



Cisco Systems Advanced Services

NREN TF - OSPFv3 Lab

OSPFv3 Lab session

Version <1.0>

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OSPFv3 Lab session

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Document Control

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History

Table 1 *Revision History*

Version No.	Issue Date	Status	Reason for Change
1.0	15 March 2004	released	First Release

Review

Table 2 *Revision Review*

Reviewer's Details	Version No.	Date
tbc	<Version number>	<dd-mmm-yyyy>



Document Purpose

This document provides guidelines for executing in the OSPFv3 lab during the Routing Virtual team IPv6 routing workshop, 12 may 2004

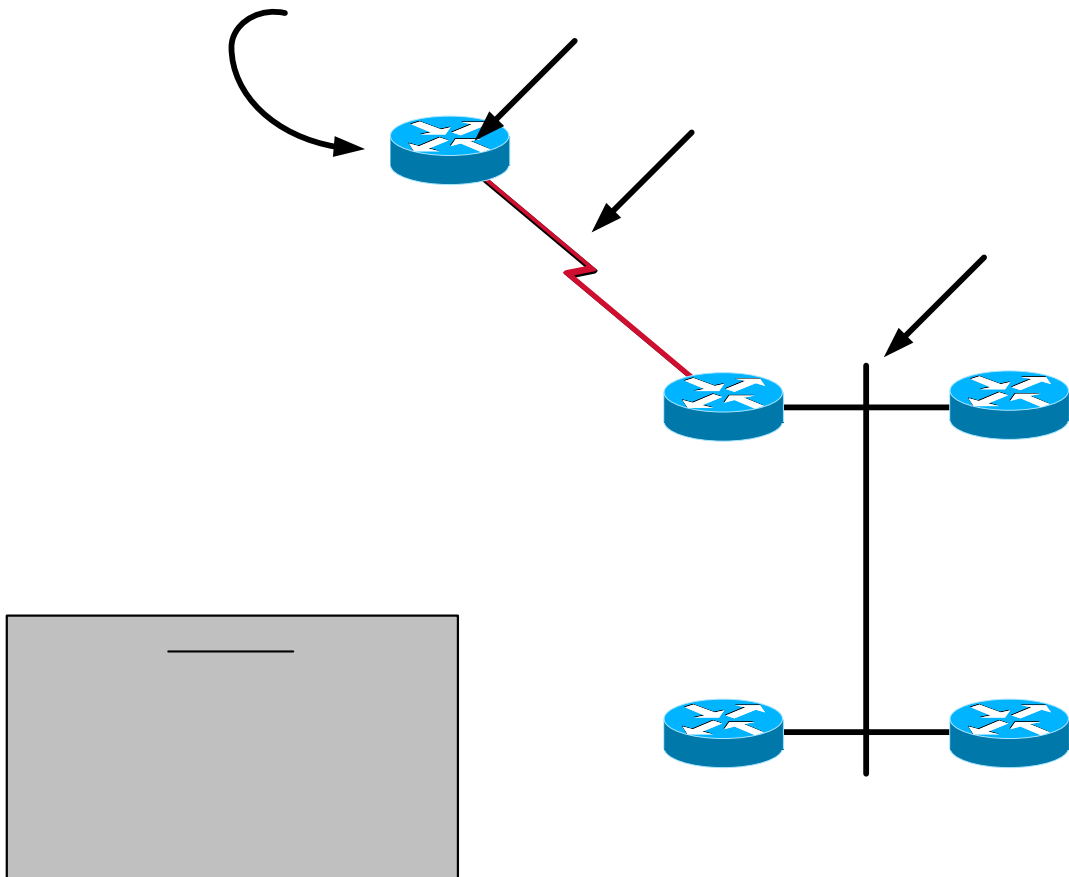


Lab Setup

The Lab Topology

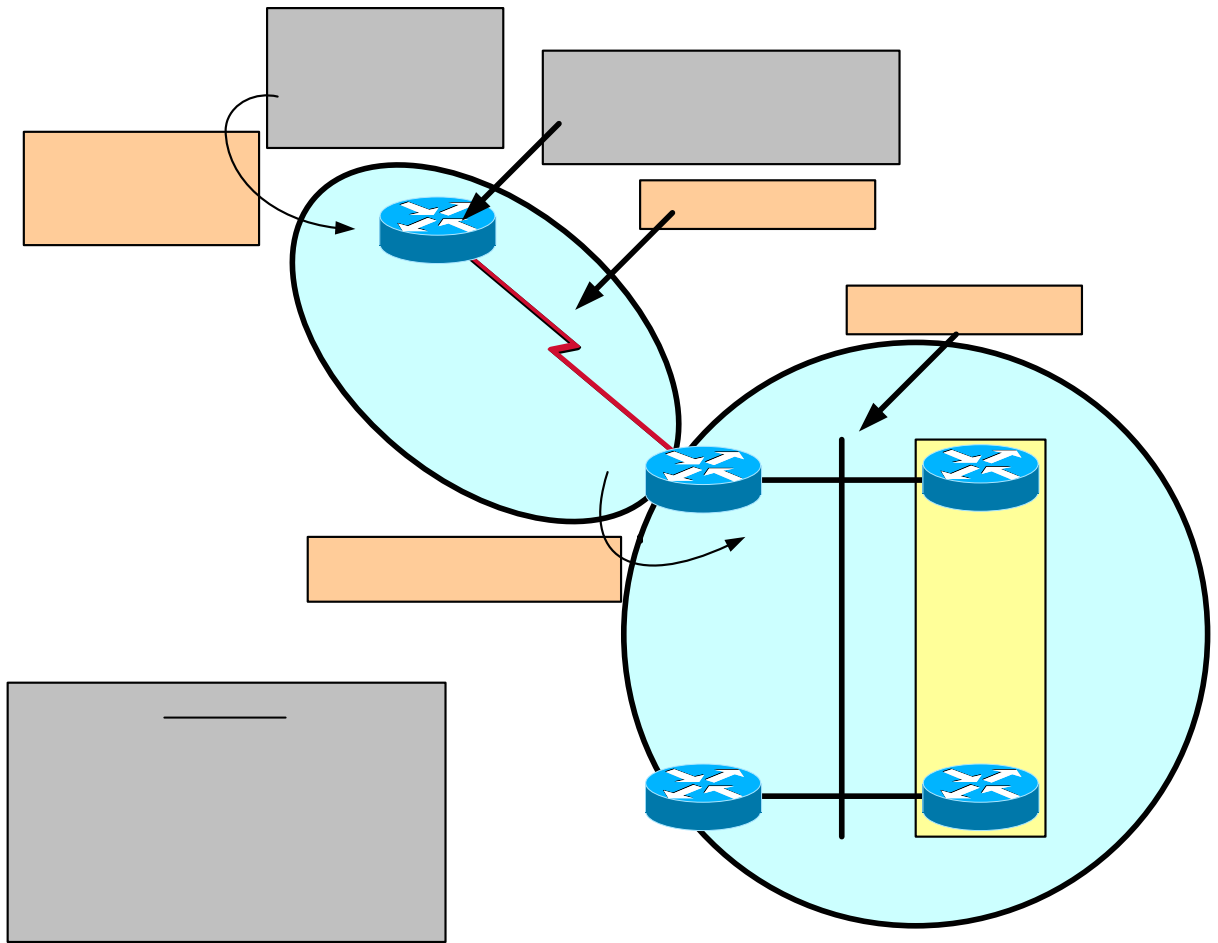
The lab used for the OSPFv3 practical is shown below. All IPv6 addresses have been configured.

There is telnet access to the console ports prepared (see later for connection details). It is possible to telnet from each router to any other router by means of the loopback0 address of the equipment. Please note that there is no IPv4 address configured on any of the routers.



The External prefixes on **'Router101'** have been configured as Static routes to the NULL interfaces. When required these need to be redistributed into the OSPFv3 process

The topology described above is how the practical will start. After configuration of the OSPFv3 protocol the following topology will be achieved.



The Lab notes will guide through the session on how the final topology can be achieved. The lab user is invited to check the OSPFv3 database and debugging the protocol.

How to achieve access to the lab equipment:

Login-id: Cisco
Password: Cisco

Redistributed
 into
 OSPFv3 Area 0.0.0.

Lab Group 1	
Router 101	telnet 144.254.9.108 port 3101
Router 102	telnet 144.254.9.108 port 3102
Router 103	telnet 144.254.9.108 port 3103
Router 104	telnet 144.254.9.108 port 3104
Router 105	telnet 144.254.9.108 port 3105
Lab Group 2	
Router 101	telnet 144.254.9.108 port 3111

Router 102	telnet 144.254.9.108 port 3112
Router 103	telnet 144.254.9.108 port 3113
Router 104	telnet 144.254.9.108 port 3114
Router 105	telnet 144.254.9.108 port 3115
Lab Group 3	
Router 101	telnet 144.254.9.108 port 3121
Router 102	telnet 144.254.9.108 port 3122
Router 103	telnet 144.254.9.108 port 3123
Router 104	telnet 144.254.9.108 port 3124
Router 105	telnet 144.254.9.108 port 3125
Lab Group 4	
Router 101	telnet 144.254.9.108 port 3131
Router 102	telnet 144.254.9.108 port 3132
Router 103	telnet 144.254.9.108 port 3133
Router 104	telnet 144.254.9.108 port 3134
Router 105	telnet 144.254.9.108 port 3135

Lab Guidelines

Enabling OSPFv3 Process

Router101, 102,103, 104, 105

```

101(config)# 101(config)#ipv6 router ospf 100
101(config-rtr)#
*Mar 22 10:04:24.971: %OSPFv3-4-NORTRID: OSPFv3 process 100 could not pick a router-id,
please configure manually
101(config-rtr)#router-id 1.1.1.1
101(config-rtr)#

```

Repeat for router 102, 103, 104 and 105

The Router-id should be respectively 2.2.2.2, 3.3.3.3, 4.4.4.4 and 5.5.5.5

Enable OSPFv3 routing in Area 0.0.0.0

Router101 and 102

```

101(config-rtr)#int ser 1/0

```

```
101(config-if)#ipv6 ospf 100 area 0
101(config-if)#
```

Place all loopback interfaces in the OSPF area 0

```
102(config-rtr)#int ser 1/0
102(config-if)#ipv6 ospf 100 are 0
102(config-if)#
```

Place Loopback0 in the OSPF area 0

Check if neighborship is up and running

```
101#sho ipv6 ospf nei
```

```
Neighbor ID  Pri  State      Dead Time  Interface ID  Interface
2.2.2.2      1  FULL/-   00:00:30  3           Serial1/0
101#
```

```
102#sho ipv6 ospf nei
```

```
Neighbor ID  Pri  State      Dead Time  Interface ID  Interface
1.1.1.1      1  FULL/-   00:00:31  3           Serial1/0
102#
```

Check which interfaces have OSPFv3 enabled

```
101#sho ipv6 ospf int
```

Loopback103 is up, line protocol is up

```
Link Local Address FE80::2FF:FE99:D065, Interface ID 9
Area 0, Process ID 100, Instance ID 0, Router ID 1.1.1.1
Network Type LOOPBACK, Cost: 1
```

Loopback interface is treated as a stub Host

Loopback102 is up, line protocol is up

```
Link Local Address FE80::2FF:FE99:D065, Interface ID 8
Area 0, Process ID 100, Instance ID 0, Router ID 1.1.1.1
Network Type LOOPBACK, Cost: 1
```

Loopback interface is treated as a stub Host

Loopback101 is up, line protocol is up

```
Link Local Address FE80::2FF:FE99:D065, Interface ID 7
Area 0, Process ID 100, Instance ID 0, Router ID 1.1.1.1
Network Type LOOPBACK, Cost: 1
```

Loopback interface is treated as a stub Host

Loopback0 is up, line protocol is up

```
Link Local Address FE80::2FF:FE99:D065, Interface ID 6
Area 0, Process ID 100, Instance ID 0, Router ID 1.1.1.1
Network Type LOOPBACK, Cost: 1
```

Loopback interface is treated as a stub Host

Serial1/0 is up, line protocol is up

```

Link Local Address FE80::2FF:FE99:D065, Interface ID 3
Area 0, Process ID 100, Instance ID 0, Router ID 1.1.1.1
Network Type POINT_TO_POINT, Cost: 64
Transmit Delay is 1 sec, State POINT_TO_POINT,
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  Hello due in 00:00:02
Index 1/1/1, flood queue length 0
Next 0x0(0)/0x0(0)/0x0(0)
Last flood scan length is 2, maximum is 2
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1, Adjacent neighbor count is 1
  Adjacent with neighbor 2.2.2.2
Suppress hello for 0 neighbor(s)
101#

```

```

102#sho ipv6 ospf int
Loopback0 is up, line protocol is up
  Link Local Address FE80::A8BB:CCFF:FE00:6600, Interface ID 6
  Area 0, Process ID 100, Instance ID 0, Router ID 2.2.2.2
  Network Type LOOPBACK, Cost: 1
  Loopback interface is treated as a stub Host
Serial1/0 is up, line protocol is up
  Link Local Address FE80::A8BB:CCFF:FE00:6600, Interface ID 3
  Area 0, Process ID 100, Instance ID 0, Router ID 2.2.2.2
  Network Type POINT_TO_POINT, Cost: 64
  Transmit Delay is 1 sec, State POINT_TO_POINT,
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:08
  Index 1/1/1, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 2, maximum is 2
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 1.1.1.1
  Suppress hello for 0 neighbor(s)
102#

```

Check if Loopbacks have been distributed correctly

```

101#sho ipv6 route ospf
IPv6 Routing Table - 12 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
O 2001:798:100::2/128 [110/64]
  via FE80::A8BB:CCFF:FE00:6600, Serial1/0
101#

```

```

102#sho ipv6 rou ospf
IPv6 Routing Table - 11 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
O 2001:798:100::1/128 [110/64]
  via FE80::2FF:FE99:D065, Serial1/0
O 2001:801::1/128 [110/64]
  via FE80::2FF:FE99:D065, Serial1/0
O 2001:801::2/128 [110/64]
  via FE80::2FF:FE99:D065, Serial1/0
O 2001:801::3/128 [110/64]
  via FE80::2FF:FE99:D065, Serial1/0
102#

```

Verify the LSA types used

```

101#sho ipv6 ospf data

      OSPFv3 Router with ID (1.1.1.1) (Process ID 100)

      Router Link States (Area 0)

ADV Router  Age    Seq#    Fragment ID  Link count  Bits
1.1.1.1    269    0x80000006 0         1         None
2.2.2.2    242    0x80000003 0         1         None

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

ADV Router  Age    Seq#    Link ID  Interface
1.1.1.1    269    0x80000001 9        Lo103
1.1.1.1    275    0x80000001 8        Lo102
1.1.1.1    282    0x80000001 7        Lo101
1.1.1.1    292    0x80000001 6        Lo0
1.1.1.1    603    0x80000001 3        Se1/0
2.2.2.2    580    0x80000001 3        Se1/0

      Intra Area Prefix Link States (Area 0)

ADV Router  Age    Seq#    Link ID  Ref-Istype  Ref-LSID
1.1.1.1    269    0x80000005 0        0x2001      0
2.2.2.2    242    0x80000002 0        0x2001      0
101#

```

```

102#sho ipv6 ospf data

```

OSPFv3 Router with ID (2.2.2.2) (Process ID 100)

Router Link States (Area 0)

ADV Router	Age	Seq#	Fragment ID	Link count	Bits
1.1.1.1	336	0x80000006	0	1	None
2.2.2.2	309	0x80000003	0	1	None

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

ADV Router	Age	Seq#	Link ID	Interface
2.2.2.2	309	0x80000001	6	Lo0
1.1.1.1	670	0x80000001	3	Se1/0
2.2.2.2	647	0x80000001	3	Se1/0

Intra Area Prefix Link States (Area 0)

ADV Router	Age	Seq#	Link ID	Ref-lstype	Ref-LSID
1.1.1.1	336	0x80000005	0	0x2001	0
2.2.2.2	308	0x80000002	0	0x2001	0

102#

Is there DR/BDR?

Answer:

Enable OSPFv3 routing in Area 0.0.0.1

Router 102, 103

```
103(config-rtr)#int eth 0/0
103(config-if)#ipv6 ospf 100 are 0.0.0.1
103(config-if)#
Place the Loopback0 in area 0.0.0.1

102(config)#int eth 0/0
102(config-if)#ipv6 ospf 100 are 0.0.0.1
102(config-if)#
*Mar 22 10:32:31.475: %OSPFv3-5-ADJCHG: Process 100, Nbr 3.3.3.3 on Ethernet0/0 from LOADING to FULL, Loading Done
102(config-if)#
```

Router 104, 105 with OSPF instance '1'

```
104(config-if)#int eth 0/0
104(config-if)#ipv6 ospf 100 area 0.0.0.1 instance 1
104(config-if)#int lo 0
104(config-if)#ipv6 ospf 100 area 0.0.0.1
104(config-if)#
```

```
*Mar 22 10:43:10.555: %OSPFv3-5-ADJCHG: Process 100, Nbr 5.5.5.5 on Ethernet0/0 from LOADING to FULL, Loading Done
```

```
104(config-if)#
```

```
105(config)#int eth 0/0
```

```
105(config-if)#ipv6 ospf 100 area 0.0.0.1 instance 1
```

```
105(config-if)#int lo 0
```

```
105(config-if)#ipv6 ospf 100 area 0.0.0.1
```

```
105(config-if)#
```

Check if neighborship is up and running

```
102#
```

```
102#sho ipv6 ospf nei
```

Neighbor ID	Pri	State	Dead Time	Interface ID	Interface
1.1.1.1	1	FULL/-	00:00:30	3	Serial1/0
3.3.3.3	1	FULL/DR	00:00:35	2	Ethernet0/0

```
102#
```

Why is there on Ethernet0/0 only one neighbour?

```
104#sho ipv6 ospf nei
```

Neighbor ID	Pri	State	Dead Time	Interface ID	Interface
5.5.5.5	1	FULL/BDR	00:00:34	2	Ethernet0/0

```
104#
```

Why does router 105 only have one neighbour?

Check if the neighbour status is correct on all routers in area 0.0.0.1

Check which interfaces have OSPFv3 enabled

Check with the 'sho ipv6 ospf int' command to see if all interfaces have been configured correctly and if the instance has been set correctly

Check if Loopbacks have been distributed correctly

Between router 105 and 104 we see only the loopbacks from between these two routers? Why?

```
105#sho ipv6 route
```

```
IPv6 Routing Table - 6 entries
```

```
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
```

```
U - Per-user Static route
```

```
I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
```

```
O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
```

```
ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
```

```
C 2001:798:3::/64 [0/0]
```

```
via ::, Ethernet0/0
```

```
L 2001:798:3::4/128 [0/0]
```

```
via ::, Ethernet0/0
```

```

O 2001:798:100::4/128 [110/10]
  via FE80::A8BB:CCFF:FE00:6800, Ethernet0/0
LC 2001:798:100::5/128 [0/0]
  via ::, Loopback0
L FE80::/10 [0/0]
  via ::, Null0
L FF00::/8 [0/0]
  via ::, Null0
105#

104#sho ipv6 route
IPv6 Routing Table - 6 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
C 2001:798:3::/64 [0/0]
  via ::, Ethernet0/0
L 2001:798:3::3/128 [0/0]
  via ::, Ethernet0/0
LC 2001:798:100::4/128 [0/0]
  via ::, Loopback0
O 2001:798:100::5/128 [110/10]
  via FE80::A8BB:CCFF:FE00:6900, Ethernet0/0
L FE80::/10 [0/0]
  via ::, Null0
L FF00::/8 [0/0]
  via ::, Null0
104#

```

On the Router 103 we see all correct prefixes, except the ones from 104 and 105:

```

103#
103#sho ipv6 route
IPv6 Routing Table - 11 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
OI 2001:798:2::/64 [110/74]
  via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
C 2001:798:3::/64 [0/0]
  via ::, Ethernet0/0
L 2001:798:3::2/128 [0/0]
  via ::, Ethernet0/0
OI 2001:798:100::1/128 [110/74]
  via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0

```

```

OI 2001:798:100::2/128 [110/10]
  via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
LC 2001:798:100::3/128 [0/0]
  via ::, Loopback0
OI 2001:801::1/128 [110/74]
  via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
OI 2001:801::2/128 [110/74]
  via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
OI 2001:801::3/128 [110/74]
  via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
L FE80::/10 [0/0]
  via ::, Null0
L FF00::/8 [0/0]
  via ::, Null0
103#

```

Verify the LSA types used

```
103#sho ipv6 ospf dat
```

```
OSPFv3 Router with ID (3.3.3.3) (Process ID 100)
```

```
Router Link States (Area 0.0.0.1)
```

ADV Router	Age	Seq#	Fragment ID	Link count	Bits
2.2.2.2	525	0x80000005	0	1	B
3.3.3.3	25	0x80000006	0	1	None

```
Net Link States (Area 0.0.0.1)
```

ADV Router	Age	Seq#	Link ID	Rtr count
3.3.3.3	517	0x80000002	2	2

```
Inter Area Prefix Link States (Area 0.0.0.1)
```

ADV Router	Age	Seq#	Prefix
2.2.2.2	525	0x80000002	2001:801::3/128
2.2.2.2	525	0x80000002	2001:801::2/128
2.2.2.2	525	0x80000002	2001:801::1/128
2.2.2.2	525	0x80000002	2001:798:100::1/128
2.2.2.2	525	0x80000002	2001:798:2::/64
2.2.2.2	525	0x80000002	2001:798:100::2/128

```
Link (Type-8) Link States (Area 0.0.0.1)
```

ADV Router	Age	Seq#	Link ID	Interface
3.3.3.3	26	0x80000002	6	Lo0
2.2.2.2	526	0x80000002	2	Et0/0
3.3.3.3	519	0x80000002	2	Et0/0

Intra Area Prefix Link States (Area 0.0.0.1)

ADV Router	Age	Seq#	Link ID	Ref-Istype	Ref-LSID
3.3.3.3	26	0x80000002 0	0x2001	0	
3.3.3.3	519	0x80000002 1002	0x2002	2	

103#

Is there DR/BDR? Which one for which area, try to change with setting DR priority

Is there more than one DR and BDR on the broadcast media? Why ?

Optional: Check with debugging what the hellos are doing

Check various OSPF debug commands to see the output and understand the results

Generating External Prefixes

Router101

Redistribute statics, Add tag, and use OSPFv3 metric-type 1

```
101(config)#ipv6 router ospf 100
101(config-rtr)#red static metric-type 1 metric 1000 tag 12345
101(config-rtr)#
```

Check LSA content (on 101, 102 and 103), check LSA type5 for content mapping

102#sho ipv6 ospf dat external

OSPFv3 Router with ID (2.2.2.2) (Process ID 100)

Type-5 AS External Link States

```
Routing Bit Set on this LSA
LS age: 125
LS Type: AS External Link
Link State ID: 0
Advertising Router: 1.1.1.1
LS Seq Number: 80000001
Checksum: 0xFCB7
Length: 40
Prefix Address: 2001:798:1::
Prefix Length: 64, Options: None
Metric Type: 1 (Comparable directly to link state metric)
Metric: 1000
External Route Tag: 12345
```

```
Routing Bit Set on this LSA
LS age: 125
LS Type: AS External Link
Link State ID: 1
Advertising Router: 1.1.1.1
LS Seq Number: 80000001
Checksum: 0xA7A3
Length: 40
Prefix Address: 2001:800:1::
Prefix Length: 64, Options: None
Metric Type: 1 (Comparable directly to link state metric)
Metric: 1000
External Route Tag: 12345
```

```
Routing Bit Set on this LSA
LS age: 127
LS Type: AS External Link
Link State ID: 2
Advertising Router: 1.1.1.1
LS Seq Number: 80000001
Checksum: 0xAD9B
Length: 40
Prefix Address: 2001:800:2::
Prefix Length: 64, Options: None
Metric Type: 1 (Comparable directly to link state metric)
Metric: 1000
External Route Tag: 12345
```

102#

102#

102#

Check how the externals get presented in a different OSPFv3 area. This can be checked on router 103.

```
103#sho ipv6 ospf dat external
```

```
OSPFv3 Router with ID (3.3.3.3) (Process ID 100)
```

```
Type-5 AS External Link States
```

```
Routing Bit Set on this LSA
LS age: 336
LS Type: AS External Link
Link State ID: 0
Advertising Router: 1.1.1.1
LS Seq Number: 80000001
Checksum: 0xFCB7
Length: 40
Prefix Address: 2001:798:1::
```

Prefix Length: 64, Options: None
 Metric Type: 1 (Comparable directly to link state metric)
 Metric: 1000
 External Route Tag: 12345

Routing Bit Set on this LSA

LS age: 336
 LS Type: AS External Link
 Link State ID: 1
 Advertising Router: 1.1.1.1
 LS Seq Number: 80000001
 Checksum: 0xA7A3
 Length: 40
 Prefix Address: 2001:800:1::
 Prefix Length: 64, Options: None
 Metric Type: 1 (Comparable directly to link state metric)
 Metric: 1000
 External Route Tag: 12345

Routing Bit Set on this LSA

LS age: 341
 LS Type: AS External Link
 Link State ID: 2
 Advertising Router: 1.1.1.1
 LS Seq Number: 80000001
 Checksum: 0xAD9B
 Length: 40
 Prefix Address: 2001:800:2::
 Prefix Length: 64, Options: None
 Metric Type: 1 (Comparable directly to link state metric)
 Metric: 1000
 External Route Tag: 12345

103#

The mapping of the OSPFv3 router ID from different area is done by the ABR router of an area. This mapping can be checked by the usage of following command:

103#sho ipv6 ospf dat inter-area router

OSPFv3 Router with ID (3.3.3.3) (Process ID 100)

Inter Area Router Link States (Area 0.0.0.1)

Routing Bit Set on this LSA

LS age: 476
 Options: (V6-Bit E-Bit R-bit DC-Bit)
 LS Type: Inter Area Router Links
 Link State ID: 16843009

Advertising Router: 2.2.2.2
 LS Seq Number: 80000001
 Checksum: 0x1F97
 Length: 32
 Metric: 64
 Destination Router ID: 1.1.1.1

103#

Area summarisation

Router102

Summary IPv6 prefixes from Loopback101, 102 and 103 originated at Router101 towards Area 0.0.0.1

The Routing table on Router 103 before any ABR summarisation is happening:

```
103#sho ipv6 route
IPv6 Routing Table - 14 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
OE1 2001:798:1::/64 [110/1074], tag 12345
    via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
OI 2001:798:2::/64 [110/74]
    via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
C 2001:798:3::/64 [0/0]
    via ::, Ethernet0/0
L 2001:798:3::2/128 [0/0]
    via ::, Ethernet0/0
OI 2001:798:100::1/128 [110/74]
    via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
OI 2001:798:100::2/128 [110/10]
    via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
LC 2001:798:100::3/128 [0/0]
    via ::, Loopback0
OE1 2001:800:1::/64 [110/1074], tag 12345
    via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
OE1 2001:800:2::/64 [110/1074], tag 12345
    via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
OI 2001:801::1/128 [110/74]
    via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
OI 2001:801::2/128 [110/74]
    via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
OI 2001:801::3/128 [110/74]
    via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
L FE80::/10 [0/0]
    via ::, Null0
```

```
L FF00::/8 [0/0]
  via ::, Null0
103#
```

Now on Router 102 the summarisation command gets added:

```
102(config)#ipv6 router ospf 100
102(config-rtr)#area 0.0.0.0 range 2001:801::/32
102(config-rtr)#
```

Now on Router 103 the summary Inter-area route can be observed:

```
103#sho ipv6 route
IPv6 Routing Table - 12 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
OE1 2001:798:1::/64 [110/1074], tag 12345
    via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
OI 2001:798:2::/64 [110/74]
    via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
C 2001:798:3::/64 [0/0]
    via ::, Ethernet0/0
L 2001:798:3::2/128 [0/0]
    via ::, Ethernet0/0
OI 2001:798:100::1/128 [110/74]
    via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
OI 2001:798:100::2/128 [110/10]
    via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
LC 2001:798:100::3/128 [0/0]
    via ::, Loopback0
OE1 2001:800:1::/64 [110/1074], tag 12345
    via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
OE1 2001:800:2::/64 [110/1074], tag 12345
    via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
OI 2001:801::/32 [110/74]
    via FE80::A8BB:CCFF:FE00:6600, Ethernet0/0
L FE80::/10 [0/0]
    via ::, Null0
L FF00::/8 [0/0]
    via ::, Null0
103#
```

Check LSA content in area 0.0.0.1

```
103#sho ipv6 ospf dat inter-area prefix
```

OSPFv3 Router with ID (3.3.3.3) (Process ID 100)

Inter Area Prefix Link States (Area 0.0.0.1)

Routing Bit Set on this LSA

LS age: 1059

LS Type: Inter Area Prefix Links

Link State ID: 3

Advertising Router: 2.2.2.2

LS Seq Number: 80000003

Checksum: 0xB8E5

Length: 44

Metric: 64

Prefix Address: 2001:798:100::1

Prefix Length: 128, Options: None

Routing Bit Set on this LSA

LS age: 1059

LS Type: Inter Area Prefix Links

Link State ID: 4

Advertising Router: 2.2.2.2

LS Seq Number: 80000003

Checksum: 0xD312

Length: 36

Metric: 64

Prefix Address: 2001:798:2::

Prefix Length: 64, Options: None

Routing Bit Set on this LSA

LS age: 1060

LS Type: Inter Area Prefix Links

Link State ID: 5

Advertising Router: 2.2.2.2

LS Seq Number: 80000003

Checksum: 0x3D9E

Length: 44

Metric: 0

Prefix Address: 2001:798:100::2

Prefix Length: 128, Options: None

Routing Bit Set on this LSA

LS age: 117

LS Type: Inter Area Prefix Links

Link State ID: 6

Advertising Router: 2.2.2.2

LS Seq Number: 80000001

Checksum: 0x7D25

Length: 32

Metric: 64
Prefix Address: 2001:801::
Prefix Length: 32, Options: None

103#

Check routers 104 and 105 once more

104#

104#sho ipv6 ospf dat inter-area prefix

OSPFv3 Router with ID (4.4.4.4) (Process ID 100)

104#

104#

104#

105#sho ipv6 ospf dat inter-area prefix

OSPFv3 Router with ID (5.5.5.5) (Process ID 100)

105#



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