



Monitoring Carrier Grade NAT Configurations

Carrier Grade NAT is a large-scale Network Address Translation (NAT) that provides translation of millions of private IPv4 addresses to public IPv4 addresses. These translations support subscribers and content providers with a bandwidth throughput of at least 10 Gbps full-duplex.

Carrier Grade NAT addresses the IPv4 address completion problem. It employs Network Address and Port Translation (NAPT) to aggregate many private IPv4 addresses into fewer public IPv4 addresses. For example, a single public IPv4 address with a pool of 32,000 port numbers supports 320 individual private IP subscribers, assuming that each subscriber requires 100 ports. Carrier Grade NAT also offers a way to implement a graceful transition to IPv6 addresses.

To route internal public addresses to external public addresses, a VPN Routing and Forwarding (VRF) instance is created. Interfaces are created for the VRF at the subscriber-side (private) and the Internet-side (public). The VRF enables static or dynamic routing of protocols on the interfaces.

Prime Network supports the following instances for Carrier Grade NAT:

- Stateful Address Translation- NAT44 Stateful
- Stateless Address Translation- NAT 64 Stateless (X-LAT)
- IPv6 rapid deployment (6rd)

Each Carrier Grade NAT instance has several attributes listed under them, such as preferred location, address pools, associated interfaces, and statistics. The attributes are grouped under related categories. The categories and attributes are listed below:



Note

IPv4 Network Address Translation (NAT44) is not supported for devices running Cisco IOS XR software version 4.1.

For information on the devices that support Carrier Grade NAT, refer to [Cisco Prime Network 4.2 Supported VNEs](#).

The following topics describe how to use the Vision client to view Carrier Grade NAT properties. If you cannot perform an operation that is described in these topics, you may not have sufficient permissions; see [Permissions for Managing Carrier Grade NAT](#), page B-16.

- [Viewing Carrier Grade NAT Properties in Logical Inventory](#), page 20-2
- [Viewing Carrier Grade NAT Properties in Physical Inventory](#), page 20-4
- [Configuring a CG NAT Service](#), page 20-5

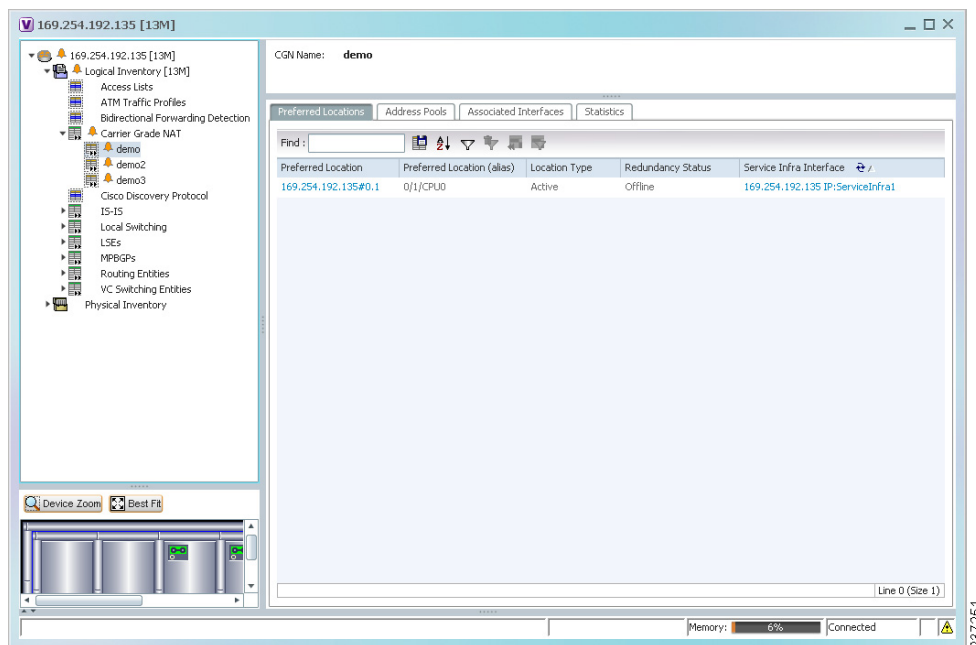
Viewing Carrier Grade NAT Properties in Logical Inventory

To view Carrier Grade NAT properties in logical inventory:

- Step 1** In the Vision client, double-click the Cisco CRS device configured for Carrier Grade NAT.
- Step 2** In the **Inventory** window, click **Logical Inventory > Carrier Grade NAT**.

The Carrier Grade NAT properties are displayed in logical inventory as shown in [Figure 20-1](#).

Figure 20-1 Carrier Grade NAT in Logical Inventory



[Table 20-1](#) describes the Carrier Grade NAT properties that are displayed.

Table 20-1 Carrier Grade NAT Properties in Logical Inventory

Field	Description
CGN Name	Name of the Carrier Grade NAT service.
Preferred Location Tab	
Preferred Location	Hyperlinked entry to the card in physical inventory.
Preferred Location (alias)	Location of module in clear text.
Location Type	Configured type of location: Active or Standby.
Redundancy Status	Redundancy state: Online or Offline. If the field is empty, it means the data was not collected from the device.
Service Infra Interface	Hyperlinked entry to the routing entity in logical inventory. For more information about routing entities in logical inventory, see Viewing Routing Entities, page 17-32 .
Address Pools Tab	
Inside VRF	Hyperlinked entry to the inside VRF in logical inventory. For more information about VRF properties in logical inventory, see Viewing VRF Properties, page 17-28 .
Address Family	Type of IP address in this pool: IPv4 or IPv6.
Outside VRF	Hyperlinked entry to the outside VRF in logical inventory. For more information about VRF properties in logical inventory, see Viewing VRF Properties, page 17-28 .
Address Pool	Range of IP addresses that can be used for the service instance. If an end address is not specified, the entire range of 255 addresses is used for the address pool.
Associated Interfaces Tab	
Interface	Hyperlinked entry to the associated entry in logical inventory: <ul style="list-style-type: none"> For SVI service interfaces, hyperlinked entry to the routing entity in logical inventory. For SVI service applications, hyperlinked entry to the VRF entity in logical inventory.
Service Types Tab	
Service Type Name	Name of the Carrier Grade NAT service.
Service Type	Type of Carrier Grade NAT service: 6RD, XLAT, or NAT44.
Statistics Tab	
Statistics Name	Name of the statistic. For statistic names and descriptions, see Table 20-2 .
Statistics Value	Value of the statistic.

You can also display pool utilization by right-clicking a VNE and choosing **Commands > Show > Pool Utilization**.

Table 20-2 Carrier Grade NAT Statistics in Logical Inventory

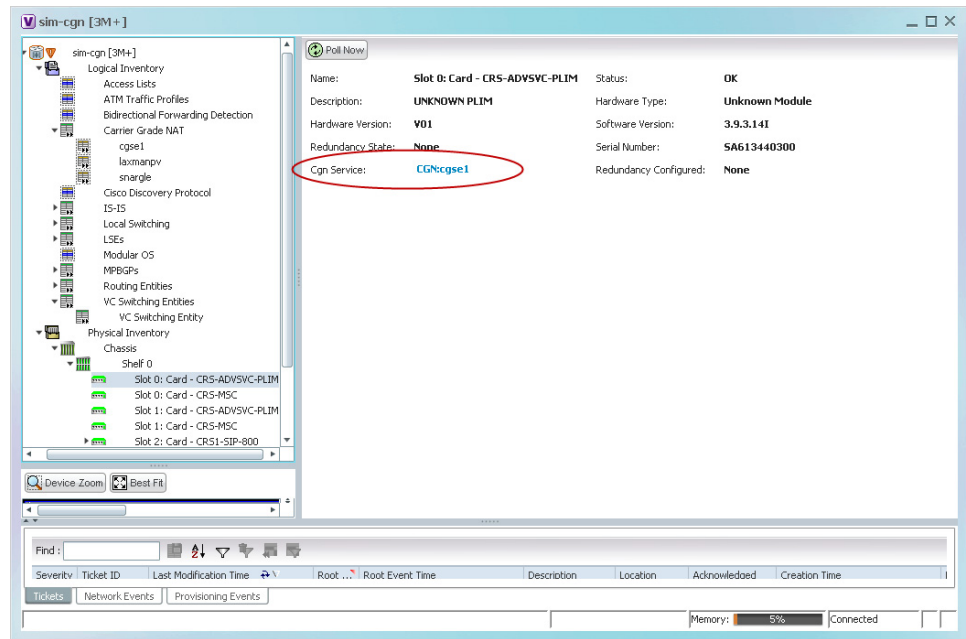
Statistic Name	Description
Inside to outside drops port limit exceeded	Number of packets dropped because the port limit has been exceeded. The value is calculated from the time Carrier Grade NAT was configured and running on the card.
Inside to outside drops resource depletion	Number of packets that are dropped because no ports are available. The value is calculated from the time Carrier Grade NAT was configured and running on the card.
Inside to outside drops limit system reached	Number of packets that are dropped because the system limit has been exceeded. The value is calculated from the time Carrier Grade NAT was configured and running on the card.
Inside to outside forward rate	Number of packets forwarded from the inside to the outside in the last one second.
Outside to inside forward rate	Number of packets forwarded from the outside to the inside in the last one second.
Translations create rate	Number of translation entries created in the last one second.
Translations delete rate	Number of translation entries deleted in the last one second.

Viewing Carrier Grade NAT Properties in Physical Inventory

To view Carrier Grade NAT properties in physical inventory (in this example, a Cisco CRS device):

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- Step 1** In the Vision client, double-click the Cisco CRS device.
 - Step 2** To view Carrier Grade NAT properties configured on a specific interface, click **Physical Inventory > chassis > shelf > slot > card > interface**. See [Drilling Down Into a Port's Configuration Details \(Including Services and Subinterfaces\)](#), page 8-16 for a description of the information displayed in the Subinterfaces table.
 - Step 3** To view Carrier Grade NAT properties configured on a Cisco CRS-CGSE-PLIM card, click **Physical Inventory > chassis > shelf > slot > PLIM-card**. [Figure 20-2](#) shows an example of Carrier Grade NAT properties in physical inventory.

Figure 20-2 Carrier Grade NAT Properties in Physical Inventory



The field CGN Service is displayed, and the entry is hyperlinked to the associated Carrier Grade NAT service in logical inventory.

Configuring a CG NAT Service

The following CG NAT commands can be launched from the inventory by right-clicking the appropriate node and choosing **Commands > Configuration**. Your permissions determine whether you can run these commands (see [Permissions for Managing Carrier Grade NAT, page B-16](#)). To find out if a device supports these commands, see the [Cisco Prime Network 4.2 Supported Cisco VNEs](#).

Command and Navigation	Description
Configure > Add Static Port Forwarding	Configures CG NAT service instance for static port forwarding.
Configure > Add NAT 64 Forwarding	Configures CG NAT service instance for NAT 64.
Configure > Add 6rd Forwarding	Configures CG NAT service instance for 6rd.
Delete > Static Port Forwarding	Removes CG NAT instance.
Show > Pool Utilization	Displays the CGN instance name, inside VRF name, start and end address

