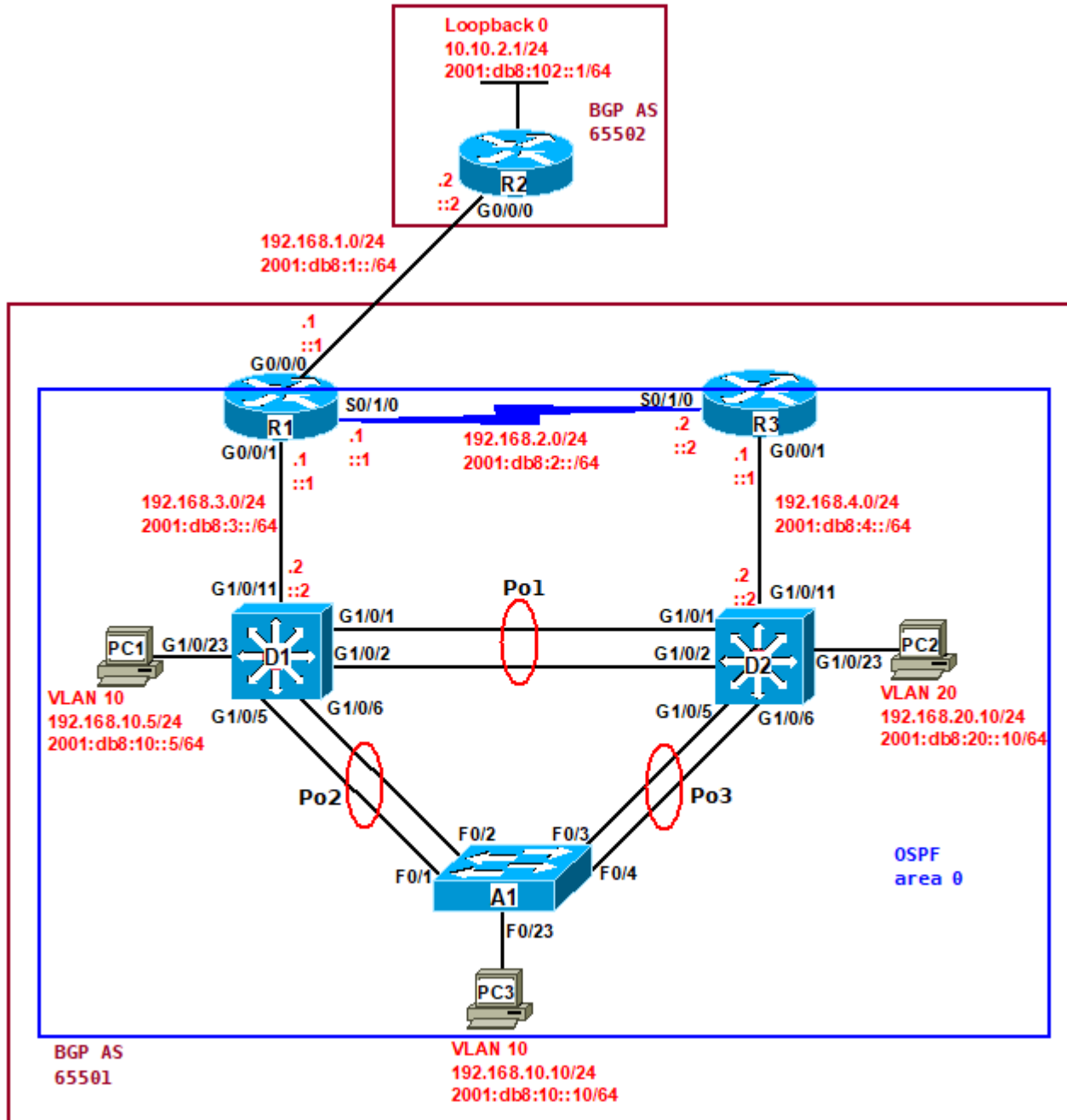


Challenge Lab 2

Instructions

Challenge labs are labs that only list tasks for you to complete to test your ability to complete the configurations from the prerequisite material and lab work you have completed thus far. Complete the configuration for each bullet point below, troubleshoot as needed.

Topology



Device	Interface	IPv4 Address	IPv6 Address
R1	G0/0/0	192.168.1.1/24	2001:db8:1::1/64
	G0/0/1	192.168.3.1/24	2001:db8:3::1/64
	S0/1/0	192.168.2.1/24	2001:db8:2::1/64
R2	G0/0/0	192.168.1.2/24	2001:db8:1::2/64

Device	Interface	IPv4 Address	IPv6 Address
	Loopback0	10.10.2.1	2001:db8:102::1/64
R3	G0/0/1	192.168.4.1/24	2001:db8:4::1/64
	S0/1/0	192.168.2.2/24	2001:db8:2::2/64
D1	G1/0/11	192.168.3.2/24	2001:db8:3::2/64
	VLAN 10	192.168.10.1/24	2001:db8:10::1/64
	VLAN 20	192.168.20.1/24	2001:db8:20::1/64
	VLAN 99	192.168.99.1/24	2001:db8:99::1/64
D2	G1/0/11	192.168.4.2/24	2001:db8:4::2/64
	VLAN 10	192.168.10.2/24	2001:db8:10::2/64
	VLAN 20	192.168.20.2/24	2001:db8:20::2/64
	VLAN 99	192.168.99.2/24	2001:db8:99::2/64
A1	VLAN 99	192.168.99.3/24	2001:db8:99::3/64
PC1	NIC	192.168.10.5/24	2001:db8:10::5/64
PC2	NIC	192.168.20.10/24	2001:db8:20::10/64
PC3	NIC	192.168.10.10/24	2001:db8:10::10/64

Initial Configurations

- Console into each router and switch, enter global configuration mode, and apply the basic settings. The startup configurations for each device are provided below.

Router R1

```

en
conf t
hostname R1
ipv6 unicast-routing
no ip domain lookup
line con 0
exec-timeout 0 0
logging synchronous
exit
interface g0/0/0
ip address 192.168.1.1 255.255.255.0
ipv6 address 2001:db8:1::1/64
no shutdown
exit
interface g0/0/1
ip address 192.168.3.1 255.255.255.0
ipv6 address 2001:db8:3::1/64
no shutdown
exit
interface s0/1/0
ip address 192.168.2.1 255.255.255.0
ipv6 address 2001:db8:2::1/64
no shutdown
exit

```

Router R2

```

en
conf t
hostname R2
ipv6 unicast-routing

```

```
no ip domain lookup
line con 0
exec-timeout 0 0
logging synchronous
exit
interface g0/0/0
ip address 192.168.1.2 255.255.255.0
ipv6 address 2001:db8:1::2/64
no shutdown
exit
interface Loopback 0
ip address 10.10.2.1 255.255.255.0
ipv6 address 2001:db8:102::1/64
no shutdown
end
```

Router R3

```
en
conf t

hostname R3
ipv6 unicast-routing
no ip domain lookup
line con 0
exec-timeout 0 0
logging synchronous
exit
interface g0/0/1
ip address 192.168.4.1 255.255.255.0
ipv6 address 2001:db8:4::1/64
no shutdown
exit
interface s0/1/0
ip address 192.168.2.2 255.255.255.0
ipv6 address 2001:db8:2::2/64
no shutdown
end
```

Switch D1

```
hostname D1
ip routing
ipv6 unicast-routing
no ip domain lookup
line con 0
exec-timeout 0 0
logging synchronous
exit
vlan 10,20,99,100
exit
interface g1/0/11
no switchport
ip address 192.168.3.2 255.255.255.0
ipv6 address 2001:db8:3::2/64
no shutdown
exit
interface vlan 10
ip address 192.168.10.1 255.255.255.0
ipv6 address 2001:db8:10::1/64
no shutdown
exit
interface vlan 20
ip address 192.168.20.1 255.255.255.0
ipv6 address 2001:db8:20::1/64
no shutdown
exit
```

```
interface vlan 99
ip address 192.168.99.1 255.255.255.0
ipv6 address 2001:db8:99::1/64
no shutdown
exit

interface range g1/0/3-4, g1/0/7-10, g1/0/12-24 g1/1/1-4
shutdown
end
```

Switch D2

```
en
conf t

hostname D2
ip routing
ipv6 unicast-routing
no ip domain lookup
line con 0
exec-timeout 0 0
logging synchronous
exit
vlan 10,20,99,100
exit
interface g1/0/11
no switchport
ip address 192.168.4.2 255.255.255.0
ipv6 address 2001:db8:4::2/64
no shutdown
exit
interface vlan 10
ip address 192.168.10.2 255.255.255.0
ipv6 address 2001:db8:10::2/64
no shutdown
exit
interface vlan 20
ip address 192.168.20.2 255.255.255.0
ipv6 address 2001:db8:20::2/64
no shutdown
exit
interface vlan 99
ip address 192.168.99.2 255.255.255.0
ipv6 address 2001:db8:99::2/64
no shutdown
exit

interface range g1/0/3-4, g1/0/7-10, g1/0/12-22, g1/0/23 g1/1/1-4
shutdown
end
```

Switch A1

```
en
conf t
hostname A1
no ip domain lookup
line con 0
exec-timeout 0 0
logging synchronous
exit
vlan 10,20,99,100
exit

interface vlan 99
ip address 192.168.99.3 255.255.255.0
```

```
ipv6 address 2001:db8:99::3/64
no shutdown
exit
interface range f0/5-22
shutdown
end
```

- Configure the PCs with IPv4 and IPv6 addresses, subnet masks/prefix lengths, and appropriate default gateways.

Switching

- Configure 802.1Q trunks on the interconnecting switch links
- Configure the native VLAN on the trunks to 100
- Configure VLAN(s) 10, 20, 99 and 100 on all Switches
- Put each PC in the correct VLAN.
- Configure the interconnecting switch links to EtherChannel using LACP
- Configure G1/0/11 on D1 and D2 to be a routed port with the correct IP address information.

Routing

- Configure Single-Area OSPFv2 for the IPv4 routing, all interfaces participate in OSPF routing except G0/0/0 on R1
- Configure classic Single-Area OSPFv3 for the IPv6 routing, all interfaces participate in OSPF routing except G0/0/0 on R1
- Configure MP-BGP in Autonomous System (AS) 65501 on R1 and in AS 65502 on R2. Advertise the networks in AS 65502 on R2 and all networks in AS 65501 on R1.

HSRP

- Configure IPV4 and IPv6 HSRPv2 on D1 and D2
- Configure a separate HSRP group for each VLAN and for IPv4/IPv6
 - For example, group #10 could be used for VLAN 10 IPv4 and group #106 could be used for VLAN 10 IPv6
- Make D1 active for VLANs 10 and 99, Standby for VLAN 20
- Make D2 active for VLAN 20, Standby for VLANs 10 and 99
- Enable preemption
- Configure IP SLA tracking on D1 to track connectivity to R1 G0/0/1. If G0/0/1 goes down D2 should become the active HSRP router for all VLANS
- Configure IP SLA tracking on D2 to track connectivity to R3 G0/0/1. If G0/0/1 on R3 goes down D1 should become the active HSRP router for all VLANS

Management

- Configure NTP on all routers and switches. Configure R1, R3, D1, D2, and A1 to synchronize with R2.
- Configure Syslog on R1 and R3 to send messages to PC1
- Configure SSHv2 on A1 for remote access
- Configure SNMPv2c on D1 and D2 with the following parameters
 - Read-Only
 - Contact info – your last name first initial

- Community String – CNIT441
- Enable traps to be sent
- Limit SNMP access to PC1

Verify and Save

- Verify you have full connectivity among all the IPv4 and IPv6 addresses in the topology and all services and management technologies are working.
- Troubleshoot as needed.
- Save the configurations to NVRAM on the Routers and Switches.