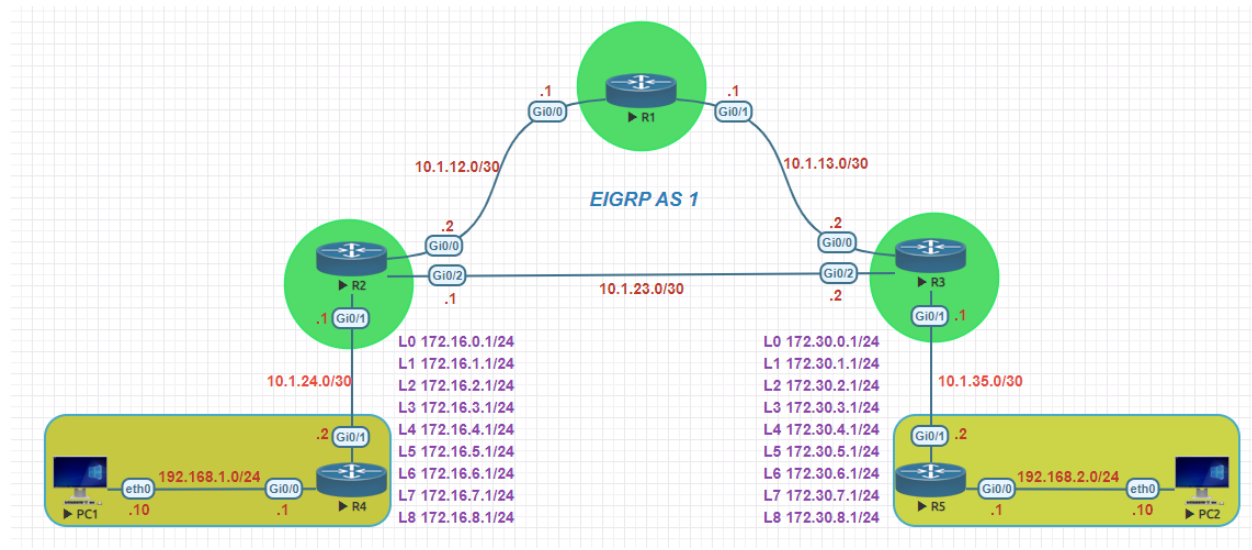


EIGRP Summarization Lab:



Router Images	vios-adventerprisek9-m.spa.159-3.m2
Client PC	VPCS
Testing	EIGRP
EIGRP Autonomous System	1

R1 Basic Configuration

```

R1(config)#hostname R1
R1(config)#no ip domain lookup
R1(config)#line con 0
R1(config-line)#exec-timeout 0 0
R1(config-line)#logging synchronous
R1(config-line)#exit
R1(config)#interface Loopback0
R1(config-if)#ip address 4.4.4.1 255.255.255.255
R1(config-if)#exit
R1(config)#interface GigabitEthernet0/0
R1(config-if)#ip address 10.1.12.1 255.255.255.252
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#interface GigabitEthernet0/1
R1(config-if)#ip address 10.1.13.1 255.255.255.252
R1(config-if)#no shutdown
R1(config-if)#exit
    
```

R2 Basic Configuration

```
R2(config)#hostname R2
R2(config)#no ip domain lookup
R2(config)#line con 0
R2(config-line)#exec-timeout 0 0
R2(config-line)#logging synchronous
R2(config-line)#exit
R2(config)#interface GigabitEthernet0/0
R2(config-if)#ip address 10.1.12.2 255.255.255.252
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#interface GigabitEthernet0/1
R2(config-if)#ip address 10.1.24.1 255.255.255.252
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#interface GigabitEthernet0/2
R2(config-if)#ip address 10.1.23.1 255.255.255.252
R2(config-if)#no shutdown
R2(config-if)#exit
```

R3 Basic Configuration

```
R3(config)#hostname R3
R3(config)#no ip domain lookup
R3(config)#line con 0
R3(config-line)#exec-timeout 0 0
R3(config-line)#logging synchronous
R3(config-line)#exit
R3(config)#interface GigabitEthernet0/0
R3(config-if)#ip address 10.1.13.2 255.255.255.252
R3(config-if)#no shutdown
R3(config-if)#exit
R3(config)#interface GigabitEthernet0/1
R3(config-if)#ip address 10.1.35.1 255.255.255.252
R3(config-if)#no shutdown
R3(config-if)#exit
R3(config)#interface GigabitEthernet0/2
R3(config-if)#ip address 10.1.23.2 255.255.255.252
R3(config-if)#no shutdown
R3(config-if)#exit
```

R4 Basic Configuration

```
R4(config)#hostname R4
R4(config)#no ip domain lookup
R4(config)#line con 0
R4(config-line)#exec-timeout 0 0
R4(config-line)#logging synchronous
R4(config-line)#exit
R4(config)#interface Loopback0
R4(config-if)#ip address 172.16.0.1 255.255.255.0
R4(config-if)#exit
R4(config)#interface Loopback1
R4(config-if)#ip address 172.16.1.1 255.255.255.0
R4(config-if)#exit
R4(config)#interface Loopback2
R4(config-if)#ip address 172.16.2.1 255.255.255.0
R4(config-if)#exit
R4(config)#interface Loopback3
R4(config-if)#ip address 172.16.3.1 255.255.255.0
R4(config-if)#exit
R4(config)#interface Loopback4
R4(config-if)#ip address 172.16.4.1 255.255.255.0
R4(config-if)#exit
R4(config)#interface Loopback5
R4(config-if)#ip address 172.16.5.1 255.255.255.0
R4(config-if)#exit
R4(config)#interface Loopback6
R4(config-if)#ip address 172.16.6.1 255.255.255.0
R4(config-if)#exit
R4(config)#interface Loopback7
R4(config-if)#ip address 172.16.7.1 255.255.255.0
R4(config-if)#exit
R4(config)#interface Loopback8
R4(config-if)#ip address 172.16.8.1 255.255.255.0
R4(config-if)#exit
R4(config)#interface GigabitEthernet0/0
R4(config-if)#ip address 192.168.1.1 255.255.255.0
R4(config-if)#no shutdown
R4(config-if)#exit
R4(config)#interface GigabitEthernet0/1
R4(config-if)#ip address 10.1.24.2 255.255.255.252
R4(config-if)#no shutdown
R4(config-if)#exit
```

R5 Basic Configuration

```
R5(config)#hostname R5
R5(config)#no ip domain lookup
R5(config)#line con 0
R5(config-line)#exec-timeout 0 0
R5(config-line)#logging synchronous
R5(config-line)#exit
R5(config)#interface Loopback0
R5(config-if)#ip address 172.30.0.1 255.255.255.0
R5(config-if)#exit
R5(config)#interface Loopback1
R5(config-if)#ip address 172.30.1.1 255.255.255.0
R5(config-if)#exit
R5(config)#interface Loopback2
R5(config-if)#ip address 172.30.2.1 255.255.255.0
R5(config-if)#exit
R5(config)#interface Loopback3
R5(config-if)#ip address 172.30.3.1 255.255.255.0
R5(config-if)#exit
R5(config)#interface Loopback4
R5(config-if)#ip address 172.30.4.1 255.255.255.0
R5(config-if)#exit
R5(config)#interface Loopback5
R5(config-if)#ip address 172.30.5.1 255.255.255.0
R5(config-if)#exit
R5(config)#interface Loopback6
R5(config-if)#ip address 172.30.6.1 255.255.255.0
R5(config-if)#exit
R5(config)#interface Loopback7
R5(config-if)#ip address 172.30.7.1 255.255.255.0
R5(config-if)#exit
R5(config)#interface Loopback8
R5(config-if)#ip address 172.30.8.1 255.255.255.0
R5(config-if)#exit
R5(config)#interface GigabitEthernet0/0
R5(config-if)#ip address 192.168.2.1 255.255.255.0
R5(config-if)#no shutdown
R5(config-if)#exit
R5(config)#interface GigabitEthernet0/1
R5(config-if)#ip address 10.1.35.2 255.255.255.252
R5(config-if)#no shutdown
R5(config-if)#exit
```

PC1 Basic Configuration

```
VPCS> set pcname PC1  
PC1> ip 192.168.1.10 /24 192.168.1.1
```

PC2 Basic Configuration

```
VPCS> set pcname PC2  
PC2> ip 192.168.2.10 /24 192.168.2.10
```

R1 EIGRP Configuration

```
R1(config)#router eigrp 1  
R1(config-router)#network 10.1.12.0 0.0.0.3  
R1(config-router)#network 10.1.13.0 0.0.0.3  
R1(config-router)#no auto-summary  
R1(config-router)#exit
```

R2 EIGRP Configuration

```
R2(config)#router eigrp 1  
R2(config-router)#network 10.1.12.0 0.0.0.3  
R2(config-router)#network 10.1.23.0 0.0.0.3  
R2(config-router)#no auto-summary  
R2(config-router)#exit
```

R2 EIGRP Static Configuration

```
R2(config)#router eigrp 1  
R2(config-router)#network 10.1.24.0 0.0.0.3  
R2(config-router)#neighbor 10.1.24.2 gigabitEthernet 0/1  
R2(config-router)#exit
```

R3 EIGRP Configuration

```
R3(config)#router eigrp 1  
R3(config-router)#network 10.1.13.0 0.0.0.3  
R3(config-router)#network 10.1.23.0 0.0.0.3  
R3(config-router)#network 10.1.35.0 0.0.0.3  
R3(config-router)#no auto-summary  
R3(config-router)#exit
```

R4 EIGRP Configuration

```
R4(config)#router eigrp 1
R4(config-router)#network 10.1.24.0 0.0.0.3
R4(config-router)#neighbor 10.1.24.1 gigabitEthernet 0/1
R4(config-router)#network 192.168.1.0 0.0.0.255
R4(config-router)#network 172.16.0.0 0.0.255.255
R4(config-router)#no auto-summary
R4(config-router)#exit
```

R5 EIGRP Named Mode Configuration

```
R5(config)#router eigrp CCNP
R5(config-router)#address-family ipv4 unicast autonomous-system 1
R5(config-router-af)#network 0.0.0.0 255.255.255.255
R5(config-router-af)#exit
```

Show Commands

```
R1#show ip eigrp neighbors
R1#show ip route eigrp | begin Gateway
R2#show ip eigrp neighbors
R3#show ip eigrp neighbors
R4#show ip eigrp neighbors
R4#show ip route eigrp | begin Gateway
R5#show ip eigrp neighbors
R5#show ip route eigrp | begin Gateway
PC1> ping 192.168.2.10
PC2> ping 192.168.1.10
```

```
R4#show ip route eigrp
```

```
Gateway of last resort is not set
```

```
    10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
D       10.1.12.0/30 [90/3072] via 10.1.24.1, 01:29:10, GigabitEthernet0/1
D       10.1.13.0/30 [90/3328] via 10.1.24.1, 01:29:01, GigabitEthernet0/1
D       10.1.23.0/30 [90/3072] via 10.1.24.1, 01:29:10, GigabitEthernet0/1
D       10.1.35.0/30 [90/3328] via 10.1.24.1, 01:29:07, GigabitEthernet0/1
D       172.30.0.0/24 is subnetted, 9 subnets
D         172.30.0.0 [90/3360] via 10.1.24.1, 01:29:03, GigabitEthernet0/1
D         172.30.1.0 [90/3360] via 10.1.24.1, 01:29:03, GigabitEthernet0/1
D         172.30.2.0 [90/3360] via 10.1.24.1, 01:29:03, GigabitEthernet0/1
D         172.30.3.0 [90/3360] via 10.1.24.1, 01:29:03, GigabitEthernet0/1
D         172.30.4.0 [90/3360] via 10.1.24.1, 01:29:03, GigabitEthernet0/1
D         172.30.5.0 [90/3360] via 10.1.24.1, 01:29:03, GigabitEthernet0/1
D         172.30.6.0 [90/3360] via 10.1.24.1, 01:29:03, GigabitEthernet0/1
D         172.30.7.0 [90/3360] via 10.1.24.1, 01:29:03, GigabitEthernet0/1
D         172.30.8.0 [90/3360] via 10.1.24.1, 01:29:03, GigabitEthernet0/1
D       192.168.2.0/24 [90/3584] via 10.1.24.1, 01:29:03, GigabitEthernet0/1
```

```
R5#show ip route eigrp
Codes: L - local, 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, H - NHRP, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from Pfr
```

Gateway of last resort is not set

```
10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
D 10.1.12.0/30 [90/20480] via 10.1.35.1, 01:31:58, GigabitEthernet0/1
D 10.1.13.0/30 [90/15360] via 10.1.35.1, 01:32:04, GigabitEthernet0/1
D 10.1.23.0/30 [90/15360] via 10.1.35.1, 01:32:04, GigabitEthernet0/1
D 10.1.24.0/30 [90/20480] via 10.1.35.1, 01:32:00, GigabitEthernet0/1
172.16.0.0/24 is subnetted, 9 subnets
D 172.16.0.0 [90/2580480] via 10.1.35.1, 01:32:00, GigabitEthernet0/1
D 172.16.1.0 [90/2580480] via 10.1.35.1, 01:32:00, GigabitEthernet0/1
D 172.16.2.0 [90/2580480] via 10.1.35.1, 01:32:00, GigabitEthernet0/1
D 172.16.3.0 [90/2580480] via 10.1.35.1, 01:32:00, GigabitEthernet0/1
D 172.16.4.0 [90/2580480] via 10.1.35.1, 01:32:00, GigabitEthernet0/1
D 172.16.5.0 [90/2580480] via 10.1.35.1, 01:32:00, GigabitEthernet0/1
D 172.16.6.0 [90/2580480] via 10.1.35.1, 01:32:00, GigabitEthernet0/1
D 172.16.7.0 [90/2580480] via 10.1.35.1, 01:32:00, GigabitEthernet0/1
D 172.16.8.0 [90/2580480] via 10.1.35.1, 01:32:00, GigabitEthernet0/1
D _192.168.1.0/24 [90/25600] via 10.1.35.1, 01:32:00, GigabitEthernet0/1
```

R4 EIGRP auto Summarization Configuration

```
R4(config)#router eigrp 1
R4(config-router)#auto-summary
R4(config-router)#exit
```

R5 EIGRP auto Summarization Configuration

```
R5(config)#router eigrp CCNP
R5(config-router)#address-family ipv4 unicast autonomous-system 1
R5(config-router-af)#topology base
R5(config-router-af-topology)#auto-summary
R5(config-router-af-topology)#exit
R5(config-router-af)#exit
R5(config-router)#exit
```

```
10.0.0.0/8 is variably subnetted, 7 subnets, 3 masks
D 10.0.0.0/8 is a summary, 00:08:11, Null0
D 10.1.12.0/30 [90/3072] via 10.1.24.1, 01:42:12, GigabitEthernet0/1
D 10.1.13.0/30 [90/3328] via 10.1.24.1, 01:42:03, GigabitEthernet0/1
D 10.1.23.0/30 [90/3072] via 10.1.24.1, 01:42:12, GigabitEthernet0/1
D 10.1.35.0/30 [90/3328] via 10.1.24.1, 01:42:09, GigabitEthernet0/1
172.16.0.0/16 is variably subnetted, 19 subnets, 3 masks
D 172.16.0.0/16 is a summary, 00:08:11, Null0 ←
172.30.0.0/16 is subnetted, 1 subnets
D 172.30.0.0 [90/3360] via 10.1.24.1, 00:05:16, GigabitEthernet0/1
D 192.168.2.0/24 [90/3584] via 10.1.24.1, 01:42:05, GigabitEthernet0/1
R4#
```

```

R5#show ip route eigrp
Codes: L - local, 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, H - NHRP, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from Pfr

```

Gateway of last resort is not set

```

10.0.0.0/8 is variably subnetted, 7 subnets, 3 masks
D 10.0.0.0/8 is a summary, 00:06:27, Null0
D 10.1.12.0/30 [90/20480] via 10.1.35.1, 01:43:12, GigabitEthernet0/1
D 10.1.13.0/30 [90/15360] via 10.1.35.1, 01:43:18, GigabitEthernet0/1
D 10.1.23.0/30 [90/15360] via 10.1.35.1, 01:43:18, GigabitEthernet0/1
D 10.1.24.0/30 [90/20480] via 10.1.35.1, 01:43:14, GigabitEthernet0/1
172.16.0.0/16 is subnetted, 1 subnets
D 172.16.0.0 [90/2580480] via 10.1.35.1, 00:09:21, GigabitEthernet0/1
172.30.0.0/16 is variably subnetted, 19 subnets, 3 masks
D 172.30.0.0/16 is a summary, 00:06:27, Null0
D 192.168.1.0/24 [90/25600] via 10.1.35.1, 01:43:14, GigabitEthernet0/1
R5#

```

Disable R4 EIGRP auto Summarization

```

R4(config)#router eigrp 1
R4(config-router)#no auto-summary
R4(config-router)#exit

```

Disable R5 EIGRP auto Summarization

```

R5(config)#router eigrp CCNP
R5(config-router)#address-family ipv4 unicast autonomous-system 1
R5(config-router-af)#topology base
R5(config-router-af-topology)#no auto-summary
R5(config-router-af-topology)#exit
R5(config-router-af)#exit
R5(config-router)#exit

```

R4 EIGRP Manual Summarization Configuration

```

R4(config)#interface g0/1
R4(config-if)#ip summary-address eigrp 1 172.16.0.0 255.255.240.0
R4(config-if)#exit

```

R5 EIGRP Manual Summarization Configuration

```

R5(config)#router eigrp test
R5(config-router)#address-family ipv4 unicast autonomous-system 1
R5(config-router-af)#af-interface g0/1
R5(config-router-af-interface)#summary-address 172.30.0.0 255.255.240.0
R5(config-router-af-interface)#exit

```

```
R4#show ip route eigrp
Codes: L - local, 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, H - NHRP, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from PFR
```

Gateway of last resort is not set

```
10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
D 10.1.12.0/30 [90/3072] via 10.1.24.1, 01:49:59, GigabitEthernet0/1
D 10.1.13.0/30 [90/3328] via 10.1.24.1, 01:49:50, GigabitEthernet0/1
D 10.1.23.0/30 [90/3072] via 10.1.24.1, 01:49:59, GigabitEthernet0/1
D 10.1.35.0/30 [90/3328] via 10.1.24.1, 01:49:56, GigabitEthernet0/1
172.16.0.0/16 is variably subnetted, 19 subnets, 3 masks
D 172.16.0.0/20 is a summary, 00:00:48, Null0
172.30.0.0/20 is subnetted, 1 subnets
D 172.30.0.0 [90/3360] via 10.1.24.1, 00:00:33, GigabitEthernet0/1
D 192.168.2.0/24 [90/3584] via 10.1.24.1, 01:49:52, GigabitEthernet0/1
R4#
```

```
R5#show ip route eigrp
Codes: L - local, 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, H - NHRP, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from PFR
```

Gateway of last resort is not set

```
10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
D 10.1.12.0/30 [90/20480] via 10.1.35.1, 01:51:03, GigabitEthernet0/1
D 10.1.13.0/30 [90/15360] via 10.1.35.1, 01:51:09, GigabitEthernet0/1
D 10.1.23.0/30 [90/15360] via 10.1.35.1, 01:51:09, GigabitEthernet0/1
D 10.1.24.0/30 [90/20480] via 10.1.35.1, 01:51:05, GigabitEthernet0/1
172.16.0.0/20 is subnetted, 1 subnets
D 172.16.0.0 [90/2580480] via 10.1.35.1, 00:02:02, GigabitEthernet0/1
172.30.0.0/16 is variably subnetted, 19 subnets, 3 masks
D 172.30.0.0/20 is a summary, 00:01:47, Null0
D 192.168.1.0/24 [90/25600] via 10.1.35.1, 01:51:05, GigabitEthernet0/1
```

Show Commands

```
R1#show ip route eigrp | begin Gateway
R1#show ip eigrp topology
R1#ping 172.16.7.1
R1#ping 172.30.7.1
R4#show ip route eigrp | begin Gateway
R4#show ip protocols | b eigrp
R5#show ip route eigrp | begin Gateway
R5#show ip protocols | b eigrp
```