

# IOS NAT Load-Balancing for Two ISP Connections

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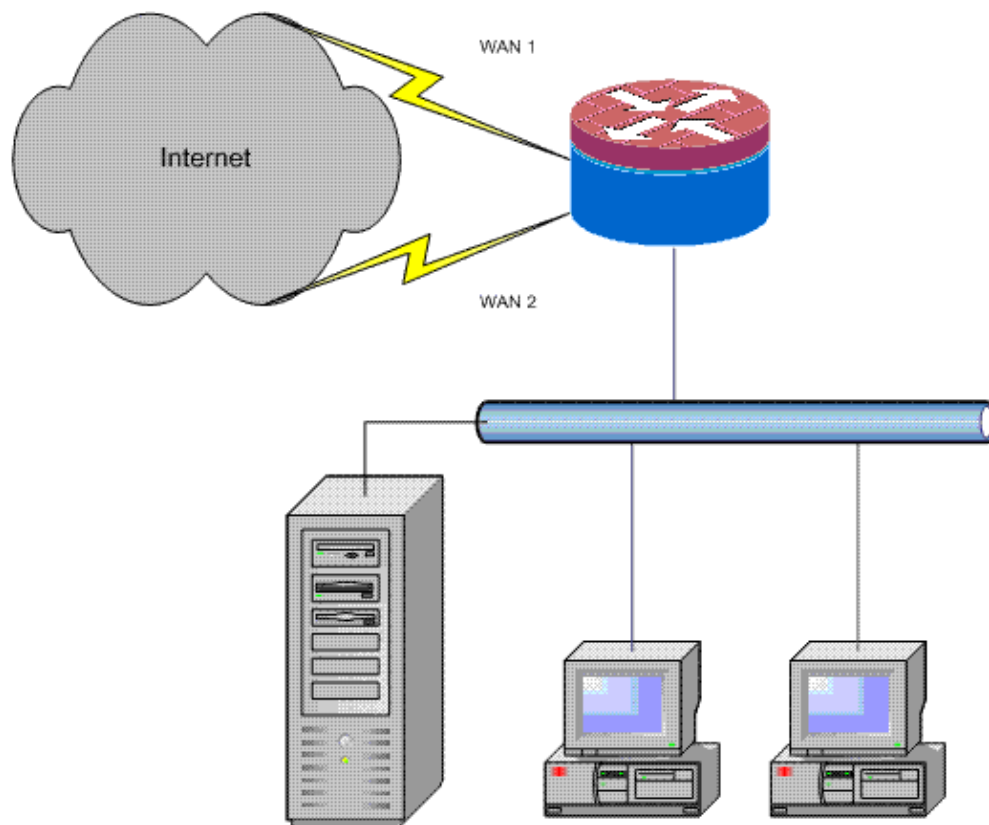
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## Introduction

This document describes a configuration for a Cisco IOS<sup>®</sup> router to connect a network to the Internet with Network Address Translation (NAT) through two ISP connections. The NAT of the Cisco IOS Software can distribute subsequent TCP connections and UDP sessions over multiple network connections, if equal-cost routes to a given destination are available.



## Prerequisites

## Requirements

This document assumes you start to work with LAN and WAN connections, and does not provide configuration or troubleshooting background to establish initial connectivity. This document does not describe a mechanism to differentiate between the routes; thus, there is no way to prefer a more-desirable connection over a less-desirable connection.

## Components Used

This configuration was developed with the use of a Cisco 1811 router with Cisco IOS Software Release 12.4(15)T3 Advanced IP Services software. If a different software version is used, some features are possibly not available, or the configuration commands can differ from those shown in this document. Similar configuration should be available on all Cisco IOS router platforms, although the interface configuration likely varies between different platforms.

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

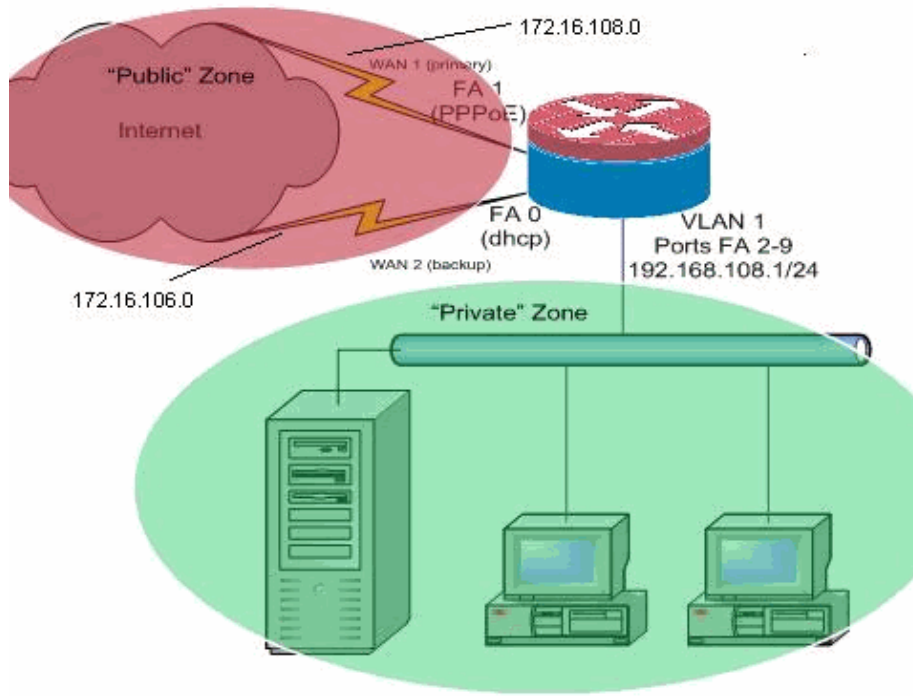
You need to add policy-based routing for specific traffic to be sure that it always uses one ISP connection. Examples of traffic that require this behavior include IPsec VPN clients, VoIP telephony traffic, and any other traffic that should always use only one of the ISP connection options to prefer the same IP address, higher speed, or lower latency on the connection.

In this section, you are presented with the information to configure the features described in this document.

**Note:** Use the Command Lookup Tool (registered customers only) in order to find more information on the commands used in this document.

## Network Diagram

This document uses this network setup:



This configuration example describes an access router that uses a DHCP-configured IP connection to one ISP, which is shown by FastEthernet 0, and a PPPoE connection over the other ISP connection. The connection types have no particular impact on the configuration, although some connections types can hinder the usability of this configuration in specific failure scenarios, particularly in cases where IP connectivity over an Ethernet-connected WAN service is used, for example, a cable modem or DSL services where an additional device terminates the WAN connectivity and provides Ethernet hand-off to the Cisco IOS router. In cases where static IP addressing is applied, as opposed to DHCP-assigned addresses or PPPoE, and a WAN failure occurs such that the Ethernet port still maintains the Ethernet link to the WAN connectivity device, the router continues to attempt to load-balance connectivity across both the good and bad WAN connections. If your deployment requires that inactive routes be removed from load-balancing, refer to the configuration provided in the document, *IOS NAT Load-Balancing with Optimized Edge Routing For Two Internet Connections*, that describes the addition of Optimized Edge Routing in order to monitor route validity.

## Configurations

This document uses this configuration:

```
interface FastEthernet0
 ip address dhcp
 ip nat outside
 ip virtual-reassembly
 !
interface FastEthernet1
 no ip address
 pppoe enable
 no cdp enable
 !
interface FastEthernet2
 no cdp enable
 !
!
interface Vlan1
```



- **show ip nat translation** Displays NAT activity between NAT inside hosts and NAT outside hosts. This command provides verification that inside hosts are being translated to both NAT outside addresses.

```
Router#show ip nat translation
Pro Inside global      Inside local      Outside local      Outside global
tcp 172.16.108.44:54486 192.168.108.3:54486 172.16.104.10:22 172.16.104.10:22
tcp 172.16.106.42:49620 192.168.108.3:49620 172.16.102.11:80 172.16.102.11:80
tcp 172.16.108.44:1623 192.168.108.4:1623 172.16.102.11:445 172.16.102.11:445
Router#
```

- **show ip route** Verifies that multiple routes to the Internet are available.

```
Router#show ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is 172.16.108.1 to network 0.0.0.0

C    192.168.108.0/24 is directly connected, Vlan1
     172.16.0.0/24 is subnetted, 2 subnets
C      172.16.108.0 is directly connected, FastEthernet4
C      172.16.106.0 is directly connected, Vlan106
S*   0.0.0.0/0 [1/0] via 172.16.108.1
      [1/0] via 172.16.106.1
Router#
```

## Troubleshoot

Use this section to troubleshoot your configuration.

After you configure the Cisco IOS router with NAT, if the connections do not work, be sure that:

- NAT is applied appropriately on outside and inside interfaces.
- NAT configuration is complete, and ACLs reflect the traffic that must be NATed.
- Multiple routes to the Internet/WAN are available.

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## Related Information

- [Configuring Network Address Translation Features Roadmap](#)
  - [Technical Support & Documentation – Cisco Systems](#)
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