

IPv6配置示例的静态NAT-PT

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简介

使用配置示例IPv6网络节点传递与IPv4网络节点使用在NAT-PT路由器配置的一IPv6映射IPv4地址的本文解释如何实现静态NAT-PT。

网络地址转换-协议转换(NAT-PT)是IPv6到IPv4转换机制，允许IPv6-only设备与IPv4-only设备联络反之亦然。NAT-PT设计部署允许使用单个V4地址的IPv6-only网络和IPv4-only网络之间的直接通信透明地。

先决条件

要求

尝试进行此配置之前，请确保满足以下要求：

- NAT概念和操作基础知识。
- IPv6编址方案基础知识
- IPv6静态路由基础知识

注意：NAT-PT由IETF视为贬抑由于其与域名系统(DNS)的紧密耦合和其在转换的一般限制，并且证明作为技术太复杂以至于不能保养可扩展平移服务。使用NAT-PT的反对和在用户中的增加的IPv6转换导致了NAT64的介绍。参考这些文档关于NAT64的更多信息：

- [NAT64技术：连接IPv6和IPv4网络](#)
- [NAT64-Stateless与有状态的](#)
- [IPv6有状态的NAT64配置示例](#)

使用的组件

在本文的配置根据在Cisco IOS软件版本12.4(15)T 13的Cisco 3700系列路由器。

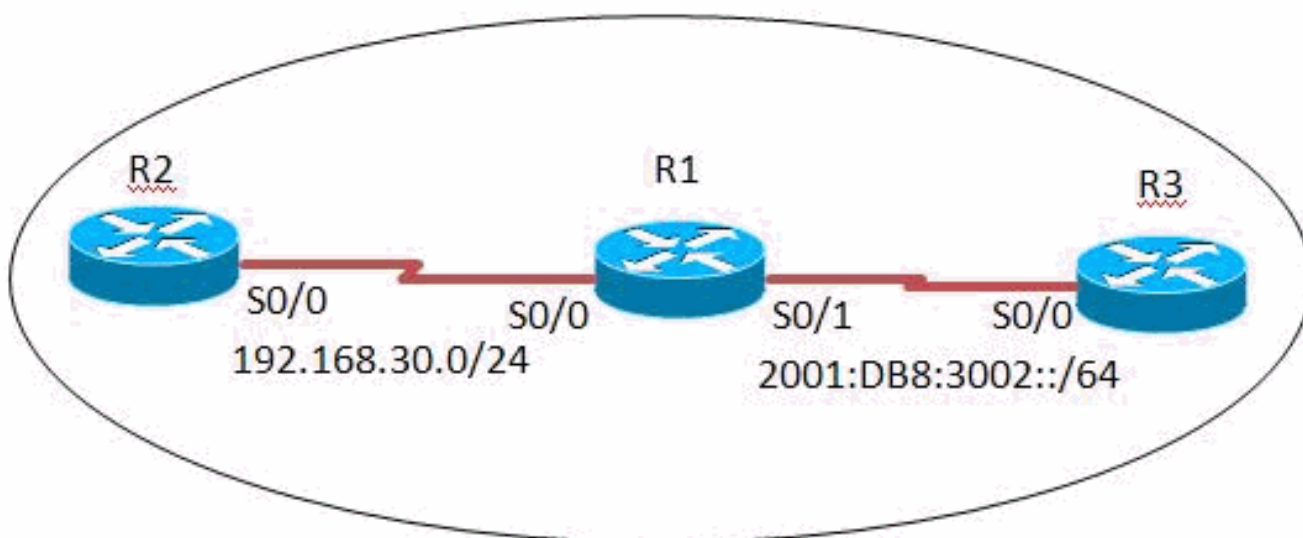
配置

在本例中，三路由器R1，R2和R3通过使用IPv6地址，R1作为NAT-PT路由器，连接到路由器R2使用IPv4地址和对R3的serial interfaces连接。

注意：思科快速转发(CEF)不支持NAT-PT，并且必须禁用。

网络图

此示例使用此网络设置：



配置

此示例使用这些配置：

- [路由器 R1 配置](#)
- [路由器 R2 配置](#)
- [路由器R3配置](#)

R1 的配置

```
hostname R1
ipv6 unicast-routing
!
interface Serial0/0
 ip address 192.168.30.10 255.255.255.0
 duplex auto
 speed auto
 ipv6 nat
!
interface Serial0/1
 no ip address
 duplex auto
 speed auto
 ipv6 address 2001:DB8:3002::9/64
 ipv6 enable
!
```

```
ipv6 route ::/0 2001:DB8:3002::10
ipv6 nat v4v6 source 192.168.30.9 2000::960B:202
!--- Translates the ipv4 add of R2 fa0/0 to ipv6 address. ipv6 nat v6v4 source 3001:11:0:1::1 150.11.3.
Translates the ipv6 add of loop0 of R3 to ipv4 address. ipv6 nat prefix 2000::/96 !--- The destination
prefixes that matches 2000::/96 !--- are translated by NAT-PT. ! end
```

R2 配置

```
hostname R2
!
interface Serial0/0
 ip address 192.168.30.9 255.255.255.0
 duplex auto
 speed auto
!
ip route 0.0.0.0 0.0.0.0 192.168.30.10
!
!
end
```

R3 配置

```
hostname R3
ipv6 unicast-routing
!
interface Loopback0
 no ip address
 ipv6 address 3001:11:0:1::1/64
!
interface Serial0/0
 no ip address
 duplex auto
 speed auto
 ipv6 address 2001:DB8:3002::10/64
!
ipv6 route ::/0 2001:DB8:3002::9
!
```

验证

使用本部分可确认配置能否正常运行。

在路由器 R3 中

现在从R3 Loopback0 IPv6地址的所有数据包应该能到达fa0/0 R2 IPv4地址使用IPv6地址2000::960B:202如显示此处：

ping

```
R3#ping 2000::960b:202 sou lo 0
```

```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2000::960B:202, timeout is 2 seconds:
Packet sent with a source address of 3001:11:0:1::1
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 8/60/124 ms
!--- This shows that the router R3 is able to reach
!--- the router R2 through lo address 3001:11:0:1::1.
```

在路由器 R2 中

ping

```
R2#ping 150.11.3.1
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 150.11.3.1, timeout is 2 seconds:
```

```
!!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 24/68/120 ms
```

```
!--- The successful ping response shows that the router R2
```

```
!--- is able to reach the IPv6 network.
```

在路由器 R1 中

show ipv6 nat translations

show ipv6 nat translations

```
R1#show ipv6 nat translations
```

Prot	IPv4 source	IPv6 source
	IPv4 destination	IPv6 destination
---	---	---
	192.168.30.9	2000::960B:202
---	150.11.3.1	3001:11:0:1::1
	---	---

```
R1#show ipv6 nat translations
```

Prot	IPv4 source	IPv6 source
	IPv4 destination	IPv6 destination
---	---	---
	192.168.30.9	2000::960B:202
---	150.11.3.1	3001:11:0:1::1
	---	---

```
!--- This command displays the active NAT-PT translations in the router.
```

调试IPv6 nat详细

调试IPv6 nat详细

```
R1#debug ipv6 nat detailed
```

```
R1#
```

```
*Mar 1 09:12:41.877: IPv6 NAT: Found prefix 2000::/96
```

```
*Mar 1 09:12:41.881: IPv6 NAT: IPv4->IPv6:  
    src (192.168.30.9 -> 2000::960B:202)  
    dst (0.0.0.0 -> ::)  
    ref_count = 1, usecount = 0, flags = 513,  
    rt_flags = 0, more_flags = 0
```

```
*Mar 1 09:12:41.881: IPv6 NAT: IPv4->IPv6:  
    src (0.0.0.0 -> ::)  
    dst (150.11.3.1 -> 3001:11:0:1::1)  
    ref_count = 1, usecount = 0, flags = 257,  
    rt_flags = 0, more_flags = 0
```

```
*Mar 1 09:12:41.925: IPv6 NAT: IPv6->IPv4:  
    src (3001:11:0:1::1 -> 150.11.3.1)  
    dst (2000::960B:202 -> 192.168.30.9)  
    ref_count = 1, usecount = 0, flags = 2,  
    rt_flags = 0, more_flags = 0
```

```
*Mar 1 09:12:41.925: IPv6 NAT: icmp src (3001:11:0:1::1) -> (150.11.3.1),  
    dst (2000::960B:202) -> (192.168.30.9)
```

```
*Mar  1 09:12:41.965: IPv6 NAT: Found prefix 2000::/96
*Mar  1 09:12:41.965: IPv6 NAT: IPv4->IPv6:
      src (192.168.30.9 -> 2000::960B:202)
      dst (150.11.3.1 -> 3001:11:0:1::1)
      ref_count = 1, usecount = 0, flags = 2,
      rt_flags = 0,
```

!--- This command displays detailed information about NAT-PT events.

故障排除

目前没有针对此配置的故障排除信息。

相关信息

- [网络地址转换\(NAT\)支持页面](#)
- [Cisco IOS IPv6 命令参考](#)
- [IPv6技术支持](#)
- [技术支持和文档 - Cisco Systems](#)