通过IPv4网络的IPv6隧道

Contents

Introduction

本文档提供的配置示例通过事先存在的 IPv4 网络建立 IPv6 Routing Information Protocol (RIP) 和 IPv6 边界网关协议 (BGP) 网络和数据流隧道。利用该技术可通过现有的 IPv4 主干网连接 IPv6 站点。

重叠隧道封装在IPv4信息包的IPv6信息包在IPv4基础设施间的发运的。这类似于您如何创建一条通用路由封装(GRE)隧道通过IP网络传输网际分组交换(IPX)数据流。在隧道头端， IPv6数据包被封装到IPv4信息包并且被发送到远程隧道目的地。这是剥离的地方IPv4信息包报头，并且原始IPv6数据包转发进一步到IPv6网云。

这些是隧道IPv6流量五个方法：

- 手工的IPv6隧道
- 自动IPv4-compatible隧道
- GRE
- 自动6to4隧道
- 站内自动隧道寻址协议(ISATAP)隧道

主要的区别在这些隧道技术方面是隧道源及目的地确定的方法。在本文中，手工和自动IPv4兼容的隧道类型被描述。关于其他隧道技术和他们的特性的信息，参考实现IPv6的隧道。

Note:重叠隧道由20个八位位组减少接口的最大传输单元(MTU)。这假设，基本的IPv4信息包报头不包含可选字段。使用躺在隧道的网络是难排除故障。所以，连接查出的IPv6网络的躺在的隧道不应

该考虑作为一个最终IPv6网络体系结构。应该考虑使用重叠隧道作为往支持IPv4和IPv6协议栈的网络，或者IPv6协议栈的一过渡技术。

Prerequisites

Requirements

Cisco建议您有IPv6知识，在您尝试此配置前。关于IPv6的信息，参考实现IPv6寻址和基本连通性。

Components Used

本文的信息根据Cisco 36xx系列路由器该运行Cisco IOS软件版本12.3(13)。

Note: 支持Cisco IOS Software Release 12.2(2)T的所有硬件平台或12.0(21)ST和以后也支持IPv6。

The information in this document was created from the devices in a specific lab environment.All of the devices used in this document started with a cleared (default) configuration.If your network is live, make sure that you understand the potential impact of any command.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

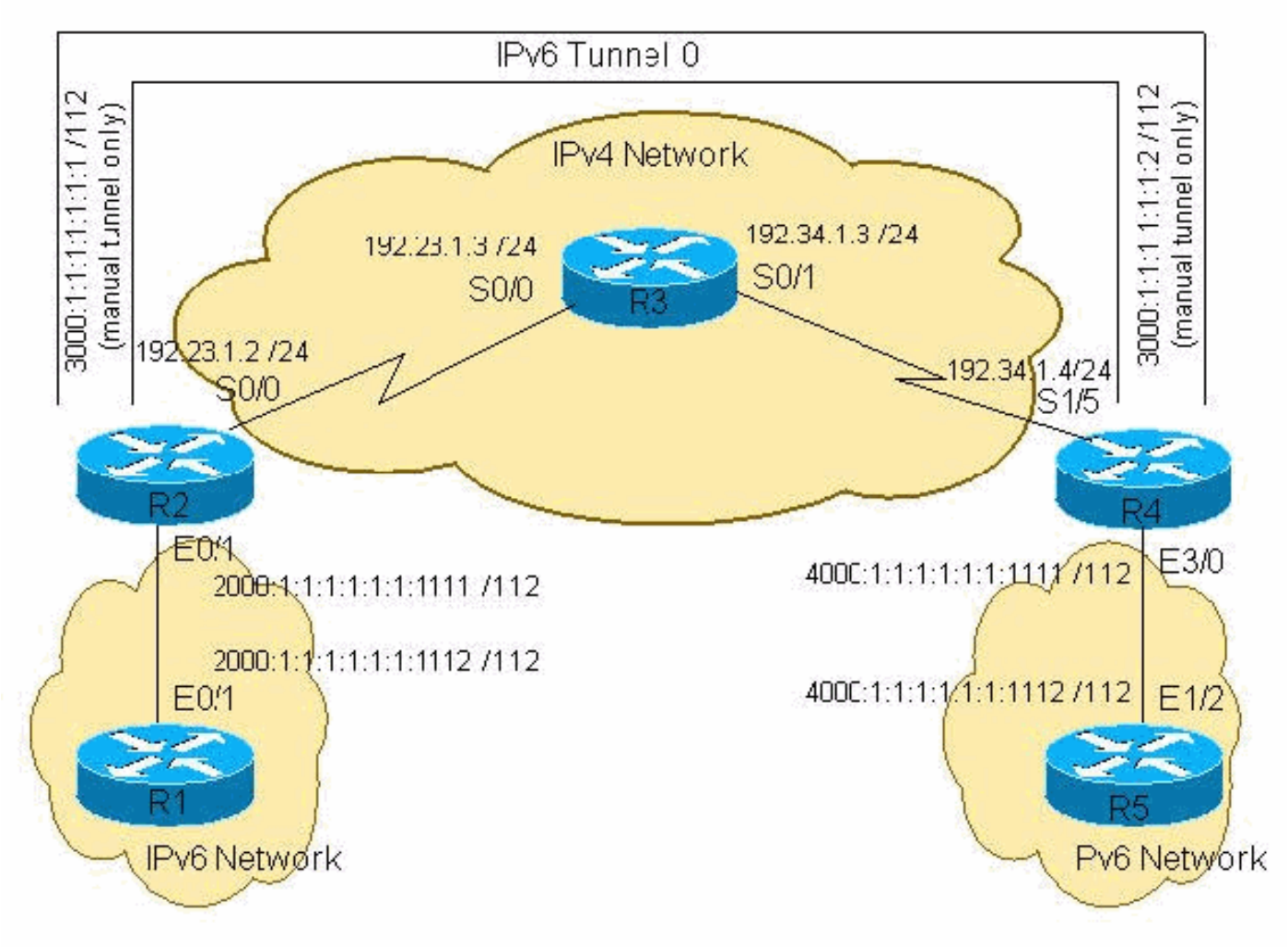
Configure

本部分提供有关如何配置本文档所述功能的信息。

Note: 有关本文档所用命令的详细信息，请使用命令查找工具（仅限注册用户）。

Network Diagram

本文档使用以下网络设置：



配置(手工的IPv6模式)

IPv6的手工配置的隧道的配置是明显的。它要求隧道IPv4来源和隧道IPv4目的地的确定规格。唯一的缺点，当您使用此技术时是您必须进行的相当数量管理，当隧道的数量增长时。

本文使用这些配置手工的IPv6模式：

- R1-IPv6
- R2-IPv6-IPv4
- R3-IPv4
- R4-IPv4-IPv6
- R5-IPv6

R1-IPv6 (Cisco 3640 Router)

```
R1-ipv6#show run
Building configuration...

Current configuration : 916 bytes
!
version 12.3
hostname R1-ipv6
!
boot system flash
logging buffered 4096 debugging
!
```

```
ip subnet-zero
ip cef
!
!
no ip domain-lookup
!
ipv6 unicast-routing
!
!
!
!
interface Ethernet0/0
 no ip address
 shutdown
!
interface Ethernet0/1
 no ip address
 ipv6 address 2000:1:1:1:1:1:1:1112/112
 ipv6 rip 6bone enable
!
!
ip classless
!
ipv6 router rip 6bone
!
line con 0
 exec-timeout 0 0
line aux 0
line vty 0 4
 login
!
!
!
end
```

R2-IPv6-IPv4 (Cisco 3640 Router)

```
R2-ipv6-ipv4#show run
Building configuration...

Current configuration : 1079 bytes
!
version 12.3
!
hostname R2-ipv6-ipv4
!
ip subnet-zero
!
!
ipv6 unicast-routing
!
!
interface Tunnel0
 no ip address
 ipv6 address 3000::1/112
 ipv6 rip 6bone enable
 tunnel source Serial0/0
tunnel destination 192.34.1.4
tunnel mode ipv6ip
!--- Configures Manual tunnel. !--- In some cases, user
would require a Data License !--- in order to issue
"tunnel mode ipv6ip" ! ! interface Serial0/0 ip address
192.23.1.2 255.255.255.0 clockrate 64000 ! interface
```

```
FastEthernet0/1 no ip address duplex auto speed auto
ipv6 address 2000:1:1:1:1:1:1111/112 ipv6 rip 6bone
enable ! router ospf 1 log-adjacency-changes network
192.23.1.0 0.0.0.255 area 0 ! ip classless ! ipv6 router
rip 6bone ! ! line con 0 line aux 0 line vty 0 4 login
line vty 5 15 login ! ! end
```

R3-IPv4 (Cisco 2621 Router)

```
R3-ipv4#show run
Building configuration...

Current configuration : 865 bytes
!
version 12.3
!
hostname R3-ipv4
!
!
memory-size iomem 15
ip subnet-zero
!
!
interface Serial0/0
 ip address 192.23.1.3 255.255.255.0
!
interface Serial0/1
 ip address 192.34.1.3 255.255.255.0
!
router ospf 1
 log-adjacency-changes
 network 192.23.1.0 0.0.0.255 area 0
 network 192.34.1.0 0.0.0.255 area 0
!
ip classless
!
line con 0
line aux 0
line vty 0 4
!
!
end
```

R4-IPv4-IPv6 (Cisco 3640 Router)

```
R4-ipv4-ipv6#show run
Building configuration...

Current configuration : 1413 bytes
!
version 12.3
!
hostname R4-ipv4-ipv6
!
!
ip subnet-zero
!
!
no ip domain-lookup
!
ipv6 unicast-routing
!
!
```

```
!
interface Tunnel0
 no ip address
 ipv6 address 3000::2/112
 ipv6 rip 6bone enable
 tunnel source Serial1/5
tunnel destination 192.23.1.2
tunnel mode ipv6ip
!--- Configures Manual tunnel. ! ! interface Serial1/5
ip address 192.34.1.4 255.255.255.0 clockrate 64000 ! !
interface Ethernet3/0 no ip address half-duplex ipv6
address 4000:1:1:1:1:1:1:1111/112 ipv6 rip 6bone enable
! router ospf 1 log-adjacency-changes network 192.34.1.0
0.0.0.255 area 0 ! ip classless ! ipv6 router rip 6bone
! ! line con 0 line aux 0 line vty 0 4 login ! ! end
```

R5-IPv6 (Cisco 7500 Router)

```
R5-ipv6#show run
Building configuration...

Current configuration : 1001 bytes
!
version 12.3
!
hostname R5-ipv6
!
ip subnet-zero
ip cef distributed
!
!
no ip domain-lookup
!
ipv6 unicast-routing
!
!
!
interface Ethernet1/2
 no ip address
 ipv6 address 4000:1:1:1:1:1:1:1112/112
 ipv6 rip 6bone enable
!
!
ip classless
!
ipv6 router rip 6bone
!
!
!
line con 0
 exec-timeout 0 0
line aux 0
line vty 0 4
 login
!
!
end
```

配置(自动IPv4-compatible模式)

R1、R3和R5的配置是相同的象手工的IPv6模式示例。仅R2和R4配置更改。当您配置IPv4-compatible隧道时，请勿明确地指定隧道目的地IPv4地址。隧道目的地从Ipv6 route的IPv6下一跳地

址自动地被计算。为了提供在这样隧道的路由，明确相邻地址定义，例如BGP或静态，需要路由协议。在这种情况下，您需要使用IPv4兼容的IPv6地址作为BGP邻居IPv6地址或静态路由下一跳地址。

这些示例使用在R2和R4的serial interfaces作为IPv4-compatible IPv6地址。同一个序列是隧道源。例如，在R2 S0/0的IPv4地址192.23.1.2被转换对： ：在IPv6符号的192.23.1.2。此地址使用作为BGP对等体IPv6地址和BGP下个跳跃。终究IPv6 BGP路由再分布到Ipv6 rip，以便网络的远程终端获得信息。

此隧道技术当前贬抑。Cisco建议您使用IPv6 ISATAP隧道技术。参考ISATAP隧道关于此技术的更多信息。

Note: 没有需要用自动IPv6模式配置隧道目的地。

R2-IPv6-IPv4 (Cisco 3640 Router)

```
R2-ipv6-ipv4#show run
Building configuration...
Current configuration : 1394 bytes
!
version 12.3
!
hostname R2-ipv6-ipv4
!
!
ip subnet-zero
!
!
!
ipv6 unicast-routing
!
!
interface Tunnel0
 no ip address
 no ip redirects
 ipv6 rip 6bone enable
 tunnel source Serial0/0
tunnel mode ipv6ip auto-tunnel
!--- Configures Automatic IPv4 compatible tunnel. ! !
interface Serial0/0 ip address 192.23.1.2 255.255.255.0
clockrate 64000 ! interface FastEthernet0/1 no ip
address duplex auto speed auto ipv6 address
2000:1:1:1:1:1:1:1111/112 ipv6 rip 6bone enable ! !
router ospf 1 log-adjacency-changes network 192.23.1.0
0.0.0.255 area 0 ! router bgp 100 no synchronization no
bgp default ipv4-unicast bgp log-neighbor-changes
neighbor ::192.34.1.4 remote-as 100 no auto-summary !
address-family ipv6 neighbor ::192.34.1.4 activate
neighbor ::192.34.1.4 next-hop-self network
2000:1:1:1:1:1:1:0/112 bgp redistribute-internal
!--- The show run command along with the !---
redistribute bgp command allows BGP to redistribute the
!--- IPv6 routes learned through the tunnel from the
other site.

exit-address-family ! ip classless ! ipv6 router rip
6bone redistribute bgp 100 metric 2
!
!
line con 0
```

```
line aux 0
line vty 0 4
 login
line vty 5 15
 login
!
!
end
```

R4-IPv4-IPv6 (Cisco 3640 Router)

```
R4-ipv4-ipv6#show run
Building configuration...

Current configuration : 1697 bytes
!
version 12.3
!
hostname R4-ipv4-ipv6
!
ip subnet-zero
!
!
no ip domain-lookup
!
ipv6 unicast-routing
!
!
!
interface Tunnel0
 no ip address
 no ip redirects
 ipv6 rip 6bone enable
 tunnel source Serial1/5
tunnel mode ipv6ip auto-tunnel
!--- Configures Automatic IPv4 compatible tunnel. ! !
interface Serial1/5 ip address 192.34.1.4 255.255.255.0
clockrate 64000 ! ! interface Ethernet3/0 no ip address
half-duplex ipv6 address 4000:1:1:1:1:1:1:1111/112 ipv6
rip 6bone enable ! router ospf 1 log-adjacency-changes
network 192.34.1.0 0.0.0.255 area 0 ! router bgp 100 no
synchronization no bgp default ipv4-unicast bgp log-
neighbor-changes neighbor ::192.23.1.2 remote-as 100 no
auto-summary ! address-family ipv6 neighbor ::192.23.1.2
activate neighbor ::192.23.1.2 next-hop-self network
4000:1:1:1:1:1:1:0/112 bgp redistribute-internal
!--- The show run command along with the !---
redistribute bgp command allows BGP to redistribute the
!--- IPv6 routes learned through the tunnel from the
other site.


 exit-address-family
!
ip classless
!
ipv6 router rip 6bone
redistribute bgp 100 metric 2
!
!
!
line con 0
line aux 0
```

```
line vty 0 4
 login
!
!
end
```

Verify

本部分所提供的信息可用于确认您的配置是否正常工作。

命令输出解释程序（仅限注册用户）(OIT) 支持某些 **show** 命令。使用 OIT 可查看对 show 命令输出的分析。

- **ping** —确定一台远端主机是否是活跃或非激活的和在沟通的往返延迟与主机。
- **show ipv6 route** —验证路由是否在IPv6存在。
- **show bgp ipv6** —验证BGP是否运行。
- **show bgp ipv6 summary** —显示关于运行在IPv6的BGP的汇总信息。
- **show ipv6 int tunnel 0** —验证隧道是UP在IPv6，并且验证在接口配置的MTU。

手工的IPv6模式的验证命令输出

从R1，请**ping**在R5的IPv6地址验证隧道是否通过IPv4网络传输IPv6。

```
R1-ipv6#ping ipv6 4000:1:1:1:1:1:1:1112
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 4000:1:1:1:1:1:1:1112, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 72/72/72 ms
R1-ipv6#ping 4000:1:1:1:1:1:1:1112
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 4000:1:1:1:1:1:1:1112, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 72/72/72 ms
R1-ipv6#
```

从R5，请**ping**在R1的IPv6地址。

```
R5-ipv6#ping  2000:1:1:1:1:1:1112
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2000:1:1:1:1:1:1112, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/4 ms
R5-ipv6#ping ipv6 2000:1:1:1:1:1:1112
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2000:1:1:1:1:1:1112, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/4 ms
R5-ipv6#
```

自动IPv6模式的验证命令输出

ping远程IPv6网络通过隧道验证连接。

```
R1-ipv6#ping 4000:1:1:1:1:1:1:1112
```

```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 4000:1:1:1:1:1:1:1112, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 68/69/72 ms
R1-ipv6#
R5-ipv6#ping ipv6 2000:1:1:1:1:1:1:1112
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2000:1:1:1:1:1:1:1112, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 68/70/72 ms
R5-ipv6#
```

如果ping发生故障，请查看IPv6路由表验证路由是否存在。检查在另一边的路由表。应该了解在末端路由器的路由，例如R5和R1，作为RIP路由。此路由从BGP再分布到在R2和R4的RIP。R2和R4是隧道终止的地方，并且配置BGP并列。

```
R5-ipv6#show ipv6 route
IPv6 Routing Table - 6 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea
Timers: Uptime/Expires
R   ::/96 [120/2]
     via FE80::230:80FF:FEF3:4731, Ethernet1/2
R   2000:1:1:1:1:1:1:0/112 [120/3]
     via FE80::230:80FF:FEF3:4731, Ethernet1/2
L   4000:1:1:1:1:1:1:1112/128 [0/0]
     via ::, Ethernet1/2
C   4000:1:1:1:1:1:1:0/112 [0/0]
     via ::, Ethernet1/2
L   FE80::/10 [0/0]
     via ::, Null0
L   FF00::/8 [0/0]
     via ::, Null0
R5-ipv6#
```

如果远程IPv6网络不在末端路由器，请检查隧道终止的路由器。

```
R4-ipv4-ipv6#show ipv6 route
IPv6 Routing Table - 7 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea
Timers: Uptime/Expires
L   ::192.34.1.4/128 [0/0]
     via ::, Tunnel0
C   ::/96 [0/0]
     via ::, Tunnel0
B   2000:1:1:1:1:1:1:0/112 [200/0]
     via ::192.23.1.2, Null
L   4000:1:1:1:1:1:1:1111/128 [0/0]
     via ::, Ethernet3/0
C   4000:1:1:1:1:1:1:0/112 [0/0]
     via ::, Ethernet3/0
L   FE80::/10 [0/0]
     via ::, Null0
L   FF00::/8 [0/0]
     via ::, Null0
R4-ipv4-ipv6#
```

由于您使用IPv6 BGP共享两区别IPv6网络之间的信息，请验证BGP是正在运行的。

```
R4-ipv4-ipv6#show bgp ipv6
```

```
BGP table version is 3, local router ID is 192.34.1.4
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure
Origin codes: i - IGP, e - EGP, ? - incomplete
   Network          Next Hop            Metric LocPrf Weight Path
*>i2000:1:1:1:1:1:1:0/112
                    ::192.23.1.2                 100      0 i
*> 4000:1:1:1:1:1:1:0/112
                    ::                                32768 i
R4-ipv4-ipv6#show bgp ipv6 summary
BGP router identifier 192.34.1.4, local AS number 100
BGP table version is 3, main routing table version 3
2 network entries and 2 paths using 394 bytes of memory
2 BGP path attribute entries using 120 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP activity 2/8 prefixes, 2/0 paths, scan interval 60 secs
Neighbor        V    AS MsgRcvd MsgSent   TblVer  InQ OutQ Up/Down  State/PfxRcd
::192.23.1.2    4   100      24      24        3    0    0 00:19:00        1
R4-ipv4-ipv6#
R4-ipv4-ipv6#show ipv6 int tunnel 0
Tunnel0 is up, line protocol is up
  IPv6 is enabled, link-local address is FE80::C022:104
  Global unicast address(es):
    ::192.34.1.4, subnet is ::/96
  Joined group address(es):
    FF02::1
    FF02::2
    FF02::9
    FF02::1:FF22:104
  MTU is 1480 bytes
  ICMP error messages limited to one every 100 milliseconds
  ICMP redirects are enabled
  ND DAD is not supported
  ND reachable time is 30000 milliseconds
  Hosts use stateless autoconfig for addresses.
R4-ipv4-ipv6#
```

Troubleshoot

本部分提供的信息可用于对配置进行故障排除。

故障排除命令

命令输出解释程序（仅限注册用户）(OIT) 支持某些 **show** 命令。使用 OIT 可查看对 show 命令输出的分析。

Note: 使用 **debug** 命令之前，请参阅有关 Debug 命令的重要信息。

- **show ipv6 route** —验证路由是否在IPv6存在。
- **show ip ospf neighbor** —显示邻接路由器的路由器ID、优先级和状态。并且，此命令显示依然是的时间路由器等待从相邻收到开放最短路径优先(OSPF) hello信息包在宣称相邻前下来。它也显示此相邻直接地被联络OSPF邻居形成邻接接口和接口的IP地址。
- **show ipv6 interface brief** —验证隧道接口是UP。
- **show interfaces tunnel 0** —验证被配置的隧道目的地在路由表里被认识。
- **show ipv6 rip** —显示Ipv6 rip信息。
- **show ipv6 protocols** —显示IPv6路由协议的状况。

如果对远程IPv6网络的ping发生故障，请验证IPv6路由通过Ipv6 rip是获知。

```
R1-ipv6#show ipv6 route
IPv6 Routing Table - 6 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea
Timers: Uptime/Expires
L   2000:1:1:1:1:1:1:1112/128 [0/0]
     via ::, Ethernet0/1
C   2000:1:1:1:1:1:1:0/112 [0/0]
     via ::, Ethernet0/1
R   3000::/112 [120/2]
     via FE80::202:B9FF:FECB:D281, Ethernet0/1
R   4000:1:1:1:1:1:1:0/112 [120/3]
     via FE80::202:B9FF:FECB:D281, Ethernet0/1
L   FE80::/10 [0/0]
     via ::, Null0
L   FF00::/8 [0/0]
     via ::, Null0
R1-ipv6#
```

在R2，请验证Ipv6 rip路由从隧道0接口是获知。

```
R2-ipv6-ipv4#show ipv6 route
IPv6 Routing Table - 7 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea
Timers: Uptime/Expires
L   2000:1:1:1:1:1:1:1111/128 [0/0]
     via ::, FastEthernet0/1
C   2000:1:1:1:1:1:1:0/112 [0/0]
     via ::, FastEthernet0/1
L   3000::1/128 [0/0]
     via ::, Tunnel0
C   3000::/112 [0/0]
     via ::, Tunnel0
R   4000:1:1:1:1:1:1:0/112 [120/2]
     via FE80::230:80FF:FEF3:4701, Tunnel0
L   FE80::/10 [0/0]
     via ::, Null0
L   FF00::/8 [0/0]
     via ::, Null0
R2-ipv6-ipv4#
```

如果有连接的问题，首先请验证IPv4网络是完整的。并且，请验证OSPF邻居adjacenciesand有路由对IPv4地址，是远程隧道接口的隧道源。然后请验证您能**连接**在与IPv4 ping的隧道源之间。

```
R2-ipv6-ipv4#show ip ospf neighbor
Neighbor ID     Pri   State           Dead Time   Address         Interface
192.23.1.3        1   FULL/  -        00:00:36    192.23.1.3      Serial0/0
R2-ipv6-ipv4#
R3-ipv4#show ip ospf neighbor
Neighbor ID     Pri   State           Dead Time   Address         Interface
1.1.1.1           1   FULL/  -        00:00:30    192.34.1.4      Serial0/1
192.23.1.2        1   FULL/  -        00:00:35    192.23.1.2      Serial0/0
R3-ipv4#
R4-ipv4-ipv6#show ip ospf neighbor
Neighbor ID     Pri   State           Dead Time   Address         Interface
192.23.1.3        1   FULL/  -        00:00:35    192.34.1.3      Serial1/5
R4-ipv4-ipv6#
```

在R2，请验证IPv6隧道接口启用，并且您能IPv6 ping与IPv4-compatible IPv6地址的远程隧道源。如果隧道接口发生故障，请验证被配置的隧道目的地在路由表里被认识。因为隧道目的地不在路由表里，这是在网络的IPv4部分的一个问题。

```
R2-ipv6-ipv4#show ipv6 interface brief
FastEthernet0/0            [up/up]
    unassigned
Serial0/0                  [up/up]
    unassigned
FastEthernet0/1            [up/up]
    2000:1:1:1:1:1:1:1111
Tunnel0                    [up/up]
    3000::1
R2-ipv6-ipv4#
R2-ipv6-ipv4#show interfaces tunnel 0
Tunnel0 is up, line protocol is up
  Hardware is Tunnel
  MTU 1514 bytes, BW 9 Kbit, DLY 500000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation TUNNEL, loopback not set
  Keepalive not set
  Tunnel source 192.23.1.2 (Serial0/0), destination 192.34.1.4
  Tunnel protocol/transport IPv6/IP, key disabled, sequencing disabled
  Tunnel TTL 255
  Checksumming of packets disabled
  Last input 00:00:09, output 00:00:19, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue :0/0 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     3119 packets input, 361832 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     3117 packets output, 361560 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
R2-ipv6-ipv4#
```

如果仍有IPv6路由的问题，并且IPv4网络被验证，您需要检查Ipv6 rip配置。

```
R2-ipv6-ipv4#show ipv6 rip
RIP process "6bone", port 521, multicast-group FF02::9, pid 111
     Administrative distance is 120.  Routing table is 0
     Updates every 30 seconds, expire after 180
     Holddown lasts 180 seconds, garbage collect after 120
     Split horizon is on; poison reverse is off
     Default routes are not generated
     Periodic updates 176, trigger updates 1
R2-ipv6-ipv4#
R2-ipv6-ipv4#show ipv6 protocols
IPv6 Routing Protocol is "connected"
IPv6 Routing Protocol is "static"
IPv6 Routing Protocol is "rip 6bone"
  Interfaces:
    FastEthernet0/1
    Tunnel0
  Redistribution:
    Redistributing protocol rip 6bone
```

如果没有使用，请保证计时器是同样默认设置。在本例中，默认值在所有Ipv6 rip路由器使用。验证

所有RIP激活的接口正确地配置保证的配置。并且，请验证同一个RIP进程名是一致在网络中。若需要，您能查看debug ipv6 rip的输出。如同所有调试，必须当心不超载CPU和控制台记录缓冲区。

摘要

本文展示隧道如何在同一网络可以用于为了IPv6和IPv4能共存。这也许是必要的在转换时候。要切记的一件事关于IPv6配置是那Ipv6 rip，网络语句没有使用。Ipv6 rip被启用全局，并且每个接口在RIP参与，并且为Ipv6 rip是启用的。在IPv6 BGP示例中，自动隧道部分要求使用**address-family ipv6命令**集输入BGP语句。

Related Information

- 实现IPv6的隧道
- IPv6 ：提供在一个IPv4骨干网的IPv6服务使用隧道
- Cisco IOS IPv6配置库
- IPv6 ：连接到6bone使用6to4隧道
- IP版本6 (IPv6) -支持页面
- BGP 支持页
- Technical Support & Documentation - Cisco Systems