

# CCIE Service Provider Lab Workbook v4.0 (<http://labs.ine.com/workbook/toc/service-provider-v4>) » CCIE SP v4 Advanced Technology Labs - IGP

## › OSPFv3 Network Types

CONTENTS

« [OSPFv3 \(/workbook/view/service-provider-v4/task/ospfv3-MjgzMg%3D%3D\)](#) | [OSPFv3 Path Selection \(/workbook/view/service-provider-v4/task/ospfv3-path-selection-MjgzNA%3D%3D\)](#) »

Last updated: April 23, 2016

### Note:

This task assumes that you have already completed the [OSPFv3](http://labs.ine.com/workbook/view/service-provider-v4/task/ospfv3-MjgzMg%3D%3D) (<http://labs.ine.com/workbook/view/service-provider-v4/task/ospfv3-MjgzMg%3D%3D>) task. Refer to the **Base IPv6 Diagram** in order to complete this task.

## Task

- Change the OSPF Network Type of the link between R5 and XR1 to Point-to-Point.

## Configuration [Click to collapse](#)

```
R5:
interface GigabitEthernet1.519
  ipv6 ospf network point-to-point

XR1:
router ospfv3 1
  area 0
  interface GigabitEthernet0/0/0.519
    network point-to-point
  !
  !
  !
```

## Verification

XR1 now runs OSPF Network Type Point-to-Point on the Ethernet link to R5, while still running the default Network Type Broadcast on the Ethernet link to R6.

```
RP/0/0/CPU0:XR1#show ospfv3 interface | include "line protocol|Network Type"
```

```
Tue Apr 21 21:52:55.944 UTC
```

```
GigabitEthernet0/0/0/0.519 is up, line protocol is up
```

```
Network Type POINT_TO_POINT, Cost: 1
```

```
GigabitEthernet0/0/0/0.619 is up, line protocol is up
```

```
Network Type BROADCAST, Cost: 1
```

```
GigabitEthernet0/0/0/0.1920 is up, line protocol is up
```

```
Network Type BROADCAST, Cost: 1
```

```
Loopback0 is up, line protocol is up
```

```
Network Type LOOPBACK, Cost: 0
```

Like in OSPFv2, changing Ethernet links that connect only two routers together to Network Type Point-to-Point removes the need for the Network LSA (LSA Type 2) that is generated by the Designated Router. This both simplifies the SPF lookup in the database and makes the size of the database smaller. As seen below, a Network LSA is generated for all Ethernet links with the exception of the link between R5 and XR1.

Tue Apr 21 21:53:53.700 UTC

## OSPFv3 Router with ID (19.19.19.19) (Process ID 1)

## Router Link States (Area 0)

ADV Router	Age	Seq#	Fragment ID	Link count	Bits
1.1.1.1	151	0x80000002	0	1	None
2.2.2.2	137	0x80000004	0	3	None
3.3.3.3	118	0x80000004	0	3	None
4.4.4.4	78	0x80000004	0	4	None
5.5.5.5	60	0x80000006	0	3	None
6.6.6.6	76	0x80000003	0	4	None
19.19.19.19	68	0x8000005f	0	3	None
20.20.20.20	1938	0x80000055	0	1	None

## Net Link States (Area 0)

ADV Router	Age	Seq#	Link ID	Rtr count
2.2.2.2	150	0x80000001	13	2
3.3.3.3	147	0x80000001	11	2
3.3.3.3	118	0x80000001	13	2
4.4.4.4	136	0x80000001	11	2
4.4.4.4	136	0x80000001	12	2
4.4.4.4	123	0x80000001	13	2
6.6.6.6	76	0x80000001	12	2
6.6.6.6	76	0x80000001	13	2
19.19.19.19	115	0x80000001	8	2
19.19.19.19	1775	0x80000054	9	2

## Link (Type-8) Link States (Area 0)

ADV Router	Age	Seq#	Link ID	Interface
19.19.19.19	1775	0x80000054	9	Gi0/0/0/0.1920
20.20.20.20	1938	0x80000054	7	Gi0/0/0/0.1920
5.5.5.5	121	0x80000001	13	Gi0/0/0/0.519
19.19.19.19	68	0x80000055	7	Gi0/0/0/0.519
6.6.6.6	116	0x80000001	14	Gi0/0/0/0.619
19.19.19.19	1775	0x80000054	8	Gi0/0/0/0.619

## Intra Area Prefix Link States (Area 0)

ADV Router	Age	Seq#	Link ID	Ref-lstyp	Ref-LSID
1.1.1.1	151	0x80000003	0	0x2001	0
2.2.2.2	137	0x80000005	0	0x2001	0
2.2.2.2	150	0x80000001	13312	0x2002	13
3.3.3.3	118	0x80000005	0	0x2001	0
3.3.3.3	147	0x80000001	11264	0x2002	11
3.3.3.3	118	0x80000001	13312	0x2002	13
4.4.4.4	78	0x80000005	0	0x2001	0
4.4.4.4	136	0x80000001	11264	0x2002	11
4.4.4.4	136	0x80000001	12288	0x2002	12

4.4.4.4	123	0x80000001 13312	0x2002	13
5.5.5.5	77	0x80000002 0	0x2001	0
6.6.6.6	76	0x80000002 0	0x2001	0
6.6.6.6	76	0x80000001 12288	0x2002	12
6.6.6.6	76	0x80000001 13312	0x2002	13
19.19.19.19	69	0x80000060 0	0x2001	0
19.19.19.19	115	0x80000001 8192	0x2002	8
19.19.19.19	1775	0x80000054 9216	0x2002	9
20.20.20.20	1938	0x80000056 0	0x2001	0

XR1 continues generating a Network LSA for the Broadcast or Non-Broadcast Network Type links on which it is the DR.

```
RP/0/0/CPU0:XR1#show ospfv3 database network adv-router 19.19.19.19
```

```
Tue Apr 21 21:54:34.157 UTC
```

```
OSPFv3 Router with ID (19.19.19.19) (Process ID 1)
```

```
Net Link States (Area 0)
```

```
LS age: 155
```

```
Options: (V6-Bit E-Bit R-Bit DC-Bit)
```

```
LS Type: Network Links
```

```
Link State ID: 8 (Interface ID of Designated Router)
```

```
Advertising Router: 19.19.19.19
```

```
LS Seq Number: 80000001
```

```
Checksum: 0x1a36
```

```
Length: 32
```

```
Attached Router: 19.19.19.19
```

```
Attached Router: 6.6.6.6
```

```
LS age: 1816
```

```
Options: (V6-Bit E-Bit R-Bit DC-Bit)
```

```
LS Type: Network Links
```

```
Link State ID: 9 (Interface ID of Designated Router)
```

```
Advertising Router: 19.19.19.19
```

```
LS Seq Number: 80000054
```

```
Checksum: 0x289b
```

```
Length: 32
```

```
Attached Router: 19.19.19.19
```

```
Attached Router: 20.20.20.20
```

R6 is the DR for its links to R5 and R4, therefore it generates a Network LSA for each of these.

```
RP/0/0/CPU0:XR1#show ospfv3 database network adv-router 6.6.6.6
```

```
Tue Apr 21 21:55:29.083 UTC
```

```
OSPFv3 Router with ID (19.19.19.19) (Process ID 1)
```

```
Net Link States (Area 0)
```

```
LS age: 171
```

```
Options: (V6-Bit E-Bit R-Bit DC-Bit)
```

```
LS Type: Network Links
```

```
Link State ID: 12 (Interface ID of Designated Router)
```

```
Advertising Router: 6.6.6.6
```

```
LS Seq Number: 80000001
```

```
Checksum: 0x5963
```

```
Length: 32
```

```
Attached Router: 6.6.6.6
```

```
Attached Router: 4.4.4.4
```

```
LS age: 171
```

```
Options: (V6-Bit E-Bit R-Bit DC-Bit)
```

```
LS Type: Network Links
```

```
Link State ID: 13 (Interface ID of Designated Router)
```

```
Advertising Router: 6.6.6.6
```

```
LS Seq Number: 80000001
```

```
Checksum: 0x8136
```

```
Length: 32
```

```
Attached Router: 6.6.6.6
```

```
Attached Router: 5.5.5.5
```

« OSPFv3 (/workbook/view/service-provider-v4/task/ospfv3-MjgzMg%3D%3D) | OSPFv3 Path Selection (/workbook/view/service-provider-v4/task/ospfv3-path-selection-MjgzNA%3D%3D) »