1/1

!

interface GigabitEthernet1/1/2

!

interface GigabitEthernet1/1/3

!

interface GigabitEthernet1/1/4

!

interface Vlan1

no ip address

!

ip forward-protocol nd

ip http server

ip http secure-server

!

control-plane

service-policy input system-cpp-policy

!

banner motd ^C D1, ENCOR Skills Assessment, Scenario 2 ^C

!

line con 0

exec-timeout 0 0

logging synchronous

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

line vty 5 15

login

!

end

# Switch D2

D2# **show run**

Building configuration...

Current configuration : 6653 bytes

!

version 16.9

no service pad

service timestamps debug datetime msec

service timestamps log datetime msec

! Call-home is enabled by Smart-Licensing.

service call-home

no platform punt-keepalive disable-kernel-core

!

hostname D2

!

!

vrf definition Mgmt-vrf

!

address-family ipv4

exit-address-family

!

address-family ipv6

exit-address-family

!

enable secret 9 $9$wOqJe6W8Yasi9k$7Mq8sTne4AGIivudnv6v4G.e30OcRAuXoSGcAa0DohY

!

aaa new-model

!

aaa authentication login default local

!

aaa session-id common

switch 1 provision ws-c3650-24ps

!

ip routing

!

no ip domain lookup

!

login on-success log

ipv6 unicast-routing

!

license boot level ipservicesk9!

!

diagnostic bootup level minimal

!

spanning-tree mode rapid-pvst

spanning-tree extend system-id

!

username admin privilege 15 secret 9 $9$1q0osHH4lstBHU$1DhwuWo4f1j.rLppTRRsOB86WpZaJIHSeukQ1a4uPA6

!

redundancy

mode sso

!

transceiver type all

monitoring

!

class-map match-any system-cpp-police-topology-control

description Topology control

class-map match-any system-cpp-police-sw-forward

description Sw forwarding, L2 LVX data, LOGGING

class-map match-any system-cpp-default

description Inter FED, EWLC control, EWLC data

class-map match-any system-cpp-police-sys-data

description Learning cache ovfl, High Rate App, Exception, EGR Exception, NFLSAMPLED DATA, RPF Failed

class-map match-any system-cpp-police-punt-webauth

description Punt Webauth

class-map match-any system-cpp-police-l2lvx-control

description L2 LVX control packets

class-map match-any system-cpp-police-forus

description Forus Address resolution and Forus traffic

class-map match-any system-cpp-police-multicast-end-station

description MCAST END STATION

class-map match-any system-cpp-police-multicast

description Transit Traffic and MCAST Data

class-map match-any system-cpp-police-l2-control

description L2 control

class-map match-any system-cpp-police-dot1x-auth

description DOT1X Auth

class-map match-any system-cpp-police-data

description ICMP redirect, ICMP\_GEN and BROADCAST

class-map match-any system-cpp-police-stackwise-virt-control

description Stackwise Virtual

class-map match-any non-client-nrt-class

class-map match-any system-cpp-police-routing-control

description Routing control and Low Latency

class-map match-any system-cpp-police-protocol-snooping

description Protocol snooping

class-map match-any system-cpp-police-dhcp-snooping

description DHCP snooping

class-map match-any system-cpp-police-system-critical

description System Critical and Gold Pkt

!

policy-map system-cpp-policy

!

interface GigabitEthernet0/0

vrf forwarding Mgmt-vrf

no ip address

negotiation auto

!

interface GigabitEthernet1/0/1

shutdown

!

interface GigabitEthernet1/0/2

shutdown

!

interface GigabitEthernet1/0/3

shutdown

!

interface GigabitEthernet1/0/4

shutdown

!

interface GigabitEthernet1/0/5

shutdown

!

interface GigabitEthernet1/0/6

shutdown

!

interface GigabitEthernet1/0/7

shutdown

!

interface GigabitEthernet1/0/8

shutdown

!

interface GigabitEthernet1/0/9

shutdown

!

interface GigabitEthernet1/0/10

shutdown

!

interface GigabitEthernet1/0/11

switchport mode trunk

!

interface GigabitEthernet1/0/12

shutdown

!

interface GigabitEthernet1/0/13

shutdown

!

interface GigabitEthernet1/0/14

shutdown

!

interface GigabitEthernet1/0/15

shutdown

!

interface GigabitEthernet1/0/16

shutdown

!

interface GigabitEthernet1/0/17

shutdown

!

interface GigabitEthernet1/0/18

shutdown

!

interface GigabitEthernet1/0/19

shutdown

!

interface GigabitEthernet1/0/20

shutdown

!

interface GigabitEthernet1/0/21

shutdown

!

interface GigabitEthernet1/0/22

shutdown

!

interface GigabitEthernet1/0/23

switchport access vlan 13

switchport mode access

spanning-tree portfast

!

interface GigabitEthernet1/0/24

switchport access vlan 8

switchport mode access

spanning-tree portfast

!

interface GigabitEthernet1/1/1

!

interface GigabitEthernet1/1/2

!

interface GigabitEthernet1/1/3

!

interface GigabitEthernet1/1/4

!

interface Vlan1

no ip address

!

ip forward-protocol nd

ip http server

ip http secure-server

!

control-plane

service-policy input system-cpp-policy

!

banner motd ^C D2, ENCOR Skills Assessment, Scenario 2 ^C

!

line con 0

exec-timeout 0 0

logging synchronous

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

line vty 5 15

login

!

end

# Switch A1

A1# **show run**

Building configuration...

Current configuration : 1926 bytes

!

version 15.2

no service pad

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname A1

!

boot-start-marker

boot-end-marker

!

enable secret 9 $9$a7qnivVydjhJqa$ehWSSxHj7jf6s7gjbuVc4PLGJY0dv2k.VtPqL1cn0vs

!

username admin privilege 15 secret 9 $9$itvXO10OdR7sMq$9ffgjFDlEL2j8T3040Eb21fA/2Cyjb2tHF5rZrWtZKY

aaa new-model

!

aaa authentication login default local

!

aaa session-id common

system mtu routing 1500

!

no ip domain-lookup

ipv6 unicast-routing

!

spanning-tree mode rapid-pvst

spanning-tree extend system-id

!

vlan internal allocation policy ascending

!

interface Port-channel1

switchport mode trunk

!

interface FastEthernet0/1

switchport mode trunk

channel-group 1 mode desirable

!

interface FastEthernet0/2

switchport mode trunk

channel-group 1 mode desirable

!

interface FastEthernet0/3

shutdown

!

interface FastEthernet0/4

shutdown

!

interface FastEthernet0/5

shutdown

!

interface FastEthernet0/6

shutdown

!

interface FastEthernet0/7

shutdown

!

interface FastEthernet0/8

shutdown

!

interface FastEthernet0/9

shutdown

!

interface FastEthernet0/10

shutdown

!

interface FastEthernet0/11

shutdown

!

interface FastEthernet0/12

shutdown

!

interface FastEthernet0/13

shutdown

!

interface FastEthernet0/14

shutdown

!

interface FastEthernet0/15

shutdown

!

interface FastEthernet0/16

shutdown

!

interface FastEthernet0/17

shutdown

!

interface FastEthernet0/18

shutdown

!

interface FastEthernet0/19

shutdown

!

interface FastEthernet0/20

shutdown

!

interface FastEthernet0/21

shutdown

!

interface FastEthernet0/22

shutdown

!

interface FastEthernet0/23

switchport access vlan 8

switchport mode access

spanning-tree portfast edge

!

interface FastEthernet0/24

shutdown

!

interface GigabitEthernet0/1

shutdown

!

interface GigabitEthernet0/2

shutdown

!

interface Vlan1

no ip address

!

ip http server

ip http secure-server

!

banner motd ^C A1, ENCOR Skills Assessment, Scenario 2 ^C

!

line con 0

exec-timeout 0 0

logging synchronous

line vty 0 4

login

line vty 5 15

login

!

end