Contents

Introduction

This document explains how to implement Static NAT-PT that uses a configuration example where IPv6 network nodes communicate with IPv4 network nodes that use an IPv6 mapping of the IPv4 address configured on the NAT-PT router.

The Network Address Translation - Protocol Translation (NAT-PT) is an IPv6 to IPv4 translation mechanism, which allows IPv6-only devices to communicate with IPv4-only devices and vice versa. NAT-PT is designed to be deployed to allow direct communication between IPv6-only networks and IPv4-only networks transparently that use a single V4 address.

Prerequisites

Requirements

Ensure that you meet these requirements before you attempt this configuration:

- Basic knowledge of NAT concepts and operations.
- Basic knowledge of IPv6 Addressing Scheme
- Basic knowledge of IPv6 Static Routing

  Note: NAT-PT has been deemed deprecated by IETF because of its tight coupling with Domain Name System (DNS) and its general limitations in translation, and it has proven as technology to be too complex to maintain scalable translational services. With the deprecation of NAT-PT and the increasing IPv6 transition among users has led to the introduction of NAT64. Refer to these documents for more information on NAT64:

  - [NAT64 Technology: Connecting IPv6 and IPv4 Networks](#)
  - [NAT64-Stateless versus Stateful](#)
  - [IPv6 Stateful NAT64 Configuration Example](#) ⌁

Components Used

The configurations in this document are based on the Cisco 3700 series router on Cisco IOS® Software Release 12.4 (15)T 13.
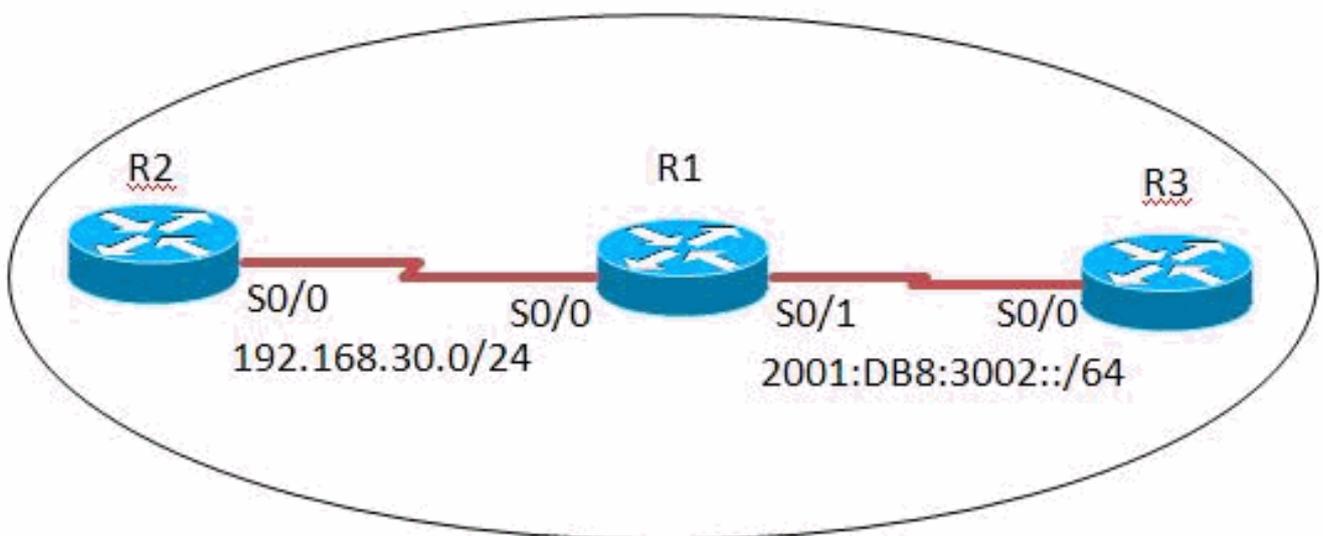
Configure

In this example, three routers R1, R2 and R3 are connected through a serial interface where R1 acts as NAT-PT router, which connects to the router R2 using IPv4 address and to R3 using IPv6 address.

Note: NAT-PT is not supported in Cisco Express Forwarding (CEF) and has to be disabled.

Network Diagram

This example uses this network setup:

Configurations

This example uses these configuration:

- Router R1 Configuration
- Router R2 Configuration
- Router R3 Configuration

R1 Configuration

R2 Configuration

R3 Configuration

Verify

Use this section in order to confirm that your configuration works properly.

In Router R3

Now any packet from IPv6 address of Loopback0 of R3 should be able to reach fa0/0 IPv4 address of R2 using the IPv6 address 2000::960B:202 as shown here:

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.
```

In Router R2

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.
```

In Router R1

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.
```

debug ipv6 nat detailed

debug ipv6 nat detailed

```
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.
```

Troubleshoot

There is currently no specific troubleshooting information available for this configuration.

Related Information

- **Network Address Translation (NAT) Support Page**
- **Cisco IOS IPv6 Command Reference**
- **IPv6 Technology Support**
- **Technical Support & Documentation - Cisco Systems**