

Configuring IPv6 Routes

CIT 167

Chaz Davis

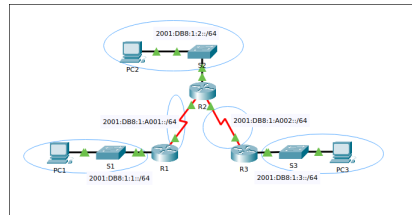
BCTC Spring 2020

February 5, 2020

Part 1: Examine the Network

i) a

There are 5 networks connected in the current topology



(a) Topology

Figure 1: Topology of the Network

ii) b

In Fig 1 we can see the R1 and R3 each have two connected networks, and that R2 has three connected networks.

iii) c

ipv6 route then we specify [the network, and prefix] then we specify either [next hop address or exit interface]

Part 2: Configure IPv6 static and default routes

i) **Enabling the Routers**

I logged into Each of the routers ena, conf t, and then typed in `ipv6 unicast-routing` into each terminal as seen in Fig 2.

```
R1>ena
R1#config t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ipv6 unicast-routing
R1(config)#
```

(a) R1 Enable

```
R2> ena
R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ipv6 unicast-routing
R2(config)#
```

(b) R2 Enable

```
R3>ena
R3#
R3#
R3#ena
R3#
R3#
R3#config t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#ipv6 unicast-routing
R3(config)#
```

(c) R3 Enable

Figure 2: Enabling IPv6

ii) Configuring the routers

Next I went to the three routers and manually entered the info for the network configuring each destination and each hop on the network. See Fig 3.

```
R1>ena
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ipv6 route 2001:DB8:1:2::/64
% Incomplete command.
R1(config)#ipv6 route 2001:DB8:1:2::/64 2001:DB8:1:A001::2
R1(config)#ipv6 route 2001:DB8:1:A002::/64 2001:DB8:1:A001::2
R1(config)#ipv6 route 2001:DB8:1:3::/64
% Incomplete command.
R1(config)#ipv6 route 2001:DB8:1:3::/64
% Incomplete command.
R1(config)#ipv6 route 2001:DB8:1:3::/64 2001:DB8:1:2::1/64
R1(config)#ipv6 route 2001:DB8:1:3::/64 2001:DB8:1:2::1/64
% Invalid input detected at '^' marker.
R1(config)#ipv6 route 2001:DB8:1:3::/64 2001:DB8:1:A001::2
R1(config)#
```

(a) Manually entering the network info on R1

```
R2>ena
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ipv6 route 2001:DB8:1:1::1/64 0/0/0
% Invalid input detected at '^' marker.
R2(config)#ipv6 route 2001:DB8:1:1::1/64 serial 0/0/0
R2(config)#ipv6 route 2001:DB8:1:3::1/64 serial 0/0/1
R2(config)#ipv6 route 2001:DB8:1:3::1/64 serial 0/0/1 2001:DB8:1:A002::2/64
% Invalid input detected at '^' marker.
R2(config)#
R2(config)#ipv6 route 2001:DB8:1:3::1/64 serial 0/0/1 2001:DB8:1:A002/64
R2(config)#ipv6 route 2001:DB8:1:3::1/64 serial 0/0/1 2001:DB8:1:A002::2
R2(config)#
```

(b) Manually entering the network info on R2

```
R3>ena
R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#ipv6 route ::/0
% Incomplete command.
R3(config)#ipv6 route ::/0 2001:DB8:1:A002::1
R3(config)#
```

(c) Manually entering the network info on R3

Figure 3: Manually Configuring the Destination IPv6 address, as well as the next hop address and Exit address

iii) Verifying Static Route Configurations

```
C:\>ipv6config
FastEthernet0 Connection:(default port)
Link-local IPv6 Address.....: FE80::20A:F3FF:FE15:580C
IPv6 Address.....: 2001:DB8:1:1::F/64
Default Gateway.....: FE80::1
DHCPv6 Client DUID.....: 00-01-00-01-99-2B-05-EC-00-0A-F3-15-58-0C

Bluetooth Connection:
Link-local IPv6 Address.....: ::
IPv6 Address.....: ::/8
Default Gateway.....: ::
DHCPv6 Client DUID.....: 00-01-00-01-99-2B-05-EC-00-0A-F3-15-58-0C

C:\>
```

(a) IPv6Config

```
R3#show ipv6 interface brief
GigabitEthernet0/0      [up/up]
FE80::3
2001:DB8:1:3::1
GigabitEthernet0/1      [administratively down/down]
unassigned
Serial0/0/0             [administratively down/down]
unassigned
Serial0/0/1             [up/up]
FE80::3
2001:DB8:1:A002::2
Vlan1                   [administratively down/down]
unassigned
R3#
```

(b) IPv6 Interface brief

```
R3#show ipv6 route
IPv6 Routing Table - 6 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route, M - MIPv6
       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
       D - EIGRP, EX - EIGRP external
S ::/0 [1/0]
    via 2001:DB8:1:A002::1
C 2001:DB8:1:3::/64 [0/0]
    via GigabitEthernet0/0, directly connected
L 2001:DB8:1:3::1/128 [0/0]
    via GigabitEthernet0/0, receive
C 2001:DB8:1:A002::/64 [0/0]
    via Serial0/0/1, directly connected
L 2001:DB8:1:A002::2/128 [0/0]
    via Serial0/0/1, receive
L FE80::/8 [0/0]
    via Null0, receive
R3#
```

(c) show ipv6 route

Figure 4: Verifying the Network

1

PC command

From the command prompt in the PC terminals, I entered the command `ipv6 config` for information on the network See Fig 4a

2

routing address

From the routers terminals

I entered `show ipv6 interface brief` to display the configured addresses. See Fig 4b

3

Routing Table

Finally, I entered `Show ipv6 route` into each of the prompts to display the routing tables. See Fig 4c

Part 3: Success

Congratulations chaz! You completed the activity.

Overall Feedback [Assessment Items](#) Connectivity Tests

[Expand/Collapse All](#) [Show Incorrect Items](#)

| Assessment Items | Status | Points | Component(s) | Feedback |
|------------------|---------|--------|--------------------|----------|
| Network | | | | |
| R1 | | | | |
| Routesv6 | | | | |
| Static Routes | | | | |
| Route0 | Correct | 10 | Static IPv6 Rou... | |
| Route1 | Correct | 10 | Static IPv6 Rou... | |
| Route2 | Correct | 10 | Static IPv6 Rou... | |
| R2 | | | | |
| Routesv6 | | | | |
| Static Routes | | | | |
| Route0 | Correct | 10 | Static IPv6 Rou... | |
| Route1 | Correct | 10 | Static IPv6 Rou... | |
| R3 | | | | |
| Routesv6 | | | | |
| Static Routes | | | | |
| Route0 | Correct | 10 | Static IPv6 Rou... | |

Score 60/60
Item Count 6/6

| Component | Items/Total | Score |
|---------------------------------|-------------|-------|
| Static IPv6 Route Configuration | 6/6 | 60/60 |