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OSPFv2

« CCIE SPv4 Topology Diagrams & Initial Configs (/workbook/view/service-provider-v4/task/ccie-spv4-topology-diagrams-initial-configs-MjgyMw%3D%3D) | OSPFv2 Network Types (/workbook/view/service-provider-v4/task/ospfv2-network-types-MjgyOA%3D%3D) »

Last updated: April 23, 2016

Note:

Initial Configuration & Diagrams: Load the initial configuration files for the section named **Base IPv4**, which can be found in CCIE SPv4 Topology Diagrams & Initial Configurations (http://labs.ine.com/workbook/view/service-provider-v4/task/ccie-spv4-topology-diagrams-initial-configs). Refer to the **Base IPv4 Diagram** in order to complete this task.

Task

- Using the Base IPv4 Diagram, configure OSPFv2 Area 0 on all interfaces of all devices.
- Statically set the OSPF Router IDs of all devices to their Loopback0 interface address.
- Once complete, all devices should have IPv4 reachability to each other.

Configuration **Click to *collapse***

```
R1:
router ospf 1
 router-id 1.1.1.1
 network 0.0.0.0 255.255.255.255 area 0

R2:
router ospf 1
 router-id 2.2.2.2
 network 0.0.0.0 255.255.255.255 area 0

R3:
router ospf 1
 router-id 3.3.3.3
 network 0.0.0.0 255.255.255.255 area 0

R4:
router ospf 1
 router-id 4.4.4.4
 network 0.0.0.0 255.255.255.255 area 0

R5:
router ospf 1
 router-id 5.5.5.5
 network 0.0.0.0 255.255.255.255 area 0

R6:
router ospf 1
 router-id 6.6.6.6
 network 0.0.0.0 255.255.255.255 area 0

XR1:
router ospf 1
 router-id 19.19.19.19
 area 0
  interface Loopback0
  !
  interface GigabitEthernet0/0/0/0.519
  !
  interface GigabitEthernet0/0/0/0.619
  !
  interface GigabitEthernet0/0/0/0.1920
  !
 !
!

XR2:
router ospf 1
 router-id 20.20.20.20
 area 0
  interface Loopback0
  !
  interface GigabitEthernet0/0/0/0.1920
  !
```

```
 !
!
```

Verification

All devices should be adjacent with their directly connected neighbors.

```
R6#show ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address         Interface
19.19.19.19       1   FULL/BDR        00:00:34    20.6.19.19      GigabitEthernet1.619
5.5.5.5           1   FULL/BDR        00:00:36    20.5.6.5        GigabitEthernet1.56
4.4.4.4           1   FULL/BDR        00:00:32    20.4.6.4        GigabitEthernet1.46
3.3.3.3           1   FULL/BDR        00:00:32    20.3.6.3        GigabitEthernet1.36


RP/0/0/CPU0:XR1#show ospf neighbor
Sun Apr 19 17:04:42.146 UTC

* Indicates MADJ interface

Neighbors for OSPF 1

Neighbor ID     Pri   State           Dead Time   Address         Interface
5.5.5.5         1     FULL/DR         00:00:34    20.5.19.5       GigabitEthernet0/0/0/0.519
    Neighbor is up for 00:02:48
6.6.6.6         1     FULL/DR         00:00:34    20.6.19.6       GigabitEthernet0/0/0/0.619
    Neighbor is up for 00:02:46
20.20.20.20     1     FULL/DR         00:00:38    10.19.20.20     GigabitEthernet0/0/0/0.1920
    Neighbor is up for 00:02:32

Total neighbor count: 3
```

All routers generate a Router LSA (LSA Type 1) and the DR for Ethernet links generates a Network LSA (LSA Type 2). The view of the OSPF database should be identical from all routers, both regular IOS and IOS XR.

```
R6#show ip ospf database

            OSPF Router with ID (6.6.6.6) (Process ID 1)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
1.1.1.1         1.1.1.1         630         0x80000002 0x00B542 2
2.2.2.2         2.2.2.2         527         0x80000005 0x00E76E 4
3.3.3.3         3.3.3.3         608         0x80000004 0x00041E 4
4.4.4.4         4.4.4.4         608         0x80000004 0x008238 5
5.5.5.5         5.5.5.5         233         0x80000004 0x005A78 4
6.6.6.6         6.6.6.6         230         0x80000003 0x003A2E 5
19.19.19.19     19.19.19.19     187         0x80000004 0x00426A 4
20.20.20.20     20.20.20.20     188         0x80000002 0x006C39 2

                Net Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum
10.1.2.2        2.2.2.2         629         0x80000001 0x0021F5
10.19.20.20     20.20.20.20     189         0x80000001 0x00AC5B
20.2.3.3        3.3.3.3         623         0x80000001 0x00B34A
20.2.4.4        4.4.4.4         618         0x80000001 0x00A251
20.3.4.4        4.4.4.4         618         0x80000001 0x00C826
20.3.6.6        6.6.6.6         607         0x80000001 0x00A634
20.4.5.5        5.5.5.5         613         0x80000001 0x00DD02
20.4.6.6        6.6.6.6         607         0x80000001 0x00CC09
20.5.6.6        6.6.6.6         607         0x80000001 0x00F2DD
20.5.19.5       5.5.5.5         233         0x80000001 0x00286C
20.6.19.6       6.6.6.6         230         0x80000001 0x001674


RP/0/0/CPU0:XR1#show ospf database
Sun Apr 19 17:06:25.479 UTC


            OSPF Router with ID (19.19.19.19) (Process ID 1)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
1.1.1.1         1.1.1.1         669         0x80000002 0x00b542 2
2.2.2.2         2.2.2.2         566         0x80000005 0x00e76e 4
3.3.3.3         3.3.3.3         648         0x80000004 0x00041e 4
4.4.4.4         4.4.4.4         647         0x80000004 0x008238 5
5.5.5.5         5.5.5.5         272         0x80000004 0x005a78 4
6.6.6.6         6.6.6.6         270         0x80000003 0x003a2e 5
19.19.19.19     19.19.19.19     225         0x80000004 0x00426a 4
20.20.20.20     20.20.20.20     226         0x80000002 0x006c39 2

                Net Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum
```

```
10.1.2.2        2.2.2.2         668         0x80000001 0x0021f5
10.19.20.20     20.20.20.20     226         0x80000001 0x00ac5b
20.2.3.3        3.3.3.3         662         0x80000001 0x00b34a
20.2.4.4        4.4.4.4         656         0x80000001 0x00a251
20.3.4.4        4.4.4.4         656         0x80000001 0x00c826
20.3.6.6        6.6.6.6         647         0x80000001 0x00a634
20.4.5.5        5.5.5.5         650         0x80000001 0x00dd02
20.4.6.6        6.6.6.6         647         0x80000001 0x00cc09
20.5.6.6        6.6.6.6         647         0x80000001 0x00f2dd
20.5.19.5       5.5.5.5         272         0x80000001 0x00286c
20.6.19.6       6.6.6.6         270         0x80000001 0x001674
```

All devices should have full routing information about the network.

```
R1#show ip route ospf
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

Gateway of last resort is not set

      2.0.0.0/32 is subnetted, 1 subnets
O        2.2.2.2 [110/2] via 10.1.2.2, 00:11:46, GigabitEthernet1.12
      3.0.0.0/32 is subnetted, 1 subnets
O        3.3.3.3 [110/3] via 10.1.2.2, 00:11:36, GigabitEthernet1.12
      4.0.0.0/32 is subnetted, 1 subnets
O        4.4.4.4 [110/3] via 10.1.2.2, 00:11:26, GigabitEthernet1.12
      5.0.0.0/32 is subnetted, 1 subnets
O        5.5.5.5 [110/4] via 10.1.2.2, 00:11:26, GigabitEthernet1.12
      6.0.0.0/32 is subnetted, 1 subnets
O        6.6.6.6 [110/4] via 10.1.2.2, 00:11:26, GigabitEthernet1.12
      10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks
O        10.19.20.0/24 [110/5] via 10.1.2.2, 00:04:25, GigabitEthernet1.12
      19.0.0.0/32 is subnetted, 1 subnets
O        19.19.19.19 [110/5] via 10.1.2.2, 00:05:12, GigabitEthernet1.12
      20.0.0.0/8 is variably subnetted, 10 subnets, 2 masks
O        20.2.3.0/24 [110/2] via 10.1.2.2, 00:11:36, GigabitEthernet1.12
O        20.2.4.0/24 [110/2] via 10.1.2.2, 00:11:36, GigabitEthernet1.12
O        20.3.4.0/24 [110/3] via 10.1.2.2, 00:11:36, GigabitEthernet1.12
O        20.3.6.0/24 [110/3] via 10.1.2.2, 00:11:26, GigabitEthernet1.12
O        20.4.5.0/24 [110/3] via 10.1.2.2, 00:11:26, GigabitEthernet1.12
O        20.4.6.0/24 [110/3] via 10.1.2.2, 00:11:26, GigabitEthernet1.12
O        20.5.6.0/24 [110/4] via 10.1.2.2, 00:11:26, GigabitEthernet1.12
O        20.5.19.0/24 [110/4] via 10.1.2.2, 00:11:26, GigabitEthernet1.12
O        20.6.19.0/24 [110/4] via 10.1.2.2, 00:11:26, GigabitEthernet1.12
O        20.20.20.20/32 [110/6] via 10.1.2.2, 00:04:15, GigabitEthernet1.12

RP/0/0/CPU0:XR2#show route ipv4 ospf
Sun Apr 19 17:07:44.974 UTC

O    1.1.1.1/32 [110/6] via 10.19.20.19, 00:05:04, GigabitEthernet0/0/0/0.1920
O    2.2.2.2/32 [110/5] via 10.19.20.19, 00:05:04, GigabitEthernet0/0/0/0.1920
O    3.3.3.3/32 [110/4] via 10.19.20.19, 00:05:04, GigabitEthernet0/0/0/0.1920
O    4.4.4.4/32 [110/4] via 10.19.20.19, 00:05:04, GigabitEthernet0/0/0/0.1920
O    5.5.5.5/32 [110/3] via 10.19.20.19, 00:05:04, GigabitEthernet0/0/0/0.1920
O    6.6.6.6/32 [110/3] via 10.19.20.19, 00:05:04, GigabitEthernet0/0/0/0.1920
O    10.1.2.0/24 [110/5] via 10.19.20.19, 00:05:04, GigabitEthernet0/0/0/0.1920
O    19.19.19.19/32 [110/2] via 10.19.20.19, 00:05:04, GigabitEthernet0/0/0/0.1920
O    20.2.3.0/24 [110/4] via 10.19.20.19, 00:05:04, GigabitEthernet0/0/0/0.1920
O    20.2.4.0/24 [110/4] via 10.19.20.19, 00:05:04, GigabitEthernet0/0/0/0.1920
O    20.3.4.0/24 [110/4] via 10.19.20.19, 00:05:04, GigabitEthernet0/0/0/0.1920
```

```
O    20.3.6.0/24 [110/3] via 10.19.20.19, 00:05:04, GigabitEthernet0/0/0/0.1920
O    20.4.5.0/24 [110/3] via 10.19.20.19, 00:05:04, GigabitEthernet0/0/0/0.1920
O    20.4.6.0/24 [110/3] via 10.19.20.19, 00:05:04, GigabitEthernet0/0/0/0.1920
O    20.5.6.0/24 [110/3] via 10.19.20.19, 00:05:04, GigabitEthernet0/0/0/0.1920
O    20.5.19.0/24 [110/2] via 10.19.20.19, 00:05:04, GigabitEthernet0/0/0/0.1920
O    20.6.19.0/24 [110/2] via 10.19.20.19, 00:05:04, GigabitEthernet0/0/0/0.1920
```

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