

NAT in Catalyst 6500/6000 Switches Configuration Example

Document ID: 97262

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Introduction

This document explains how to configure Network Address Translation (NAT) on Cisco Catalyst 6500/6000 Series Switches.

Prerequisites

Requirements

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

- Familiarity with how NAT works.
 - Refer to [How NAT Works](#) for more information.
- Familiarity with the commands to use in order to configure NAT on a router.

For more information on the commands, refer to [Configuring Network Address Translation: Getting Started](#).

Components Used

The information in this document is based on the Cisco Catalyst 6500 Series Switch with Supervisor Engine 720 that runs Cisco IOS® Software Release 12.2(18)SXD6 and the Cisco Catalyst 6500 Series Switch with Supervisor Engine II that runs CatOS Software Release 8.4(4).

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.

Related Products

This configuration can also be used with Cisco Catalyst 6000 Series Switches.

Conventions

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

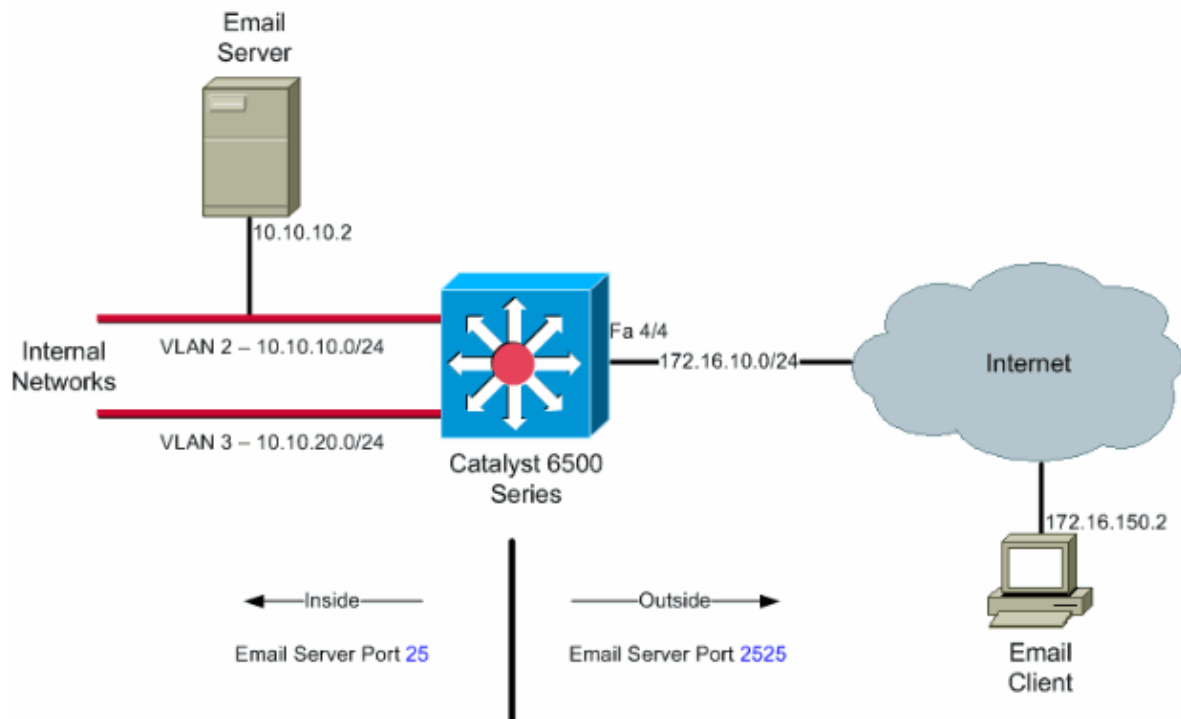
Configure

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) to obtain more information on the commands used in this section.

Network Diagram

This document uses this network setup:



Note: The IP addressing schemes used in this configuration are not legally routable on the Internet. They are RFC 1918 addresses which have been used in a lab environment.

Cisco IOS Configurations

In this configuration example, NAT is configured to overload on the interface FastEthernet 4/4 IP address. This means that more than one inside local address can be dynamically translated to the same global address. In this case, the address assigned to interface FastEthernet 4/4.

In addition, NAT is statically configured so that packets sourced from local address 10.10.10.2 with TCP port 25 (SMTP) are translated to interface FastEthernet 4/4 IP address TCP port 2525. Since this is a static NAT entry, email clients on the outside can originate SMTP packets to the global address of 172.16.10.64. The

outside port has been chosen as 2525 to prevent any Denial of Service attacks.

Catalyst 6500 in Native Mode

```
6509sup720#show running-config
Building configuration...
Current configuration : 7524 bytes
!
version 12.2
service timestamps debug datetime
service timestamps log datetime msec localtime
service password-encryption
service counters max age 10
!
hostname 6509sup720
!
boot system sup-bootflash:s72033-psv-mz.122-18.SXD6.bin
!username maui-nas-05 password cisco

!
no ip domain-lookup
!
no mls flow ip
no mls flow ipv6
spanning-tree mode pvst
!
redundancy
mode sso
main-cpu
!
!
interface FastEthernet4/4
ip address 172.16.10.64 255.255.255.0
ip nat outside

!--- Defines interface FastEthernet 4/4 with an IP address and as a
!--- NAT outside interface.

!
interface Vlan2
ip address 10.10.10.1 255.255.255.0
ip nat inside

!--- Defines interface VLAN 2 with an IP address and as a NAT inside
!--- interface.

!
interface Vlan3
ip address 10.10.20.1 255.255.255.0
ip nat inside

!--- Defines interface VLAN 3 with an IP address and as a NAT inside
!--- interface.

!
ip nat inside source list 100 interface FastEthernet 4/4 overload

!--- Specifies the translation for inside workstations and
!--- servers to access the outside world.

ip nat inside source static tcp 10.10.10.2 25 interface FastEthernet 4/4 2525

!--- Specifies the static mapping for the outside email clients
!--- to access the inside email server.
```

```

!--- Refer to ip nat inside source for more details
!--- on the command.

!
!
ip classless
no ip http server
!

!--- ACL 100 permits only the desired traffic for translation.

access-list 100 permit ip 10.10.10.0 0.0.0.255 any
access-list 100 permit ip 10.10.20.0 0.0.0.255 any
!
line con 0
transport input none
line vty 0 4
!
end

```

CatOS Configurations

For switches that run in Hybrid mode you need to first configure the VLANs on the Supervisor and then apply the NAT configuration on the MSFC. Instead of having an outside port interface, you need to configure an interface VLAN since, in Hybrid mode, you cannot specify an IP addresses for a particular port.

Catalyst 6500 in Hybrid Mode

Configurations on the Supervisor (Switch Processor)

```

!--- Configure VLAN 2, VLAN 3 and VLAN 4 on the Supervisor.

!--- Add VLAN 2.

Catalyst6500> (enable) set vlan 2
VLAN 2 configuration successful

!--- Add VLAN 3.

Catalyst6500> (enable) set vlan 3
VLAN 3 configuration successful

!--- Add VLAN 4.

Catalyst6500> (enable) set vlan 4
VLAN 4 configuration successful

!--- Assign port fa4/4 to VLAN 4.

Catalyst6500> (enable) set vlan 4 4/4
VLAN 4 modified.
VLAN 1 modified.
VLAN  Mod/Ports
-----
4      4/4
Catalyst6500> (enable)

```

Catalyst 6500 in Hybrid Mode

Configurations on the MSFC (Route Processor)

```
MSFC#show running-config
Building configuration...

Current configuration : 1024 bytes
!
version 12.1
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Router
!
boot system flash bootflash:c6msfc2-jk2o3sv-mz.121-26.E1.bin
!
ip subnet-zero
!
!
!
ip ssh time-out 120
ip ssh authentication-retries 3
redundancy
  high-availability
  single-router-mode
!
!
!
!
!
interface Vlan2
  ip address 10.10.10.1 255.255.255.0
  ip nat inside

!--- Defines interface VLAN 2 with an IP address and as a NAT inside
!--- interface.

!
interface Vlan3
  ip address 10.10.20.1 255.255.255.0
  ip nat inside

!--- Defines interface VLAN 3 with an IP address and as a NAT inside
!--- interface.

!
interface Vlan4
  ip address 172.16.10.64 255.255.255.0
  ip nat outside

!--- Defines interface VLAN 4 with an IP address and as a NAT outside
!--- interface.

!
ip nat inside source list 100 interface Vlan4 overload

!--- Specifies the translation for inside workstations and
!--- servers to access the outside world.

ip nat inside source static tcp 10.10.10.2 25 interface Vlan4 2525

!--- Specifies the static mapping for the outside email clients
!--- to access the inside email server.
```

```

ip classless
no ip http server
!
access-list 100 permit ip 10.10.10.0 0.0.0.255 any
access-list 100 permit ip 10.10.20.0 0.0.0.255 any

!--- ACL 100 permits only the desired traffic for translation.

!
!
line con 0
line vty 0 4
  no login
!
!
end

```

Verify

Use this section to confirm that your configuration works properly.

The Output Interpreter Tool (registered customers only) (OIT) supports certain show commands. Use the OIT to view an analysis of show command output

- **show ip nat translations** Displays active NAT translations.

```

Cat6k#show ip nat translations
Pro Inside global      Inside local      Outside local      Outside global
tcp 172.16.10.64:2525  10.10.10.2:25     ---                ---

```

- **show ip access-list** Displays the contents of all current IP access lists.

```

Cat6k#show ip access-lists
Extended IP access list 100
  permit ip 10.10.10.0 0.0.0.255 any (32 matches)
  permit ip 10.10.20.0 0.0.0.255 any (22 matches)
  deny ip any any

```

- **show ip nat statistics** Displays NAT statistics.

Troubleshoot

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

Troubleshooting Commands

The Output Interpreter Tool (registered customers only) (OIT) supports certain **show** commands. Use the OIT to view an analysis of **show** command output.

Note: Refer to Important Information on Debug Commands before you use **debug** commands.

- **debug ip nat** Displays information about IP packets translated by the IP NAT feature.

```

Cat6k#debug ip nat
IP NAT debugging is on
Cat6k#
*Mar  1 01:40:47.692 CET: NAT: s=10.10.10.2->172.16.10.4, d=172.16.150.2 [80]
*Mar  1 01:40:47.720 CET: NAT*: s=172.16.150.2, d=172.16.10.4->10.10.10.2 [80]

```

```
*Mar 1 01:40:47.720 CET: NAT*: s=10.10.20.2->172.16.10.4, d=172.16.150.2 [81]
*Mar 1 01:40:47.748 CET: NAT*: s=172.16.150.2, d=172.16.10.4->10.10.20.2 [81]
*Mar 1 01:40:47.748 CET: NAT*: s=10.10.10.2->172.16.10.4, d=172.16.150.2 [82]
*Mar 1 01:40:47.784 CET: NAT*: s=172.16.150.2, d=172.16.10.4->10.10.10.2 [82]
*Mar 1 01:40:47.784 CET: NAT*: s=10.10.20.2->172.16.10.4, d=172.16.150.2 [83]
*Mar 1 01:40:47.836 CET: NAT*: s=172.16.150.2, d=172.16.10.4->10.10.20.2 [83]
*Mar 1 01:40:47.836 CET: NAT*: s=10.10.10.2->172.16.10.4, d=172.16.150.2 [84]
*Mar 1 01:40:47.884 CET: NAT*: s=172.16.150.2, d=172.16.10.4->10.10.10.2 [84]
```

- **clear ip nat translation *** Clears **dynamic** Network Address Translation (NAT) translations from the translation table.

Related Commands

- **ip nat** Designates that traffic which originates from or destined for the interface is subject to NAT.
- **ip nat inside destination** Enables NAT of the inside destination address.
- **ip nat inside source** Enables NAT of the inside source address.
- **ip nat outside source** Enables NAT of the outside source address.

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Network Infrastructure: LAN Routing and Switching

Network Infrastructure: Getting Started with LANs

Related Information

- [Network Address Translation Catalyst Switch Support Matrix](#)
- [NAT Support Page](#)
- [Cisco Catalyst 6500 Series Switches](#)
- [LAN Product Support](#)
- [LAN Switching Technology Support](#)
- [Technical Support & Documentation – Cisco Systems](#)

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Updated: Aug 01, 2007

Document ID: 97262
