IPv6

IPv6 Unicast (and Anycast) Addresses

- IPv6 has same address format for global unicast and for anycast:
  - Uses a global routing prefix—a structure that enables aggregation upward, eventually to the ISP.
  - A single interface may be assigned multiple addresses of any type (unicast, anycast, multicast).
  - Every IPv6-enabled interface must contain at least one loopback (::1/128) and one link-local address.
  - Optionally, every interface can have multiple unique local and global addresses.
  - Anycast address is a global unicast address assigned to a set of interfaces (typically on different nodes).
  - IPv6 anycast is used for a network multihomed to several ISPs that have multiple connections to each other.

IPv6 Unicast Addressing

- IPv6 addressing rules are covered by multiple RFCs.
  - Architecture defined by RFC 4291.
- Unicast: One-to-one
  - Global
  - Link local (FE80::/10)
  - Site Local (FEC0::/10)
- A single interface may be assigned multiple IPv6 addresses of any type: unicast, anycast, or multicast.
<table>
<thead>
<tr>
<th>IPv6 Prefix</th>
<th>Allocation</th>
<th>Reference</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000::/8</td>
<td>Reserved by IETF</td>
<td>[RFC4291]</td>
<td>[1] [5]</td>
</tr>
<tr>
<td>0100::/8</td>
<td>Reserved by IETF</td>
<td>[RFC4291]</td>
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</tr>
<tr>
<td>0200::/7</td>
<td>Reserved by IETF</td>
<td>[RFC4048]</td>
<td>[2]</td>
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<tr>
<td>0400::/6</td>
<td>Reserved by IETF</td>
<td>[RFC4291]</td>
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<td>0800::/5</td>
<td>Reserved by IETF</td>
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<tr>
<td>1000::/4</td>
<td>Reserved by IETF</td>
<td>[RFC4291]</td>
<td></td>
</tr>
<tr>
<td>2000::/3</td>
<td>Global Unicast</td>
<td>[RFC4291]</td>
<td>[3]</td>
</tr>
<tr>
<td>4000::/3</td>
<td>Reserved by IETF</td>
<td>[RFC4291]</td>
<td></td>
</tr>
<tr>
<td>6000::/3</td>
<td>Reserved by IETF</td>
<td>[RFC4291]</td>
<td></td>
</tr>
<tr>
<td>8000::/3</td>
<td>Reserved by IETF</td>
<td>[RFC4291]</td>
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</tr>
<tr>
<td>A000::/3</td>
<td>Reserved by IETF</td>
<td>[RFC4291]</td>
<td></td>
</tr>
<tr>
<td>C000::/3</td>
<td>Reserved by IETF</td>
<td>[RFC4291]</td>
<td></td>
</tr>
<tr>
<td>E000::/4</td>
<td>Reserved by IETF</td>
<td>[RFC4291]</td>
<td></td>
</tr>
<tr>
<td>F000::/5</td>
<td>Reserved by IETF</td>
<td>[RFC4291]</td>
<td></td>
</tr>
<tr>
<td>F800::/6</td>
<td>Reserved by IETF</td>
<td>[RFC4291]</td>
<td></td>
</tr>
<tr>
<td>FC00::/7</td>
<td>Unique Local Unicast</td>
<td>[RFC4193]</td>
<td></td>
</tr>
<tr>
<td>FE00::/9</td>
<td>Reserved by IETF</td>
<td>[RFC4291]</td>
<td></td>
</tr>
<tr>
<td>FE80::/10</td>
<td>Link Local Unicast</td>
<td>[RFC4291]</td>
<td></td>
</tr>
<tr>
<td>FEC0::/10</td>
<td>Reserved by IETF</td>
<td>[RFC3879]</td>
<td>[4]</td>
</tr>
<tr>
<td>FF00::/8</td>
<td>Multicast</td>
<td>[RFC4291]</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

[0] The IPv6 address management function was formally delegated to IANA in December 1995 [RFC1881].

[1] The "unspecified address", the "loopback address", and the IPv6 Addresses with Embedded IPv4 Addresses are assigned out of the 0000::/8 address block.

[2] 0200::/7 was previously defined as an OSI NSAP-mapped prefix set [RFC4548]. This definition has been deprecated as of December 2004 [RFC4048].

[3] The IPv6 Unicast space encompasses the entire IPv6 address range with the exception of FF00::/8. [RFC4291] IANA unicast address assignments are currently limited to the IPv6 unicast address range of 2000::/3. IANA assignments from this block are registered in the IANA registry: iana-ipv6-unicast-address-assignments.

[4] FEC0::/10 was previously defined as a Site-Local scoped address prefix. This definition has been deprecated as of September 2004 [RFC3879].

[5] 0000::/96 was previously defined as the "IPv4-compatible IPv6 address" prefix. This definition has been deprecated by [RFC4291].

References
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[RFC4548]  E. Gray, J. Rutemiller and G. Swallow, "Internet Code Point Assignments for NSAP Addresses", RFC XXXX, Month Year.

IPV6 GLOBAL UNICAST ADDRESS ASSIGNMENTS [0]

[last updated 2006-12-22]

<table>
<thead>
<tr>
<th>Global Unicast Prefix</th>
<th>Assignment</th>
<th>Date</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001:0000::/23</td>
<td>IANA</td>
<td>01 Jul 99</td>
<td>[1]</td>
</tr>
<tr>
<td>2001:0200::/23</td>
<td>APNIC</td>
<td>01 Jul 99</td>
<td></td>
</tr>
<tr>
<td>2001:0400::/23</td>
<td>ARIN</td>
<td>01 Jul 99</td>
<td></td>
</tr>
<tr>
<td>2001:0600::/23</td>
<td>RIPE NCC</td>
<td>01 Jul 99</td>
<td></td>
</tr>
<tr>
<td>2001:0800::/23</td>
<td>RIPE NCC</td>
<td>01 May 02</td>
<td></td>
</tr>
<tr>
<td>2001:0A00::/23</td>
<td>RIPE NCC</td>
<td>02 Nov 02</td>
<td></td>
</tr>
<tr>
<td>2001:0C00::/23</td>
<td>APNIC</td>
<td>01 May 02</td>
<td>[2]</td>
</tr>
<tr>
<td>2001:0E00::/23</td>
<td>APNIC</td>
<td>01 Jan 03</td>
<td></td>
</tr>
<tr>
<td>2001:1200::/23</td>
<td>LACNIC</td>
<td>01 Nov 02</td>
<td></td>
</tr>
<tr>
<td>2001:1400::/23</td>
<td>RIPE NCC</td>
<td>01 Feb 03</td>
<td></td>
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<tr>
<td>2001:1600::/23</td>
<td>RIPE NCC</td>
<td>01 Jul 03</td>
<td></td>
</tr>
<tr>
<td>2001:1800::/23</td>
<td>ARIN</td>
<td>01 Apr 03</td>
<td></td>
</tr>
<tr>
<td>2001:1A00::/23</td>
<td>RIPE NCC</td>
<td>01 Jan 04</td>
<td></td>
</tr>
<tr>
<td>2001:1C00::/22</td>
<td>RIPE NCC</td>
<td>01 May 04</td>
<td></td>
</tr>
<tr>
<td>2001:2000::/20</td>
<td>RIPE NCC</td>
<td>01 May 04</td>
<td></td>
</tr>
<tr>
<td>2001:3000::/21</td>
<td>RIPE NCC</td>
<td>01 May 04</td>
<td></td>
</tr>
<tr>
<td>2001:3800::/22</td>
<td>RIPE NCC</td>
<td>01 May 04</td>
<td></td>
</tr>
<tr>
<td>2001:3C00::/22</td>
<td>RESERVED</td>
<td>11 Jun 04</td>
<td>[3]</td>
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<td>2001:4000::/23</td>
<td>RIPE NCC</td>
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</tr>
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<td>2001:4200::/23</td>
<td>AfriNIC</td>
<td>01 Jun 04</td>
<td></td>
</tr>
<tr>
<td>2001:4400::/23</td>
<td>APNIC</td>
<td>11 Jun 04</td>
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<tr>
<td>2001:4600::/23</td>
<td>RIPE NCC</td>
<td>17 Aug 04</td>
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<td>2001:4800::/23</td>
<td>ARIN</td>
<td>24 Aug 04</td>
<td></td>
</tr>
<tr>
<td>2001:4A00::/23</td>
<td>RIPE NCC</td>
<td>15 Oct 04</td>
<td></td>
</tr>
<tr>
<td>2001:4C00::/23</td>
<td>RIPE NCC</td>
<td>17 Dec 04</td>
<td></td>
</tr>
<tr>
<td>2001:5000::/20</td>
<td>RIPE NCC</td>
<td>10 Sep 04</td>
<td></td>
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<td>2001:8000::/19</td>
<td>APNIC</td>
<td>30 Nov 04</td>
<td></td>
</tr>
<tr>
<td>2001:A000::/20</td>
<td>APNIC</td>
<td>30 Nov 04</td>
<td></td>
</tr>
<tr>
<td>2001:B000::/20</td>
<td>APNIC</td>
<td>08 Mar 06</td>
<td></td>
</tr>
<tr>
<td>2002:0000::/16</td>
<td>6to4</td>
<td>01 Feb 01</td>
<td>[4]</td>
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<tr>
<td>2003:0000::/18</td>
<td>RIPE NCC</td>
<td>12 Jan 05</td>
<td></td>
</tr>
<tr>
<td>2400:0000::/12</td>
<td>APNIC</td>
<td>03 Oct 06</td>
<td>[8]</td>
</tr>
<tr>
<td>2600:0000::/12</td>
<td>ARIN</td>
<td>03 Oct 06</td>
<td>[9]</td>
</tr>
</tbody>
</table>
IPv6

Notes:

[0] The assignable Global Unicast Address space is defined in [RFC3513] as being the address block defined by the prefix 2000::/3. All address space in this block not listed in the table above is reserved by IANA for future allocation.


[2] 2001:0DB8::/32 has been assigned as a NON-ROUTABLE range to be used for documentation purpose [RFC3849].

[3] 2001:3C00::/22 is reserved for possible future allocation to the RIPE NCC.


[5] 2A00:0000::/21 was originally allocated on 19 Apr 05. 2A01:0000::/23 was allocated on 14 Jul 05. 2A01:0000::/16 (incorporating the 2A01:0000::/23) was allocated 15 Dec 2005. The more recent allocation (03 Oct 2006) incorporates these previous allocations.

[7] 2800:0000::/23 was allocated on 17 Nov 05. The more recent allocation (03 Oct 06) incorporates the previous allocation.

[8] 2400:0000::/19 was allocated on 20 May 05. 2400:2000::/19 was allocated on 08 Jul 05. 2400:4000::/21 was allocated on 08 Aug 05. 2404:0000::/23 was allocated on 19 Jan 06. The more recent allocation (03 October 06) incorporates all these previous allocations.

[9] 2600:0000::/22, 2604:0000::/22, 2608:0000::/22 and 260C:0000::/22 were allocated on 19 Apr 05. The more recent allocation (03 Oct 06) incorporates all these previous allocations.

References
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Permanent Multicast Addresses

| FF02::1     | All nodes | Link-local |
| FF02::2     | All routers | Link-local |
| FF02::9     | All RIP routers | Link-local |
| FF02::1:FFXX:XXXX | Solicited-node | Link-local |
| FF05::101   | All NTP Servers | Site-local |

IPv6

RIPvng

```
ipv6 unicast-routing
!
interface Ethernet0/1
  no ip address
  half-duplex
  ipv6 address 2005:0:104::1/64
  ipv6 address FE80::1 link-local
  ipv6 rip RIPv enable
!
interface Serial0/1
  no ip address
  ipv6 address 2005:0:102::1/64
  ipv6 address FE80::1 link-local
  ipv6 rip RIPv enable
  clock rate 64000
!
ipv6 router rip RIPv enable
```
Configuration Modes in OSPFv3

- Entering router mode
  - [no] ipv6 router ospf <process ID>
- Entering interface mode
  - [no] ipv6 ospf <process ID> area <area ID>
- Exec mode
  - [no] show ipv6 ospf [<process ID>]
  - clear ipv6 ospf [<process ID>]

Cisco IOS OSPFv3 Specific Attributes

- Configuring area range
  - [no] area <area ID> range <prefix>/<prefix length>
- Showing new LSA
  - show ipv6 ospf [<process ID>] database link
  - show ipv6 ospf [<process ID>] database prefix
OSPFv3 Debug Commands

- Adjacency is not appearing
  - [no] debug ipv6 ospf adj
  - [no] debug ipv6 ospf hello
- SPF is running constantly
  - [no] debug ipv6 ospf spf
  - [no] debug ipv6 ospf flooding
  - [no] debug ipv6 ospf events
  - [no] debug ipv6 ospf lsas-generation
  - [no] debug ipv6 ospf database-timer
- General purpose
  - [no] debug ipv6 ospf packets
  - [no] debug ipv6 ospf retransmission
  - [no] debug ipv6 ospf tree

"show ipv6 ospf rib"
"show ipv6 ospf rib"

This hidden command shows the OSPFv3 local RIB. OSPFv3 adds entries to the local RIB during SPF, then updates the IPv6 master RIB from the "best" routes in the local RIB. Can be useful to see all the routes OSPFv3 is holding.
**OSPFv3 configuration example**

```
Router1# interface Ethernet0
    ipv6 address 2001:1:1:1::1/64
    ipv6 ospf 1 area 0

interface Ethernet1
    ipv6 address 2001:2:2:2::2/64
    ipv6 ospf 1 area 1

ipv6 router ospf 1
    router-id 1.1.1.1
    area 1 range 2001:2:2::/48
```

---

**Cisco IOS OSPFv3 Display**

```
Router 2# show ipv6 route ospf
IPv6 Routing Table - 9 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
    O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext1, OE2 - OSPF ext2
    via FE80::205:FFF:FEAF:2C38, Ethernet0
OI 2001:2:2:48 [110/2]
    via FE80::205:FFF:FEAF:2C38, Ethernet0
```
MBGP – IPv6

```
R2#sh run | b bgp
router bgp 100
  no synchronization
  bgp router-id 2.2.2.2
  bgp log-neighbor-changes
  neighbor 2000:3:3:: remote-as 100
  neighbor 2000:3:3:: update-source Serial1/1
  no neighbor 2000:3:3:: activate
  neighbor 2005:0:102::1 remote-as 200
  no neighbor 2005:0:102::1 activate
  no auto-summary

! address-family ipv6
  neighbor 2000:3:3:: activate
  neighbor 2005:0:102::1 activate
  network 2006:2:2::/128
  exit-address-family
```

Configuring Prefix-Lists (Cont.)

What will be matched by:

- ipv6 prefix-list A permit ::/0 ge 128
- ipv6 prefix-list B permit FEC0::/10 ge 11
- ipv6 prefix-list C permit ::/0 le 128
- ipv6 prefix-list D permit ::/0
- ipv6 prefix-list E permit x:xx:xxxx:xxxx:xxxx::/64
  - a) All host routes
  - b) Any site local address space
  - c) All routes
  - d) Just the default route
  - e) A specific prefix with a length of 64 bits
### Tunnel Configuration

**IPv6 Tunnel Configuration**

```
interface Tunnel0
  no ip address
  ipv6 address 2001:0001::45A/64
  tunnel source 192.0.0.1
  tunnel destination 192.0.30.1
  tunnel mode ipv6ip

ipv6 router ospf 1
  area 0

```

**IPv6 Tunnel Configuration**

```
interface Tunnel0
  no ip address
  ipv6 address 2001:0001::45C/64
  tunnel source 192.0.0.1
  tunnel destination 192.0.30.1
  tunnel mode ipv6ip

ipv6 router ospf 1
  area 0
```

### OSPFv3 on IPv6 Tunnels over IPv4

**OSPFv3 on IPv6 Tunnels over IPv4 Configuration**

```
interface Tunnel0
  no ip address
  ipv6 address FE80::10:7BC2:ACC9:10 link-local
  ipv6 router ospf 1 area 0
  tunnel source Ethernet1
  tunnel destination 10.42.2.1
  tunnel mode ipv6ip

ipv6 router ospf 1
```

```
interface Tunnel0
  no ip address
  ipv6 address FE80::10:7BC2:B280:11 link-local
  ipv6 router ospf 1 area 0
  tunnel source Ethernet2
  tunnel destination 10.42.1.1
  tunnel mode ipv6ip

ipv6 router ospf 1
```

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IPv4-Compatible Tunnel

- With an IPv4-compatible tunnel, the tunnel destination is automatically determined by the IPv4 address in the low-order 32 bits of IPv4-compatible IPv6 addresses. The host or router at each end of an IPv4-compatible tunnel must support both the IPv4 and IPv6 protocol stacks.

```
interface tunnel 0
tunnel source Ethernet 0
tunnel mode ipv6ip auto-tunnel

interface ethernet 0
ip address 10.27.0.1 255.255.255.0
ipv6 address 3000:2222::1/64

router bgp 65000
no synchronization
no bgp default ipv4-unicast
neighbor ::10.67.0.2 remote-as 65002
address-family ipv6
neighbor ::10.67.0.2 activate
neighbor ::10.67.0.2 next-hop-self
network 2001:2222::d00d:b10c::/64
```

ISTAP Tunnel

- The ISATAP tunnels are typically used to tunnel between routers and dual stack hosts that are connected via an IPv4 network. The tunnel’s IPv6 address must use a modified EUI-64 address because the last 32 bits will be constructed using the IPv4 address of the tunnel source. By default routing updates are suppressed, this needs to be re-enabled for the host to use autoconfigure for their addressing.

```
interface tunnel 1
tunnel source ethernet 0
tunnel mode ipv6ip isatap
ipv6 address 2001:0DB8::/64 eui-64

no ipv6 nd suppress-ra
```
6-to-4 Tunneling

- 6-to-4:
  - Is an automatic tunnel method
  - Gives a prefix to the attached IPv6 network

6to4 Tunnel Configuration

```bash
R1# interface FastEthernet0/0
   ip address 180.40.7.66 255.255.255.224
!
interface Tunnel0
   no ip address
   no ip redirects
   ipv6 address 2002:B428:742::/64
   tunnel source FastEthernet0/0
   tunnel mode ipv6ip 6to4
!
ipv6 route 2002::/16 Tunnel0

R7#sh run
interface FastEthernet0/1
   ip address 180.40.7.1 255.255.255.224
!
interface Tunnel0
   no ip address
   no ip redirects
   ipv6 address 2002:B428:701::/64
   tunnel source FastEthernet0/1
   tunnel mode ipv6ip 6to4
!
ipv6 route 2002::/16 Tunnel0
```
IPv6 Tunnel with BGP

RI#
interface FastEthernet0/0
ip address 180.40.7.66 255.255.255.224
!
interface Tunnel0
  no ip address
  no ip redirects
  ipv6 address 2002:BA28:742::/64
  tunnel source FastEthernet0/0
  tunnel mode ipv6ip 6to4
!
ipv6 route 2002::/64 Tunnel0

router bgp 100
  neighbor 2002:BA28:701:: remote-as 200
  neighbor 2002:BA28:701 :: ebgp-multihop 2
You must identify the interfaces involved using the `ipv6 nat` command, note that there is no direction. You have to determine if you want to have a dynamic pool for IPv4 or IPv6, you can’t have dynamic nat for both, one must be a static configuration. In this example, there is a static translation for an IPv6 address to an IPv4 address. There rest is to support a dynamic pool for IPv4 to IPv6. You have to identify a prefix that is going to be used for the nat process, note that it has to be a /96 even though the help shows a range of 0-128. The prefix will show up in the IPv6 RIB as a connected route. To get the IPv6 prefix advertised to the other IPv6 routers, redistribute connected into which ever routing protocol you are using. For the IPv4 prefix, you’ll need to either add an address to a loopback interface or create a static route to null 0. Then pass that into the routing protocol for IPv4. The concept for the pools is standard nat.
R1

interface Loopback2
    description To inject into OSPF for R5
    ip address 199.199.199.1 255.255.255.0

interface FastEthernet0/0
    ipv6 nat

interface Serial0/0.1 multipoint
    ipv6 nat ! note that there’s no direction

interface Virtual-Template1
    ipv6 nat ! same command on the IPv4 interface

router eigrp 174
    network 199.199.199.1 0.0.0.0

ipv6 router ospf 1
    distribute-list prefix-list NATPT out connected
    redistribute connected

ipv6 nat v4v6 source 172.22.52.5 2006:5:5::5 ! the static translation
ipv6 nat v6v4 source list NATPT pool MyPool ! mapping to the pool
ipv6 nat v6v4 pool MyPool 199.199.199.2 199.199.199.100 prefix-length 24
ipv6 nat prefix 2006:5:5::/96 ! a must even if you’re only going to use 1 address
    and it has to be a 96 length

ipv6 prefix-list NATPT seq 5 permit 2006:5:5::/96

ipv6 access-list NATPT
    permit ipv6 any any
show ipv6 nat translation

ping or telnet from a IPv6 router to 2006:5:5::5

<table>
<thead>
<tr>
<th>Prot</th>
<th>IPv4 source</th>
<th>IPv6 source</th>
</tr>
</thead>
<tbody>
<tr>
<td>172.22.52.5</td>
<td>2006:5:5::5</td>
<td></td>
</tr>
<tr>
<td>199.199.199.2</td>
<td>2005:26:26::6</td>
<td></td>
</tr>
<tr>
<td>172.22.52.5</td>
<td>2006:5:5::5</td>
<td></td>
</tr>
<tr>
<td>199.199.199.2</td>
<td>2005:26:26::6</td>
<td></td>
</tr>
</tbody>
</table>

R1#show ipv6 nat statistics

Total active translations: 3 (1 static, 2 dynamic; 0 extended)
NAT-PT interfaces:
FastEthernet0/0, Serial0/0.1, NVI0, Virtual-Access1, Virtual-Template1
Hits: 0  Misses: 0
Expired translations: 0

R5#show ipv6 int brief

<table>
<thead>
<tr>
<th>Interface</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>FastEthernet0/0</td>
<td>[administratively down/down]</td>
</tr>
<tr>
<td>FastEthernet0/1</td>
<td>[up/up]</td>
</tr>
<tr>
<td>FastEthernet0/1.52</td>
<td>[up/up]</td>
</tr>
<tr>
<td>FastEthernet1/0</td>
<td>[administratively down/down]</td>
</tr>
<tr>
<td>Serial1/0</td>
<td>[up/up]</td>
</tr>
<tr>
<td>FastEthernet1/1</td>
<td>[administratively down/down]</td>
</tr>
<tr>
<td>Serial1/1</td>
<td>[administratively down/down]</td>
</tr>
<tr>
<td>Serial1/2</td>
<td>[administratively down/down]</td>
</tr>
<tr>
<td>Serial1/3</td>
<td>[administratively down/down]</td>
</tr>
<tr>
<td>Virtual-Access1</td>
<td>[up/up]</td>
</tr>
<tr>
<td>Virtual-Template1</td>
<td>[down/down]</td>
</tr>
</tbody>
</table>
Virtual-Access2 [down/down]
Loopback0 [up/up]
Loopback1 [up/up]

R5#show ip route 199.199.199.0
Routing entry for 199.199.199.0/24
   Known via "eigrp 174", distance 90, metric 42688000, type internal
   Redistributing via eigrp 174
   Last update from 172.22.51.1 on Virtual-Access1, 00:33:54 ago
   Routing Descriptor Blocks:
      * 172.22.51.1, from 172.22.51.1, 00:33:54 ago, via Virtual-Access1
         Route metric is 42688000, traffic share count is 1
         Total delay is 105000 microseconds, minimum bandwidth is 64 Kbit
         Reliability 255/255, minimum MTU 1500 bytes
         Loading 1/255, Hops 1

R6#show ipv6 route 2006:5:5::5
IPv6 Routing Table - 15 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
       R  2006:5:5::/96 [120/3]
           via FE80::2, Tunnel0

R1#debug ipv6 nat
IPv6 NAT-PT debugging is on

R6#ping 2006:5:5::5
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2006:5:5::5, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 72/73/76 ms

R1#
(2006:5:5::5) -> (172.22.52.5)
09:21:59: IPv6 NAT: icmp src (172.22.52.5) -> (2006:5:5::5), dst
(199.199.199.2) -> (2005:26:26::6)
09:22:00: IPv6 NAT: icmp src (2005:26:26::6) -> (199.199.199.2), dst
(2006:5:5::5) -> (172.22.52.5)
09:22:00: IPv6 NAT: icmp src (172.22.52.5) -> (2006:5:5::5), dst
(199.199.199.2) -> (2005:26:26::6)
09:22:00: IPv6 NAT: icmp src (2005:26:26::6) -> (199.199.199.2), dst
(2006:5:5::5) -> (172.22.52.5)
09:22:00: IPv6 NAT: icmp src (172.22.52.5) -> (2006:5:5::5), dst
(199.199.199.2) -> (2005:26:26::6)
09:22:00: IPv6 NAT: icmp src (2005:26:26::6) -> (199.199.199.2), dst
(2006:5:5::5) -> (172.22.52.5)
09:22:00: IPv6 NAT: icmp src (172.22.52.5) -> (2006:5:5::5), dst
(199.199.199.2) -> (2005:26:26::6)

-------------------------------------------------------------------------
R6#telnet 2006:5:5::5
Trying 2006:5:5::5 ... Open

User Access Verification
Password:
R5>