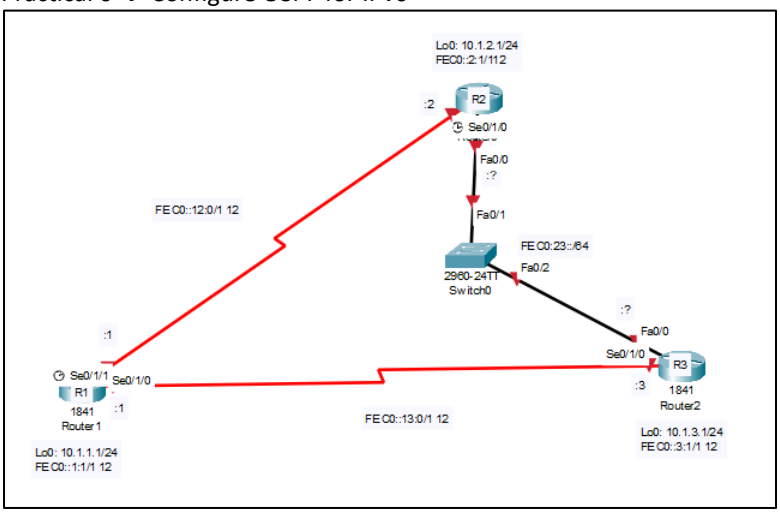
Practical 6 → Configure OSPF for IPv6




Step 1→ Configuring the host name and loopback interfaces.

```
R1(config)#int Lo0

R1(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up

R1(config-if)#ip add 10.1.1.1 255.255.255.0
R1(config-if)#ipv6 add FEC0::1:1/112
R1(config-if)#
```

```
R2(config)#int Lo0

R2(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up

R2(config-if)#ip add 10.1.2.1 255.255.255.0
R2(config-if)#ipv6 add FEC0::2:1/112
R2(config-if)#
```

STEP 2→ Configure static IPv6 addresses.

```
R1(config-if)#int Se0/1/0
R1(config-if)#ipv6 add FEC0::12:1/112
R1(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
R1(config-if)#int Se0/1/1
R1(config-if)#ipv6 add FEC0::13:1/112
R1(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/1/1, changed state to down
R1(config-if)#
```

```
R2>en
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#int Se0/1/0
R2(config-if)#ipv6 add FEC0::12:1/112
R2(config-if)#no shut

R2(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up
```

```
R2(config-if)#int Se0/1/0
R2(config-if)#ipv6 add FEC0::12:2/112
R2(config-if)#no shut
R2(config-if)#
```

```
R3>en
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#int Se0/1/1
R3(config-if)#ipv6 add FEC0::13:3/112
R3(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/1/1, changed state to down
R3(config-if)#
```

STEP 3→ Using ping command to verify local subnet connectivity.

```
R1>en
R1#ping FEC0::12:2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to FEC0::12:2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 7/12/14 ms

R1#ping FEC0::13:3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to FEC0::13:3, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 7/10/17 ms
```

STEP 4→ Change a link local address on an interface.

```
R1#sh ipv6 int Se0/1/0
Serial0/1/0 is up, line protocol is up
  IPv6 is enabled, link-local address is FE80::201:63FF:FEC1:4701
  No Virtual link-local address(es):
  Global unicast address(es):
    FEC0::12:1, subnet is FEC0::12:0/112
  Joined group address(es):
    FF02::1
    FF02::1:FF12:1
    FF02::1:FFC1:4701
  MTU is 1500 bytes
  ICMP error messages limited to one every 100 milliseconds
  ICMP redirects are enabled
  ICMP unreachables are sent
  ND DAD is enabled, number of DAD attempts: 1
  ND reachable time is 30000 milliseconds
R1#
```

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#int Se0/1/0
R1(config-if)#ipv6 add FE80::1 link-local
R1(config-if)#
```

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#int Se0/1/0
R2(config-if)#ipv6 add FE80::2 link-local
R2(config-if)#
```

```
R1#sh ipv6 int Se0/1/0
Serial0/1/0 is up, line protocol is up
  IPv6 is enabled, link-local address is FE80::1
  No Virtual link-local address(es):
  Global unicast address(es):
    FEC0::12:1, subnet is FEC0::12:0/112
  Joined group address(es):
    FF02::1
    FF02::1:FF00:1
    FF02::1:FF12:1
  MTU is 1500 bytes
  ICMP error messages limited to one every 100 milliseconds
  ICMP redirects are enabled
  ICMP unreachables are sent
  ND DAD is enabled, number of DAD attempts: 1
  ND reachable time is 30000 milliseconds
R1#
```

```
R2#sh ipv6 int Se0/1/0
Serial0/1/0 is up, line protocol is up
  IPv6 is enabled, link-local address is FE80::2
  No Virtual link-local address(es):
  Global unicast address(es):
    FEC0::12:2, subnet is FEC0::12:0/112
  Joined group address(es):
    FF02::1
    FF02::1:FF00:2
    FF02::1:FF12:2
  MTU is 1500 bytes
  ICMP error messages limited to one every 100 milliseconds
  ICMP redirects are enabled
  ICMP unreachables are sent
  ND DAD is enabled, number of DAD attempts: 1
  ND reachable time is 30000 milliseconds
R2#
```

```
R2#ping FE80::1
Output Interface: Serial0/1/0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to FE80::1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/13/34 ms

R2#
```

STEP 5→ Configure EUI(Extended Unique Identifier) 64 addresses.(the one below is step5)

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#int Fa0/0
R2(config-if)#ipv6 add FEC0:23::/64 eui-64
R2(config-if)#no shut
```

```
R3>en
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#int Fa0/0
R3(config-if)#ipv6 add FEC0:23::/64 eui-64
R3(config-if)#no shut

R3(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
```

```
R3#sh ipv6 int fa0/0
FastEthernet0/0 is up, line protocol is up
  IPv6 is enabled, link-local address is FE80::240:BFF:FE7C:1D01
  No Virtual link-local address(es):
  Global unicast address(es):
    FEC0:23::240:BFF:FE7C:1D01, subnet is FEC0:23::/64 [EUI]
  Joined group address(es):
    FF02::1
    FF02::1:FF7C:1D01
  MTU is 1500 bytes
  ICMP error messages limited to one every 100 milliseconds
  ICMP redirects are enabled
  ICMP unreachables are sent
  ND DAD is enabled, number of DAD attempts: 1
  ND reachable time is 30000 milliseconds
```

```
R2#sh ipv6 int fa0/0
FastEthernet0/0 is up, line protocol is up
  IPv6 is enabled, link-local address is FE80::290:CFF:FEA3:DB01
  No Virtual link-local address(es):
  Global unicast address(es):
    FEC0:23::290:CFF:FEA3:DB01, subnet is FEC0:23::/64 [EUI]
  Joined group address(es):
    FF02::1
    FF02::1:FFA3:DB01
  MTU is 1500 bytes
  ICMP error messages limited to one every 100 milliseconds
  ICMP redirects are enabled
  ICMP unreachables are sent
  ND DAD is enabled, number of DAD attempts: 1
  ND reachable time is 30000 milliseconds
```

Step 6→ Enable ipv6 routing and CEF(Cisco Express Forwarding).

```
R1>en
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#ipv6 unicast-routing
R1(config)#ipv6 cef
%IPv6 CEF was enabled but you must enable IPv4 CEF to make it run
R1(config)#
```

Step 7→ Configure OSPF version 3.

```
R1(config)#int Lo0
R1(config-if)#ipv6 ospf 1 area 0
R1(config-if)#int Se0/1/0
R1(config-if)#ipv6 ospf 1 area 0
R1(config-if)#int Se0/1/1
R1(config-if)#ipv6 ospf 1 area 0
R1(config-if)#
```

```
R2(config)#int Lo0
R2(config-if)#ipv6 ospf 1 area 0
R2(config-if)#int Se0/1/0
R2(config-if)#ipv6 ospf 1 area 0
R2(config-if)#
00:29:44: %OSPFv3-5-ADJCHG: Process 1, Nbr 10.1.1.1 on Serial0/1/0
Loading Done

R2(config-if)#int fa0/0
R2(config-if)#ipv6 ospf 1 area 0
R2(config-if)#
```

```
R3(config)#int Lo0
R3(config-if)#ipv6 ospf 1 area 0
R3(config-if)#int Se0/1/0
R3(config-if)#ipv6 ospf 1 area 0
R3(config-if)#
00:31:18: %OSPFv3-5-ADJCHG: Process 1, Nbr 10.1.1.1 on Serial0/1/0 from
Loading Done

R3(config-if)#int fa0/0
R3(config-if)#ipv6 ospf 1 area 0
R3(config-if)#
00:31:47: %OSPFv3-5-ADJCHG: Process 1, Nbr 10.1.2.1 on FastEthernet0/0
FULL, Loading Done
```

```
R1#sh ipv6 ospf neighbor

Neighbor ID     Pri   State           Dead Time   Interface ID    Interface
10.1.2.1          0   FULL/  -        00:00:33    5               Serial0/1/0
10.1.3.1          0   FULL/  -        00:00:30    5               Serial0/1/1
R1#
```

```
R2#sh ipv6 ospf neighbor

Neighbor ID     Pri   State           Dead Time   Interface ID    Interface
10.1.1.1          0   FULL/  -        00:00:31    5               Serial0/1/0
10.1.3.1          1   FULL/BDR        00:00:31    1               FastEthernet0/0
```

```
R3#sh ipv6 ospf neighbor

Neighbor ID     Pri   State           Dead Time   Interface ID    Interface
10.1.2.1          1   FULL/DR         00:00:34    1               FastEthernet0/0
10.1.1.1          0   FULL/  -        00:00:34    6               Serial0/1/0
```