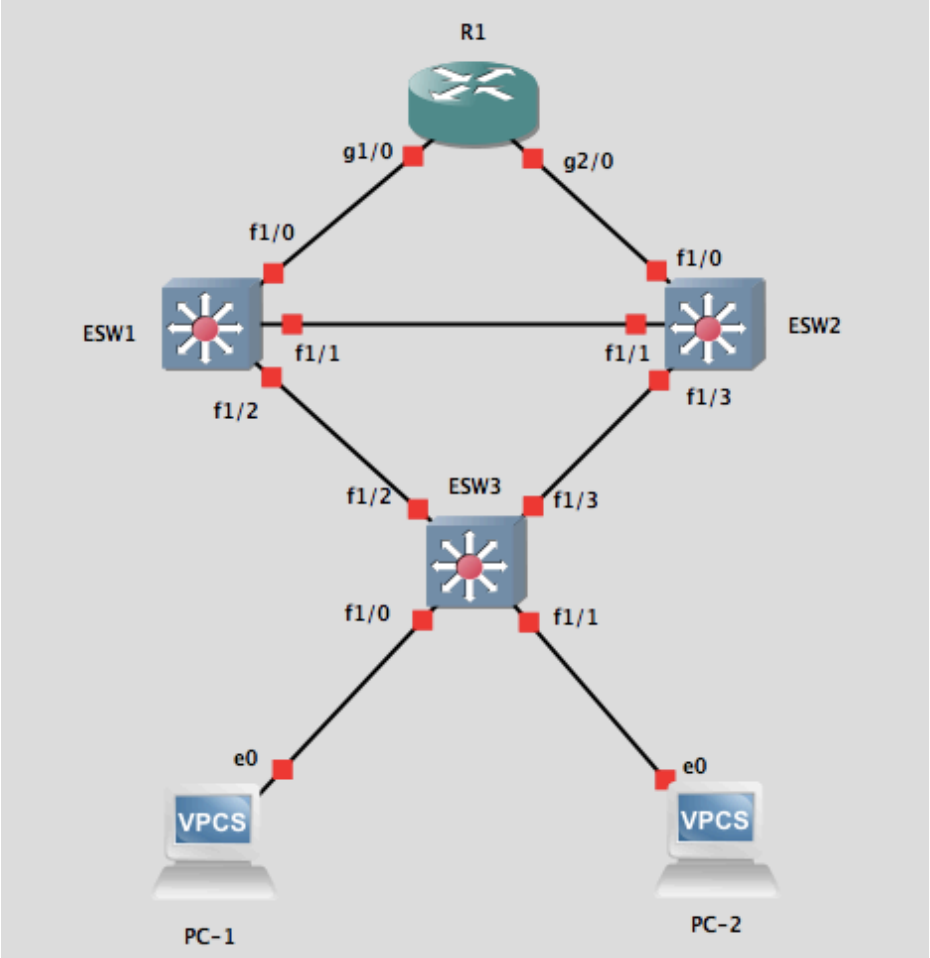
VRRP

Lab Activity

Topology


R1
g1/0
g2/0
f1/0
f1/0
ESW1
ESW2
f1/1
f1/1
f1/2
f1/3
ESW3
f1/2
f1/3
f1/0
f1/1
e0
e0
VPCS
VPCS
PC-1
PC-2

IP Plan

- R1
  - Loopback 50: 50.50.50.X/32
  - Peering: 100.100.XY.X(Y)/24
- VLAN A
  - Block: A.A.A.0/24
  - PC : A.A.A.A/24
  - Master/Backup: A.A.A.X(Y)/24
- OSPF
  - Process ID: 1
  - Area: 0
- VRRP
  - Virtual Router/GW: A.A.A.254/24

Basic Configuration

- Configure R1
  - Loopback and Interface IP
- Configure IP address for PC1 and PC2
- Configure trunk between switches
- ESW1 and ESW2
  - Configure interface VLAN IP
  - Configure STP root primary and secondary
- Configure OSPF among R1, ESW1 and ESW2
- ESW3
  - Configure access port with respective VLAN
- Ping R1 from PC1 and PC2

VRRP Configuration

- Configure VRRP
  - Interface VLAN IP
  - Virtual IP
  - Priority
- Start unlimited ping to loopback 50 of R1 from PC1 and PC2
- Shutdown F1/0 of ESW1, check the ping report
- No shut F1/0 of ESW1
- Shutdown F1/0 of ESW2, check the ping report

Verification

- show vrrp brief
- show vrrp interface vlan <number>
- show vrrp
- show ip arp

ESW1

```
int fa1/1
 switchport mode trunk
int fa1/2
 switchport mode trunk
```

ESW3

```
int fa1/0
 switchport mode access
 switchport access vlan 10
int fa1/1
 switchport mode access
 switchport access vlan 20
int range fa1/2 - 3
 switchport mode trunk
```

ESW1

```
ip routing
int fa1/0
 no shutdown
 no switchport
 ip add 100.100.11.2 255.255.255.0
 ip ospf 1 area 0
 ip ospf network point-to-point
vlan 10,20
int vlan 10
 ip add 10.10.10.1 255.255.255.0
 ip ospf 1 area 0
int vlan 20
 ip add 20.20.20.1 255.255.255.0
 ip ospf 1 area 0
```

ESW1

```
spanning-tree vlan 10 root primary
spanning-tree vlan 20 root secondary
```

ESW1

```
interface vlan10
 vrrp 10 ip 10.10.10.254
 vrrp 10 priority 110
 vrrp 10 preempt
interface vlan20
 vrrp 20 ip 20.20.20.254
 vrrp 20 priority 90
 vrrp 20 preempt
```

R1

```
int loopback 50
 ip add 50.50.50.50 255.255.255.255
 ip ospf 1 area 0
int g1/0
 ip add 100.100.11.1 255.255.255.0
 ip ospf 1 area 0
 ip ospf network point-to-point
int g2/0
 ip add 100.100.12.1 255.255.255.0
 ip ospf 1 area 0
 ip ospf network point-to-point
```

Verification: ESW1

```
ESW1#show vrrp brief
Interface   Grp Pri Time  Own Pre State   Master addr  Group addr
Vl10        10  110 3570      Y  Master  10.10.10.1   10.10.10.254
Vl20        20  90  3648      Y  Backup  20.20.20.2   20.20.20.254

ESW2#show vrrp brief
Interface   Grp Pri Time  Own Pre State   Master addr  Group addr
Vl10        10  90  3648      Y  Backup  10.10.10.1   10.10.10.254
Vl20        20  110 3570      Y  Master  20.20.20.2   20.20.20.254
```

Verification: ESW1

```
ESW1#show ip arp
Protocol  Address          Age (min)  Hardware Addr   Type   Interface
Internet  10.10.10.1               -   c201.eb83.0000  ARPA   Vlan10
Internet  10.10.10.2               7   c202.eb84.0000  ARPA   Vlan10
Internet  10.10.10.254             -   0000.5e00.010a  ARPA   Vlan10
Internet  20.20.20.1               -   c201.eb83.0000  ARPA   Vlan20
Internet  20.20.20.2               7   c202.eb84.0000  ARPA   Vlan20
Internet  100.100.11.1             7   ca05.eaf2.001c  ARPA   FastEthernet1/0
Internet  100.100.11.2             -   c201.ef43.f100  ARPA   FastEthernet1/0

ESW2#show ip arp
Protocol  Address        Age (min)  Hardware Addr   Type   Interface
Internet  10.10.10.1               8   c201.eb83.0000  ARPA   Vlan10
Internet  10.10.10.2               -   c202.eb84.0000  ARPA   Vlan10
Internet  20.20.20.1               8   c201.eb83.0000  ARPA   Vlan20
Internet  20.20.20.2               -   c202.eb84.0000  ARPA   Vlan20
Internet  20.20.20.254             -   0000.5e00.0114  ARPA   Vlan20
Internet  100.100.12.1             9   ca05.eaf2.0038  ARPA   FastEthernet1/0
Internet  100.100.12.2             -   c202.ef44.f100  ARPA   FastEthernet1/0
```

Sample Configuration: PC1

```
PC1> ip 10.10.10.10 255.255.255.0 10.10.10.254
```

Verification:

```
PC-1> arp

00:00:5e:00:01:0a  10.10.10.254 expires in 55 seconds
c2:02:eb:84:00:00  10.10.10.2 expires in 64 seconds
```

Verification: PC1 and PC2

```
PC-1> trace 50.50.50.50

trace to 50.50.50.50, 8 hops max, press Ctrl+C to
stop

 1    10.10.10.1    7.699 ms  11.402 ms  11.063 ms

 2    100.100.11.1    71.034 ms


PC-2> trace 50.50.50.50

trace to 50.50.50.50, 8 hops max, press Ctrl+C to
stop

 1    20.20.20.2    5.103 ms  11.458 ms  11.650 ms

 2    100.100.12.1    89.031 ms
```

Verification: R1

```
R1#show ip route

Gateway of last resort is not set

      10.0.0.0/24 is subnetted, 1 subnets
O        10.10.10.0 [110/2] via 100.100.12.2, 00:07:13, GigabitEthernet2/0
                    [110/2] via 100.100.11.2, 00:07:13, GigabitEthernet1/0
      20.0.0.0/24 is subnetted, 1 subnets
O        20.20.20.0 [110/2] via 100.100.12.2, 00:07:13, GigabitEthernet2/0
                    [110/2] via 100.100.11.2, 00:07:13, GigabitEthernet1/0
      50.0.0.0/32 is subnetted, 1 subnets
C        50.50.50.50 is directly connected, Loopback0
      100.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C        100.100.11.0/24 is directly connected, GigabitEthernet1/0
L        100.100.11.1/32 is directly connected, GigabitEthernet1/0
C        100.100.12.0/24 is directly connected, GigabitEthernet2/0
L        100.100.12.1/32 is directly connected, GigabitEthernet2/0
```

Verification: R1

```
R1#traceroute 10.10.10.10
Type escape sequence to abort.
Tracing the route to 10.10.10.10
VRF info: (vrf in name/id, vrf out name/id)
  1 100.100.11.2 52 msec
    100.100.12.2 48 msec
    100.100.11.2 48 msec
  2  *
    10.10.10.10 44 msec 52 msec
```

Verification: PC1

```
PC-1> ping 50.50.50.50 -c 100

84 bytes from 50.50.50.50 icmp_seq=1 ttl=254 time=35.802 ms
84 bytes from 50.50.50.50 icmp_seq=2 ttl=254 time=31.467 ms
*10.10.10.1 icmp_seq=3 ttl=255 time=42.769 ms (ICMP type:3, code:1,
Destination host unreachable)
*10.10.10.1 icmp_seq=4 ttl=255 time=1.567 ms (ICMP type:3, code:1, Destination
host unreachable)
*10.10.10.1 icmp_seq=5 ttl=255 time=6.560 ms (ICMP type:3, code:1, Destination
host unreachable)
*10.10.10.1 icmp_seq=6 ttl=255 time=7.891 ms (ICMP type:3, code:1, Destination
host unreachable)
*10.10.10.1 icmp_seq=7 ttl=255 time=6.373 ms (ICMP type:3, code:1, Destination
host unreachable)
*10.10.10.1 icmp_seq=8 ttl=255 time=6.384 ms (ICMP type:3, code:1, Destination
host unreachable)
50.50.50.50 icmp_seq=9 timeout
84 bytes from 50.50.50.50 icmp_seq=10 ttl=254 time=61.904 ms
84 bytes from 50.50.50.50 icmp_seq=11 ttl=254 time=40.476 ms
84 bytes from 50.50.50.50 icmp_seq=12 ttl=254 time=35.700 ms
84 bytes from 50.50.50.50 icmp_seq=13 ttl=254 time=38.089 ms
```

Verification: ESW1

```
int fa1/0
 shutdown
```