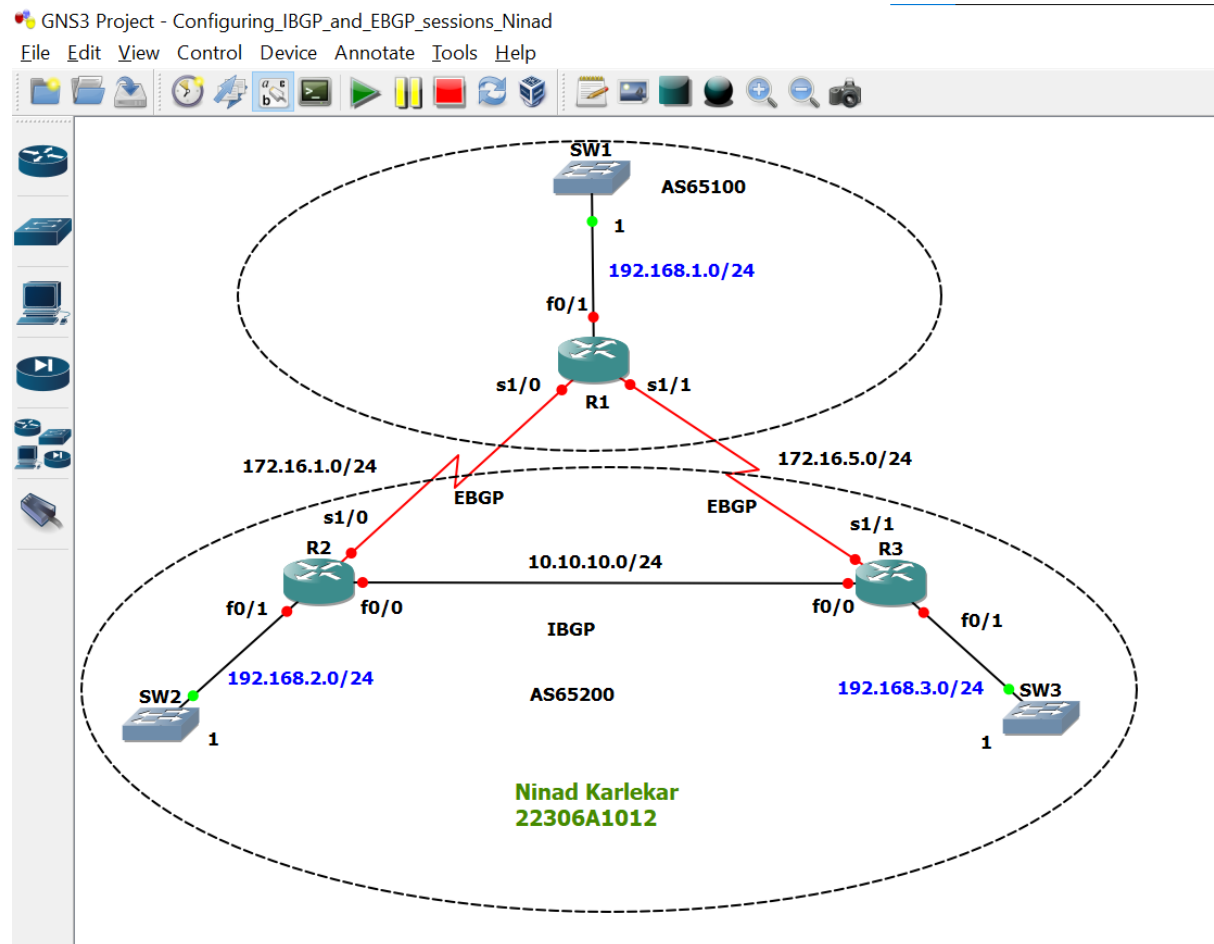


**Aim: Configure IP SLA tracking and path control topology.**



**Step 1: Configure IP addresses on the given routers**

**R1:**

```
R1 # conf t
R1(config) # int f0/1
R1(config-if) # ip add 192.168.1.1 255.255.255.0
R1(config-if) # no sh
R1(config-if) #
R1(config-if) # int s1/0
R1(config-if) # ip add 172.16.1.1 255.255.255.0
R1(config-if) # no sh
R1(config-if) #
R1(config-if) # int s1/1
R1(config-if) # ip add 172.16.5.1 255.255.255.0
R1(config-if) # no sh
```

```

R1#conf t
Enter configuration commands, one per line. End
R1(config)#int f0/1
R1(config-if)#ip add 192.168.1.1 255.255.255.0
R1(config-if)#no sh
R1(config-if)#
R1(config-if)#
*Mar 1 00:02:43.203: %LINK-3-UPDOWN: Interface Fa
tate to up
*Mar 1 00:02:44.203: %LINEPROTO-5-UPDOWN: Line p
Ethernet0/1, changed state to up
R1(config-if)#int s1/0
R1(config-if)#ip add 172.16.1.1 255.255.255.0
R1(config-if)#no sh
R1(config-if)#
R1(config-if)#
*Mar 1 00:03:07.383: %LINK-3-UPDOWN: Interface S
o up
R1(config-if)#
*Mar 1 00:03:08.387: %LINEPROTO-5-UPDOWN: Line p
all/0, changed state to up
R1(config-if)#int s1/1
R1(config-if)#ip add 172.16.5.1 255.255.255.0
R1(config-if)#no sh
R1(config-if)#

```

## R2:

```

R2 # conf t
R2(config) # int f0/0
R2(config-if) # ip add 10.10.10.2 255.255.255.0
R2(config-if) # no sh
R2(config-if) #
R2(config-if) # int f0/1
R2(config-if) # ip add 192.168.2.2 255.255.255.0
R2(config-if) # no sh
R2(config-if) #
R2(config-if) # int s1/0
R2(config-if) # ip add 172.16.1.2 255.255.255.0
R2(config-if) # no sh

```

```

R2#conf t
Enter configuration commands, one per line. End
R2(config)#int f0/0
R2(config-if)#ip add 10.10.10.2 255.255.255.0
R2(config-if)#no sh
R2(config-if)#
R2(config-if)#
R2(config-if)#
*Mar 1 00:04:25.311: %LINK-3-UPDOWN: Interface Fa
tate to up
*Mar 1 00:04:26.311: %LINEPROTO-5-UPDOWN: Line p
Ethernet0/0, changed state to up
R2(config-if)#int f0/1
R2(config-if)#ip add 192.168.2.2 255.255.255.0
R2(config-if)#no sh
R2(config-if)#
*Mar 1 00:04:39.655: %LINK-3-UPDOWN: Interface Fa
tate to up
*Mar 1 00:04:40.655: %LINEPROTO-5-UPDOWN: Line p
Ethernet0/1, changed state to up
R2(config-if)#
R2(config-if)#int s1/0
R2(config-if)#ip add 172.16.1.2 255.255.255.0
R2(config-if)#no sh
R2(config-if)#

```

### R3:

R3 # conf t

Enter configuration commands, one per line. End with CNTL/Z.

R3(config) # int f0/0

R3(config-if) # ip add 10.10.10.3 255.255.255.0

R3(config-if) # no sh

R3(config-if) #

\*Mar 1 00:05:06.839: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up

\*Mar 1 00:05:07.839: %LINEPROTO-5-UPDOWN: Line protocol on Interface

FastEthernet0/0, changed state to up

R3(config-if) #

R3(config-if) # int f0/1

R3(config-if) # ip add 192.168.3.3 255.255.255.0

R3(config-if) # no sh

R3(config-if) #

\*Mar 1 00:05:20.271: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up

\*Mar 1 00:05:21.271: %LINEPROTO-5-UPDOWN: Line protocol on Interface

FastEthernet0/1, changed state to up

R3(config-if) #

R3(config-if) # int s1/1

R3(config-if) # ip add 172.16.5.3 255.255.255.0

R3(config-if) # no sh

```
R3#
R3#conf t
Enter configuration commands, one per line. End w
R3(config)#int f0/0
R3(config-if)#ip add 10.10.10.3 255.255.255.0
R3(config-if)#no sh
R3(config-if)#
*Mar 1 00:05:06.839: %LINK-3-UPDOWN: Interface Fa
tate to up
*Mar 1 00:05:07.839: %LINEPROTO-5-UPDOWN: Line pr
Ethernet0/0, changed state to up
R3(config-if)#
R3(config-if)#int f0/1
R3(config-if)#ip add 192.168.3.3 255.255.255.0
R3(config-if)#no sh
R3(config-if)#
*Mar 1 00:05:20.271: %LINK-3-UPDOWN: Interface Fa
tate to up
*Mar 1 00:05:21.271: %LINEPROTO-5-UPDOWN: Line pr
Ethernet0/1, changed state to up
R3(config-if)#
R3(config-if)#int s1/1
R3(config-if)#ip add 172.16.5.3 255.255.255.0
R3(config-if)#no sh
R3(config-if)#
```

### On all routers:

do sh ip int br | include up

```
R1(config)#do sh ip int br | include up
FastEthernet0/1          192.168.1.1      YES manual up
Serial1/0                 172.16.1.1       YES manual up
Serial1/1                 172.16.5.1       YES manual up
```

```
R2(config-if)#do sh ip int br | include up
FastEthernet0/0      10.10.10.2      YES manual up
FastEthernet0/1      192.168.2.2      YES manual up
Serial1/0            172.16.1.2      YES manual up
```

```
R3(config-if)#do sh ip int br | include up
FastEthernet0/0      10.10.10.3      YES manual up
FastEthernet0/1      192.168.3.3      YES manual up
Serial1/1            172.16.5.3      YES manual up
```

## Step 2: Configure IRP in autonomous system 65200

### R2:

```
R2(config-if) # router ospf 1
```

```
R2(config-router) # network 10.10.10.0 0.0.0.255 area 0
```

```
R2(config-router) # network 192.168.2.0 0.0.0.255 area 1
```

```
R2(config-if)#router ospf 1
R2(config-router)#network 10.10.10.0 0.0.0.255 area 0
R2(config-router)#network 192.168.2.0 0.0.0.255 area 1
```

### R3:

```
R3(config-if) # router ospf 1
```

```
R3(config-router) # network 10.10.10.0 0.0.0.255 area 0
```

```
R3(config-router) # network 192.168.3.0 0.0.0.255 area 2
```

```
R3(config-if)#router ospf 1
R3(config-router)#network 10.10.10.0 0.0.0.255 area 0
R3(config-router)#network 192.168.3.0 0.0.0.255 area 2
```

```
do ping 192.168.2.2
```

```
FastEthernet0/0 from loading to full, loading done
R3(config-router)#do ping 192.168.2.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.2.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 24/29/32 ms
R3(config-router)#
R3(config-router)#
```

## Step 3: IBGP & EBGP configuration

### R1:

```
R1(config) # router bgp 65100
```

```
R1(config-router) # network 192.168.1.0
```

```
R1(config-router) # network 172.16.1.0 mask 255.255.255.0
```

```
R1(config-router) # network 172.16.5.0 mask 255.255.255.0
```

```
R1(config-router) # neighbor 172.16.1.2 remote-as 65200
```

```
R1(config-router) # neighbor 172.16.5.3 remote-as 65200
```

```
R1(config-router) # do sh ip route
```

```

R1(config)#
R1(config)#router bgp 65100
R1(config-router)#network 192.168.1.0
R1(config-router)#network 172.16.1.0 mask 255.255.255.0
R1(config-router)#network 172.16.5.0 mask 255.255.255.0
R1(config-router)#neighbor 172.16.1.2 remote-as 65200
R1(config-router)#neighbor 172.16.5.3 remote-as 65200
R1(config-router)#do sh ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS
-2
       ia - IS-IS inter area, * - candidate default, U - per-user st
oute
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

    172.16.0.0/24 is subnetted, 2 subnets
C       172.16.5.0 is directly connected, Serial1/1
C       172.16.1.0 is directly connected, Serial1/0
C       192.168.1.0/24 is directly connected, FastEthernet0/1
R1(config-router)#

```

## R2:

```

R2(config-router) # router bgp 65200
R2(config-router) # redistribute ospf 1
R2(config-router) # network 172.16.1.0 mask 255.255.255.0
R2(config-router) # neighbor 172.16.1.1 remote-as 65100
R2(config-router) # neighbor 10.10.10.3 remote-as 65200

```

```

R2(config-router)#
R2(config-router)#router bgp 65200
R2(config-router)#redistribute ospf 1
R2(config-router)#network 172.16.1.0 mask 255.255.255.0
R2(config-router)#neighbor 172.16.1.1 remote-as 65100
R2(config-router)#neighbor 10.10.10.3 remote-as 65200
R2(config-router)#
*Mar 1 01:32:53.123: %BGP-5-ADJCHANGE: neighbor 172.16.1.1 Up
R2(config-router)#do sh ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external ty
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS
-2
       ia - IS-IS inter area, * - candidate default, U - per-user
oute
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

    172.16.0.0/24 is subnetted, 1 subnets
C       172.16.1.0 is directly connected, Serial1/0
    10.0.0.0/24 is subnetted, 1 subnets
C       10.10.10.0 is directly connected, FastEthernet0/0
C       192.168.2.0/24 is directly connected, FastEthernet0/1
O IA 192.168.3.0/24 [110/20] via 10.10.10.3, 01:23:07, FastEthernet
R2(config-router)#

```

## R3:

```

R3(config-router) #
R3(config-router) # router bgp 65200
R3(config-router) # redistribute ospf 1
R3(config-router) # network 172.16.5.0 mask 255.255.255.0
R3(config-router) # neighbor 172.16.5.1 remote-as 65100
R3(config-router) # neighbor 10.10.10.2 remote-as 65200

```



R3(config-router) # do sh ip route

```
R3(config-router)#
R3(config-router)#router bgp 65200
R3(config-router)#redistribute ospf 1
R3(config-router)#network 172.16.5.0 mask 255.255.255.0
R3(config-router)#neighbor 172.16.5.1 remote-as 65100
R3(config-router)#neighbor 10.10.10.2 remote-as 65200
R3(config-router)#do sh ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

    172.16.0.0/24 is subnetted, 1 subnets
C       172.16.5.0 is directly connected, Serial1/1
    10.0.0.0/24 is subnetted, 1 subnets
C       10.10.10.0 is directly connected, FastEthernet0/0
O IA 192.168.2.0/24 [110/20] via 10.10.10.2, 01:23:58, FastEthernet0/0
C       192.168.3.0/24 is directly connected, FastEthernet0/1
R3(config-router)#
*Mar  1 01:33:22.495: %BGP-5-ADJCHANGE: neighbor 10.10.10.2 Up
R3(config-router)#
```

R1:

do ping 192.168.3.3

do ping 192.168.2.2

```
R1(config-router)#
R1(config-router)#do ping 192.168.3.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.3.3, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 20/28/32 ms
R1(config-router)#
R1(config-router)#
R1(config-router)#do ping 192.168.2.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.2.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms
R1(config-router)#
R1#
*Mar  1 01:53:58.735: %SYS-5-CONFIG_I: Configured from console by console
R1#
```