

o – Sample Configuration Using the ip nat outside source list C

Table of Contents

<u>Sample Configuration Using the ip nat outside source list Command</u>	1
<u>Introduction</u>	1
<u>Before You Begin</u>	1
<u>Conventions</u>	1
<u>Prerequisites</u>	1
<u>Components Used</u>	1
<u>Configure</u>	1
<u>Network Diagram</u>	1
<u>Configurations</u>	2
<u>Verify</u>	3
<u>Troubleshoot</u>	3
<u>Summary</u>	4
<u>Related Information</u>	5

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Introduction

Before You Begin

- Conventions

- Prerequisites

- Components Used

Configure

- Network Diagram

- Configurations

Verify

Troubleshoot

Summary

Related Information

Introduction

This document provides a sample configuration using the ip nat outside source list command, including a brief description of what happens to the IP packet during the NAT process. Let's consider the following network topology as an example.

Before You Begin

Conventions

For more information on document conventions, see the Cisco Technical Tips Conventions.

Prerequisites

There are no specific prerequisites for this document.

Components Used

This document is not restricted to specific software and hardware versions.

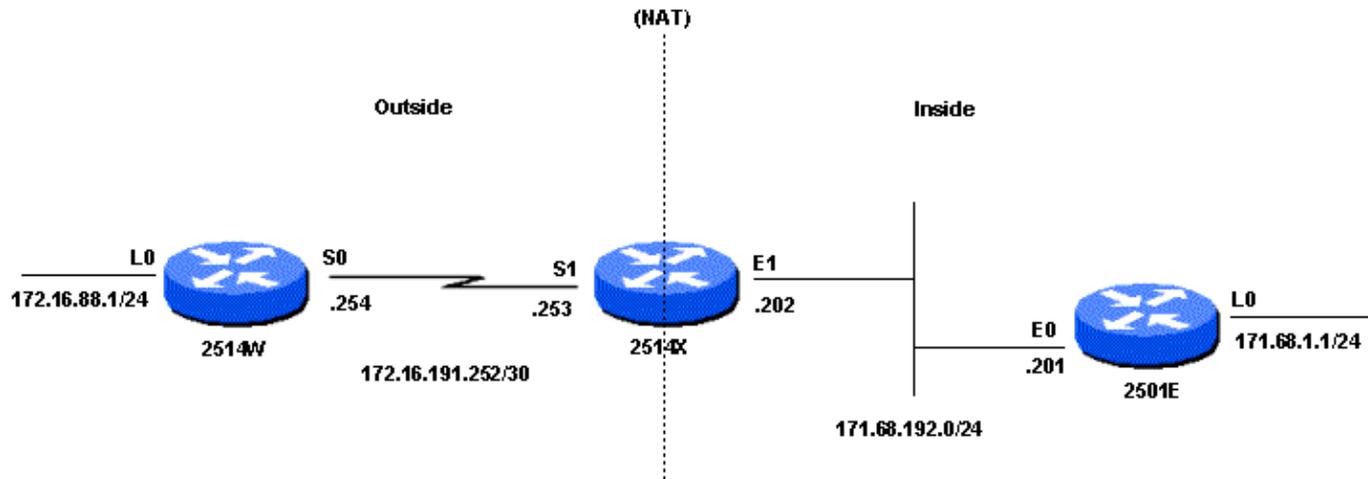
Configure

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

Note: To find additional information on the commands used in this document, use the Command Lookup Tool (registered customers only) .

Network Diagram

This document uses the network setup shown in the diagram below.



A ping packet sourced from Router 2514w's loopback0 interface (172.16.88.1) to Router 2501e's 171.68.1.1 address succeeds. On the outside interface of Router 2514x, the packet has a source address (SA) of 172.16.88.1 and a Destination Address (DA) of 171.68.1.1. If the SA is permitted in access-list 1, which is used by the ip nat outside source list command, it's translated to an address from the NAT pool Net171. Notice that the **ip nat outside source list** command references the NAT pool "Net171". In this case, the address is translated to 171.68.16.10. After translation, Router 2514x looks for the destination in the routing table, and routes the packet. Router 2501e sees the packet on its incoming interface with a SA of 171.68.16.10 and a DA of 171.68.1.1. It responds by sending an Internet Control Message Protocol (ICMP) echo reply to 171.68.16.10. If it doesn't have a route, it drops the packet. In this case, it has a (default) route, so it sends a packet to Router 2514x, using an SA of 171.68.1.1 and a DA of 171.68.16.10. Router 2514x sees the packet and checks for a route to the 171.68.16.10 address. If it doesn't have one, it responds with an ICMP unreachable reply. In this case, it has a route to 171.68.16.10, so it translates the packet back to the 172.16.88.1 address, and routes the packet out its outside interface.

Configurations

Router 2514w
<pre>hostname rp-2514w ! interface Loopback0 ip address 172.16.88.1 255.255.255.0 ! interface Serial0 ip address 172.16.191.254 255.255.255.252 no ip mroute-cache ! ip classless ip route 0.0.0.0 0.0.0.0 172.16.191.253 !</pre>

Router 2514x
<pre>hostname rp-2514x ! ip nat pool Net171 171.68.16.10 171.68.16.254 netmask 255.255.255.0 ip nat outside source list 1 pool Net171 ! interface Ethernet1</pre>

```

ip address 171.68.192.202 255.255.255.0
ip nat inside
no ip mroute-cache
no ip route-cache
!
interface Serial1
ip address 172.16.191.253 255.255.255.252
ip nat outside
no ip mroute-cache
no ip route-cache
clockrate 2000000
!
ip classless
ip route 172.16.88.0 255.255.255.0 172.16.191.254
ip route 171.68.1.0 255.255.255.0 171.68.192.201
ip route 171.68.16.0 255.255.255.0 Serial1
access-list 1 permit 172.16.88.0 0.0.0.255
!

```

Router 2501e

```

hostname rp-2501e
!
interface Loopback0
ip address 171.68.1.1 255.255.255.0
!
interface Ethernet0
ip address 171.68.192.201 255.255.255.0
!
ip classless
ip route 0.0.0.0 0.0.0.0 171.68.192.202
!

```

Verify

There is currently no verification procedure available for this configuration.

Troubleshoot

This section provides information you can use to troubleshoot your configuration.

The following output is the result of running the **debug ip packet** and **debug ip nat** commands on Router 2514x, while pinging from Router 2514x's loopback0 interface address (172.16.188.1) to Router 2501e's loopback0 interface address (171.68.1.1).

```

rp-2514x#
NAT: s=172.16.88.1->171.68.16.10, d=171.68.1.1 [40]
IP: s=171.68.16.10 (Serial1), d=171.68.1.1 (Ethernet1), g=171.68.192.201, len
100, forward ICMP type=8, code=0
NAT: s=171.68.1.1, d=171.68.16.10->172.16.88.1 [40]
IP: s=171.68.1.1 (Ethernet1), d=172.16.88.1 (Serial1), g=172.16.191.254, len
100, forward ICMP type=0, code=0

NAT: s=172.16.88.1->171.68.16.10, d=171.68.1.1 [41]
IP: s=171.68.16.10 (Serial1), d=171.68.1.1 (Ethernet1), g=171.68.192.201, len
100, forward ICMP type=8, code=0

```

```

NAT: s=171.68.1.1, d=171.68.16.10->172.16.88.1 [41]
IP: s=171.68.1.1 (Ethernet1), d=172.16.88.1 (Serial1), g=172.16.191.254, len
100, forward ICMP type=0, code=0

NAT: s=172.16.88.1->171.68.16.10, d=171.68.1.1 [42]
IP: s=171.68.16.10 (Serial1), d=171.68.1.1 (Ethernet1), g=171.68.192.201, len
100, forward ICMP type=8, code=0
NAT: s=171.68.1.1, d=171.68.16.10->172.16.88.1 [42]
IP: s=171.68.1.1 (Ethernet1), d=172.16.88.1 (Serial1), g=172.16.191.254, len
100, forward ICMP type=0, code=0

NAT: s=172.16.88.1->171.68.16.10, d=171.68.1.1 [43]
IP: s=171.68.16.10 (Serial1), d=171.68.1.1 (Ethernet1), g=171.68.192.201, len
100, forward ICMP type=8, code=0
NAT: s=171.68.1.1, d=171.68.16.10->172.16.88.1 [43]
IP: s=171.68.1.1 (Ethernet1), d=172.16.88.1 (Serial1), g=172.16.191.254, len
100, forward ICMP type=0, code=0

NAT: s=172.16.88.1->171.68.16.10, d=171.68.1.1 [44]
IP: s=171.68.16.10 (Serial1), d=171.68.1.1 (Ethernet1), g=171.68.192.201, len
100, forward ICMP type=8, code=0
NAT: s=171.68.1.1, d=171.68.16.10->172.16.88.1 [44]
IP: s=171.68.1.1 (Ethernet1), d=172.16.88.1 (Serial1), g=172.16.191.254, len
100, forward ICMP type=0, code=0

```

Summary

The major difference between using the **ip nat outside source list** command (dynamic NAT) instead of the **ip nat outside source static** command (static NAT) is that there are no entries in the translation table until the router (configured for NAT) verifies the translation criteria of the packet. In the example above, the packet with the SA 172.16.88.1 (which comes into Router 2514x's outside interface) satisfies access-list 1, the criteria used by the **ip nat outside source list** command. For this reason, packets must originate from the outside network before packets from the inside network can communicate with Router 2514w's loopback0 interface.

There are two important things to note in this example.

First, when the packet travels from outside to inside, translation occurs first, and then the routing table is checked for the destination. When the packet is travels from inside to outside, the routing table is checked for the destination first, and then translation occurs.

Second, it's important to note which part of the IP packet gets translated when using each of the commands above. The following table contains a guideline:

Command	Action
ip nat outside source list	<ul style="list-style-type: none"> • translates the source of the IP packets that are traveling outside to inside • translates the destination of the IP packets that are traveling inside to outside
ip nat inside source list	<ul style="list-style-type: none"> • translates the source of IP packets that are

- | |
|---|
| traveling inside to outside |
| • translates the destination of the IP packets that are traveling outside to inside |

What the above guidelines indicate is that there is more than one way to translate a packet. Depending on your specific needs, you should determine how to define the NAT interfaces (inside or outside) and what routes the routing table should contain before or after translation. Keep in mind that the portion of the packet that will be translated depends upon the direction the packet is traveling, and how you configured NAT.

Related Information

- [NAT Support Page](#)
- [Technical Support – Cisco Systems](#)

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