



Scalability for Stateful NAT

The Scalability for Stateful NAT feature allows Stateful Network Address Translation (SNAT) to control the Hot Standby Router Protocol (HSRP) state change until the NAT information is completely exchanged. The ability to change the default TCP mode to User Datagram Protocol (UDP) mode, and the ability to disable asymmetric queuing have been added. When UDP mode is used, SNAT will send messages over UDP mode using a proprietary acknowledgement/retransmit mechanism.

History for the Scalability for Stateful NAT Feature

Release	Modification
12.4(3)	This feature was introduced.
12.4(4)T	This feature was integrated into Cisco IOS Release 12.4(4)T.

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at <http://www.cisco.com/go/fn>. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

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Restrictions for the Scalability for Stateful NAT Feature

The Scalability for Stateful NAT feature is not available in Primary/Backup mode.

SNAT features are not backward compatible. See “[Configuring NAT for High Availability](#)” for information on SNAT features introduced in other releases of Cisco IOS software.

Information About Scalability for Stateful NAT

Before enabling the Scalability for Stateful NAT feature, be sure you understand the following concepts:

- [SNAT Feature Design, page 2](#)
- [Benefits of SNAT Scalability, page 2](#)

SNAT Feature Design

Two or more Network Address Translators function as a translation group. One member of the group handles traffic requiring translation of IP address information. It also informs the backup translator of active flows as they occur. The backup translator can then use information from the active translator to prepare duplicate translation table entries, and in the event that the active translator is hindered by a critical failure, the traffic can rapidly be switched to the backup. The traffic flow continues since the same network address translations are used, and the state of those translations has been previously defined.

Only sessions that are statically defined already receive the benefit of redundancy without the need for this feature. In the absence of SNAT, sessions that use dynamic NAT mappings would be severed in the event of a critical failure and would have to be reestablished. Stateful NAT enables continuous service for dynamically mapped NAT sessions.

SNAT can be configured to operate with HSRP to provide redundancy and the active and standby state changes are managed by HSRP.

Benefits of SNAT Scalability

This feature enables SNAT control of the HSRP state change until the NAT information is completely exchanged.

- The TCP default transport mode can be switched to UDP mode with acknowledgement/retransmit support.
- Queuing during asymmetric routing can be disabled to avoid delay in the data path for the creation of new entries and traffic on special ports (Application Layer Gateway (ALG) support).

How to Configure SNAT in HSRP Mode

This section contains the following procedure:

- [Configuring SNAT in HSRP Mode, page 3](#)

Configuring SNAT in HSRP Mode

Perform this task to configure an HSRP router with SNAT.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface ethernet** *interface-number port-number*
4. **standby** *group-name* | **ip** *ip-address* [**secondary**]
5. **standby delay reload** *seconds*
6. **standby** *group-number* **preempt delay minimum** *seconds* **reload** *seconds* **sync** *seconds*
7. **exit**
8. **ip nat stateful** *id id-number* **redundancy name** **mapping-id** *map-number* [**protocol udp**] [**as-queuing disable**]
9. **ip nat pool** *name start-ip end-ip* **prefix-length** *prefix-length*
10. **ip nat inside source route-map** *name* **pool** *pool-name* **mapping-id** *map-number* [**overload**]

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables higher privilege levels, such as privileged EXEC mode. Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	interface ethernet <i>interface-number port-number</i> Example: Router(config)# interface ethernet 1/1	Enters interface configuration mode.
Step 4	standby <i>group-name</i> ip [<i>ip-address</i> [secondary]] Example: Router(config-if)# standby SNATHSRP ip 10.1.1.1 secondary	Enables the HSRP protocol.
Step 5	standby delay reload <i>seconds</i> Example: Router(config-if)# standby delay reload 60	This command must be configured in order for SNAT to control HSRP state change until NAT information is completely exchanged.

	Command or Action	Purpose
Step 6	<p>standby <i>group-number</i> preempt delay minimum <i>seconds</i> reload <i>seconds</i> sync <i>seconds</i></p> <p>Example: Router(config-if)# standby 1 preempt delay minimum 60 reload 60 sync 60</p>	This command must be configured in order for SNAT to control HSRP state change until NAT information is completely exchanged.
Step 7	<p>exit</p> <p>Example: Router(config-if)# exit</p>	Returns to global configuration mode.
Step 8	<p>ip nat stateful id <i>id-number</i> redundancy <i>name</i> mapping-id <i>map-number</i> [protocol <i>udp</i>] [as-queuing <i>disable</i>]</p> <p>Example: Router(config)# ip nat stateful id 1 redundancy snathsrp mapping-id 10 protocol udp as-queuing disable</p>	Specifies SNAT on routers configured for HSRP. The optional UDP protocol and disabling of asymmetric queuing is also configured.
Step 9	<p>ip nat pool <i>name</i> <i>start-ip</i> <i>end-ip</i> prefix-length <i>prefix-length</i></p> <p>Example: Router(config)# ip nat pool snatpool1 10.1.1.1 10.1.1.9 prefix-length 24</p>	Defines a pool of IP addresses.
Step 10	<p>ip nat inside source route-map <i>name</i> pool <i>pool-name</i> mapping-id <i>map-number</i> [overload]</p> <p>Example: Router(config)# ip nat inside source route-map rm-101 pool snatpool1 mapping-id 10 overload</p>	Enables stateful NAT for the HSRP translation group.

Configuration Examples for SNAT in HSRP Mode

This section provides the following configuration example:

[Configuring SNAT in HSRP Mode: Example, page 4](#)

Configuring SNAT in HSRP Mode: Example

The following example shows how to configure SNAT in HSRP mode with asymmetric queuing disabled and UDP enabled:

```
!
standby delay minimum 30 reload 60
standby 1 ip 10.1.1.1
standby 1 name SNATHSRP
standby 1 preempt delay minimum 60 reload 60 sync 60
!
```

```

ip nat Stateful id 1
redundancy SNATHSRP
mapping-id 10
as-queuing disable
protocol udp
ip nat pool SNATPOOL1 10.1.1.1 10.1.1.9 prefix-length 24
ip nat inside source route-map rm-101 pool SNATPOOL1 mapping-id 10 overload
ip classless
ip route 10.1.1.0 255.255.255.0 Null0
no ip http server
ip pim bidir-enable

```

Additional References

The following sections provide references related to the Scalability for Stateful NAT feature.

Related Documents

Related Topic	Document Title
Using HSRP and SNAT for high availability configuration tasks	“Configuring NAT for High Availability” module
NAT commands: complete command syntax, command mode command history, defaults, usage guidelines, and examples	<i>Cisco IOS IP Addressing Services Command Reference</i>

Standards

Standard	Title
None	—

MIBs

MIB	MIBs Link
None	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
None	—

Technical Assistance

Description	Link
The Cisco Technical Support website contains thousands of pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/techsupport

Command Reference

The following commands are introduced or modified in the feature or features documented in this module. For information about these commands, see the *Cisco IOS IP Addressing Command Reference* at http://www.cisco.com/en/US/docs/ios/ipaddr/command/reference/iad_book.html. For information about all Cisco IOS commands, go to the Command Lookup Tool at <http://tools.cisco.com/Support/CLILookup> or to the *Cisco IOS Master Commands List*.

- **ip nat stateful id**

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