
Routing
Switching
Tigers
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IPv6
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IPv6-RIP

Disclaimer

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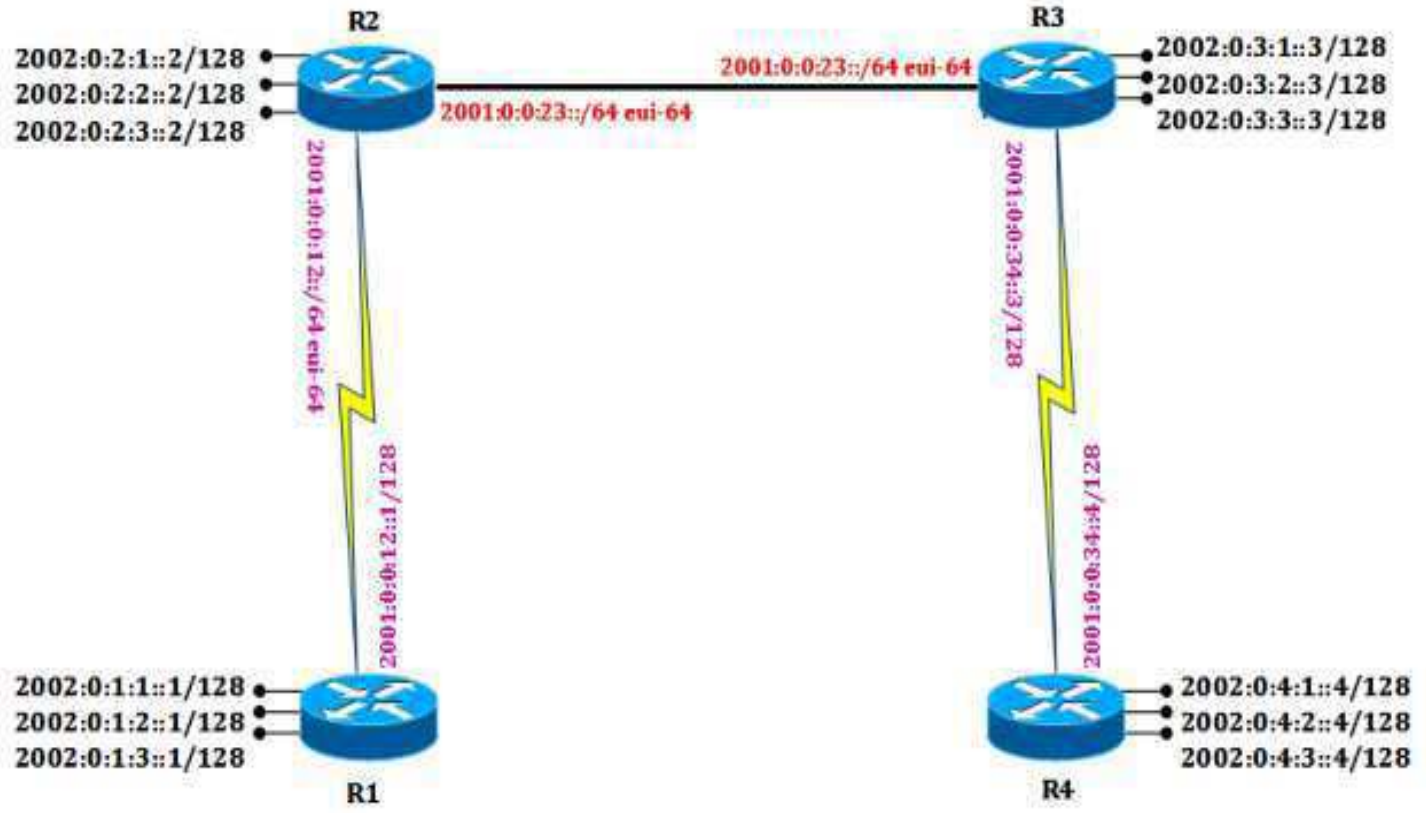

R1 Router:

```
!
ipv6 unicast-routing
ipv6 cef
!
!
!
interface Loopback0&
ipv6 address 2002:0:1:1::1/128
ipv6 rip RIPng enable
!
!
interface Loopback1&
ipv6 address 2002:0:1:2::1/128
ipv6 rip RIPng enable
!
!
interface Loopback2&
ipv6 address 2002:0:1:3::1/128
ipv6 rip RIPng enable
!
!
interface Serial1/0&
ipv6 address 2001:0:0:12::1/128
ipv6 rip RIPng enable
!
!
ipv6 router rip RIPng
!
```

R2 Router:

```
!
ipv6 unicast-routing
ipv6 cef
!
!
interface Loopback0
ipv6 address 2002:0:2:1::2/128
!
```

R4 Router:

```
!
ipv6 unicast-routing
ipv6 cef
!
interface Loopback0
ipv6 address 2002:0:4:1::4/128
ipv6 rip RIPng enable
!
!
interface Loopback1
ipv6 address 2002:0:4:2::4/128
ipv6 rip RIPng enable
!
!
interface Loopback2
ipv6 address 2002:0:4:3::4/128
ipv6 rip RIPng enable
!
!
interface Serial1/0
ipv6 address 2001:0:0:34::4/128
ipv6 rip RIPng enable
!
!
ipv6 router rip RIPng
!
```

R3 Router:

```
!
ipv6 unicast-routing
ipv6 cef
!
!
interface Loopback0
ipv6 address 2002:0:3:1::3/128
ipv6 rip RIPng enable
!
!
```

```
!
interface Loopback1
ipv6 address 2002:0:2:2::2/128
!
!
interface Loopback2
ipv6 address 2002:0:2:3::2/128
!
!
interface Serial1/0
ipv6 address 2001:0:0:12::/64 eui-64
ipv6 rip RIPng enable
clock rate 64000
!
!
interface FastEthernet2/0
ipv6 address 2001:0:0:23::/64 eui-64
ipv6 rip RIPng enable
!
!
ipv6 router rip RIPng
!
```

```
interface Loopback1
ipv6 address 2002:0:3:2::3/128
ipv6 rip RIPng enable
!
!
interface Loopback2
ipv6 address 2002:0:3:3::3/128
ipv6 rip RIPng enable
!
!
interface Serial1/0
ipv6 address 2001:0:0:34::3/128
ipv6 rip RIPng enable
clock rate 64000
!
!
interface FastEthernet2/0
ipv6 address 2001:0:0:23::/64 eui-64
ipv6 rip RIPng enable
!
!
ipv6 router rip RIPng
!
```

Note: We can configure a /128 address (host specific mask) on any interface but it will not communicate with any directly connected router until route for the network to which that IPv6 address belongs is not provided to the router.

Verification:

R1#sh ipv6 rip

RIP process "RIPng", port 521, multicast-group FF02::9, pid 285
Administrative distance is 120, Maximum paths is 16
Updates every 30 seconds, expire after 180
Holddown lasts 0 seconds, garbage collect after 120
Split horizon is on; poison reverse is off
Default routes are not generated
Periodic updates 13, trigger updates 2
Interfaces:
Serial1/0
Loopback2
Loopback1
Loopback0

Redistribution:
None
R2#sh ipv6 rip
RIP process "RIPng", port 521, multicast-group FF02::9, pid 285 (Rip process with name RIPng is enabled on router and it uses UDP port no. 521 and it has joined multicast group FF02::9 for exchanging updates with other RIP Routers, RIP is using local process ID no 285 on router)
Administrative distance is 120, Maximum paths is 16 (Default Administrative Distance (AD Value) used by RIPng is also 120, Maximum number of paths on which load balancing can be done by RIPng is 16)
Updates every 30 seconds, expire after 180 (RIPng will send updates to its peers at every 30 seconds, and will expire routes received from a neighbor id does not receive updates from that peer for a period of 180 seconds)
Holddown lasts 0 seconds, garbage collect after 120
Split horizon is on; poison reverse is off (Split Horizon method of loop prevention is used in RIPng and Poison Reverse is off by default)
Default routes are not generated
Periodic updates 20, trigger updates 1
Interfaces:
FastEthernet2/0
Serial1/0 (RIPng has not been enabled on any Loopback of R2, so they are not advertised in RIP updates)
Redistribution:
None
R3#sh ipv6 rip
RIP process "RIPng", port 521, multicast-group FF02::9, pid 285
Administrative distance is 120 Maximum paths is 16
Updates every 30 seconds, expire after 180
Holddown lasts 0 seconds, garbage collect after 120
Split horizon is on; poison reverse is off
Default routes are not generated
Periodic updates 22, trigger updates 2
Interfaces:
FastEthernet2/0
Serial1/0
Loopback2
Loopback1
Loopback0
Redistribution:
None
R4#sh ipv6 rip
RIP process "RIPng", port 521, multicast-group FF02::9, pid 285
Administrative distance is 120. Maximum paths is 16
Updates every 30 seconds, expire after 180

Holddown lasts 0 seconds, garbage collect after 120
Split horizon is on; poison reverse is off
Default routes are not generated
Periodic updates 25, trigger updates 1
Interfaces:
Serial1/0
Loopback2
Loopback1
Loopback0
Redistribution:
None

R1#sh ipv6 route

<output omitted>
R 2001:0:0:12::/64 [120/2]
via FE80::C802:13FF:FEE7:0, Serial1/0
LC 2001:0:0:12::1/128 [0/0]
via Serial1/0, receive (A different mask has been used on the connected interfaces so for the same network entry is made twice by RIP)
R 2001:0:0:23::/64 [120/2]
via FE80::C802:13FF:FEE7:0, Serial1/0 (Same mask has been used on connected interfaces, so only a single entry for the network made by RIP)
R 2001:0:0:34::3/128 [120/3]
via FE80::C802:13FF:FEE7:0, Serial1/0
R 2001:0:0:34::4/128 [120/4]
via FE80::C802:13FF:FEE7:0, Serial1/0 (Same mask but /128 i.e. host specific is used so different entries for same network is made by RIP)
LC 2002:0:1:1::1/128 [0/0]
via Loopback0, receive
LC 2002:0:1:2::1/128 [0/0]
via Loopback1, receive (C-means the connected network to the interface network)
LC 2002:0:1:3::1/128 [0/0]
via Loopback2, receive (L-represents local to router. Entries are made for /128 connected addresses. For this specific connected IPv6 address packet should be received and processed by router)
R 2002:0:3:1::3/128 [120/3]
via FE80::C802:13FF:FEE7:0, Serial1/0
R 2002:0:3:2::3/128 [120/3]
via FE80::C802:13FF:FEE7:0, Serial1/0
R 2002:0:3:3::3/128 [120/3]
via FE80::C802:13FF:FEE7:0, Serial1/0
R 2002:0:4:1::4/128 [120/4]

via FE80::C802:13FF:FEE7:0, Serial1/0
R 2002:0:4:2::4/128 [120/4]
via FE80::C802:13FF:FEE7:0, Serial1/0
R 2002:0:4:3::4/128 [120/4]
via FE80::C802:13FF:FEE7:0, Serial1/0 (R-These routes has been learned by RIP as RIPng process)
L FF00::/8 [0/0]
via Null0, receive (Router has created a null 0 for anycast IPv6 network FF00::/8 which means any IP packet with destination address as anycast IP will be discarded by router)

R2#sh ipv6 route

< output omitted>
C 2001:0:0:12::/64 [0/0]
via Serial1/0, directly connected
R 2001:0:0:12::1/128 [120/2]
via FE80::C801:13FF:FEE7:0, Serial1/0
L 2001::12:C802:13FF:FEE7:0/128 [0/0]
via Serial1/0, receive
C 2001:0:0:23::/64 [0/0]
via FastEthernet2/0, directly connected
L 2001::23:C802:13FF:FEE7:38/128 [0/0]
via FastEthernet2/0, receive
R 2001:0:0:34::3/128 [120/2]
via FE80::C803:13FF:FEE7:38, FastEthernet2/0
R 2001:0:0:34::4/128 [120/3]
via FE80::C803:13FF:FEE7:38, FastEthernet2/0
R 2002:0:1:1::1/128 [120/2]
via FE80::C801:13FF:FEE7:0, Serial1/0
R 2002:0:1:2::1/128 [120/2]
via FE80::C801:13FF:FEE7:0, Serial1/0
R 2002:0:1:3::1/128 [120/2]
via FE80::C801:13FF:FEE7:0, Serial1/0
LC 2002:0:2:1::2/128 [0/0]
via Loopback0, receive
LC 2002:0:2:2::2/128 [0/0]
via Loopback1, receive
LC 2002:0:2:3::2/128 [0/0]
via Loopback2, receive
R 2002:0:3:1::3/128 [120/2]
via FE80::C803:13FF:FEE7:38, FastEthernet2/0
R 2002:0:3:2::3/128 [120/2]
via FE80::C803:13FF:FEE7:38, FastEthernet2/0

R 2002:0:3:3::3/128 [120/2]
via FE80::C803:13FF:FEE7:38, FastEthernet2/0
R 2002:0:4:1::4/128 [120/3]
via FE80::C803:13FF:FEE7:38, FastEthernet2/0
R 2002:0:4:2::4/128 [120/3]
via FE80::C803:13FF:FEE7:38, FastEthernet2/0
R 2002:0:4:3::4/128 [120/3]
via FE80::C803:13FF:FEE7:38, FastEthernet2/0
L FF00::/8 [0/0]
via Null0, receive
R3#sh ipv6 route
< output omitted>
R 2001:0:0:12::/64 [120/2]
via FE80::C802:13FF:FEE7:38, FastEthernet2/0
R 2001:0:0:12::1/128 [120/3]
via FE80::C802:13FF:FEE7:38, FastEthernet2/0
C 2001:0:0:23::/64 [0/0]
via FastEthernet2/0, directly connected
L 2001::23:C803:13FF:FEE7:38/128 [0/0]
via FastEthernet2/0, receive
LC 2001:0:0:34::3/128 [0/0]
via Serial1/0, receive
R 2001:0:0:34::4/128 [120/2]
via FE80::C800:13FF:FEE7:0, Serial1/0
R 2002:0:1:1::1/128 [120/3]
via FE80::C802:13FF:FEE7:38, FastEthernet2/0
R 2002:0:1:2::1/128 [120/3]
via FE80::C802:13FF:FEE7:38, FastEthernet2/0
R 2002:0:1:3::1/128 [120/3]
via FE80::C802:13FF:FEE7:38, FastEthernet2/0
LC 2002:0:3:1::3/128 [0/0]
via Loopback0, receive
LC 2002:0:3:2::3/128 [0/0]
via Loopback1, receive
LC 2002:0:3:3::3/128 [0/0]
via Loopback2, receive
R 2002:0:4:1::4/128 [120/2]
via FE80::C800:13FF:FEE7:0, Serial1/0
R 2002:0:4:2::4/128 [120/2]
via FE80::C800:13FF:FEE7:0, Serial1/0

R 2002:0:4:3::4/128 [120/2]
via FE80::C800:13FF:FEE7:0, Serial1/0
L FF00::/8 [0/0]
via Null0, receive
R4#sh ipv6 route
< output omitted>
R 2001:0:0:12::/64 [120/3]
via FE80::C803:13FF:FEE7:0, Serial1/0
R 2001:0:0:12::1/128 [120/4]
via FE80::C803:13FF:FEE7:0, Serial1/0
R 2001:0:0:23::/64 [120/2]
via FE80::C803:13FF:FEE7:0, Serial1/0
R 2001:0:0:34::3/128 [120/2]
via FE80::C803:13FF:FEE7:0, Serial1/0
LC 2001:0:0:34::4/128 [0/0]
via Serial1/0, receive
R 2002:0:1:1::1/128 [120/4]
via FE80::C803:13FF:FEE7:0, Serial1/0
R 2002:0:1:2::1/128 [120/4]
via FE80::C803:13FF:FEE7:0, Serial1/0
R 2002:0:1:3::1/128 [120/4]
via FE80::C803:13FF:FEE7:0, Serial1/0
R 2002:0:3:1::3/128 [120/2]
via FE80::C803:13FF:FEE7:0, Serial1/0
R 2002:0:3:2::3/128 [120/2]
via FE80::C803:13FF:FEE7:0, Serial1/0
R 2002:0:3:3::3/128 [120/2]
via FE80::C803:13FF:FEE7:0, Serial1/0
LC 2002:0:4:1::4/128 [0/0]
via Loopback0, receive
LC 2002:0:4:2::4/128 [0/0]
via Loopback1, receive
LC 2002:0:4:3::4/128 [0/0]
via Loopback2, receive
L FF00::/8 [0/0]
via Null0, receive