CHAPTER 45

Using Cisco Carrier Grade NAT Commands

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. In future, Carrier Grade NAT may also offer a way to implement a graceful transition to IPv6 addresses.

Carrier Grade NAT attributes and instances are configured as a CRS-ADVSVC-PLIM card on Cisco CRS-1 routers. 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.

Cisco ANA 3.7.x displays the following attributes in the logical inventory of the Cisco ANA NetworkVision application:

- Carrier Grade NAT Instance Name — The Carrier Grade NAT instance name identifies the Carrier Grade NAT instance.

Each Carrier Grade NAT instance has several attributes listed under them. The attributes are grouped under related categories. The categories and attributes are listed below:

- Preferred Location
  - Preferred Location—Hyperlink to the card in physical inventory
  - Preferred Location—Alternate name for card location
  - Location Type—Configured type of location
  - Redundancy Status
  - Service Infra Interface—Hyperlink to routing entity in logical inventory
- Address Pools
  - Inside VRF—Hyperlink to inside VRF in logical inventory
  - Outside VRF—Hyperlink to outside VRF in logical inventory
  - Address Pool—Range of IP Addresses for the instance
  - Address Family—Type of IP Address in this pool
- Associated Interfaces
  - Interface—SVI service-related hyperlink entry to logical inventory

- Statistics
  - Statistics Name
  - Statistics Value

Supported Network Elements

You can run the Carrier Grade NAT commands on the following network element:

- Cisco CRS Series Routers

  Cisco CRS series includes both the CRS-1 and CRS-3 Series Routers.

See Part 1—Cisco VNEs for details on the software versions Cisco ANA supports for these network elements. To run the Carrier Grade NAT commands, the software on the network element must support the Carrier Grade NAT technology.

Configuring Carrier Grade NAT Instance

Use the **Static Port Forwarding** command to add a Carrier Grade NAT instance to the device.

Step 1 In the inventory window, expand the Logical Inventory tree and Carrier Grade NAT node.

Step 2 Right-click any Carrier Grade NAT instance and choose **Commands > Configure > Static Port Forwarding**.

The Static Port Forwarding dialog box opens.

Step 3 By default, the General tab is selected. Enter values for the following parameters.

Input Parameter	Description
Carrier Grade NAT Instance Name	Name of the Carrier Grade NAT instance.
Inside VRF Name	Name of the inside VPN routing and forwarding (VRF).
NAT 44 Name	Name of the NAT 44 instance added under each Carrier Grade NAT Instance Name.
Address Family	Name of the IP address family. The default and only value is IPv4.
Protocol	Name of the protocol session. The values are TCP, UDP, or ICMP. The default value is TCP.
Address	Address of the inside VRF.
Port Number ([1-65535])	Port number for the inside VRF. The range is from 1 to 65535.

Step 4 To see the commands that will be applied on the device, click **Preview**.

You can view the commands in the Result tab. You can go back and make any required changes to the input parameters.

Step 5 To run the commands, click **Execute**.

The newly added Carrier Grade NAT instance appears in the Carrier Grade NAT tree. Any errors are displayed in the Result tab.

Step 6 To close the dialog box, click **Close**.

Removing a Carrier Grade NAT instance

Use the **Static Port Forwarding** command to remove a Carrier Grade NAT instance from the device.

Step 1 In the inventory window, expand the Logical Inventory tree and Carrier Grade NAT node.

Step 2 Right-click the Carrier Grade NAT instance that you want to remove and choose **Commands > Delete > Static Port Forwarding**.

Step 3 The Static Port Forwarding dialog box opens. By default, the General tab is selected.

Step 4 To see the commands that will be applied on the device, click **Preview**.

You can view the commands in the Result tab.

Step 5 To run the commands, click **Execute**.

The Carrier Grade NAT instance is no longer visible under the Carrier Grade NAT tree. Any errors are displayed in the Result tab.

Step 6 To close the dialog box, click **Close**.

Displaying Pool Utilization

Use the **Pool Utilization** command to view the ports that the Carrier Grade NAT instances use in the given address range.

Step 1 In the inventory window, expand the Logical Inventory tree and Carrier Grade NAT node.

Step 2 Right-click the Carrier Grade NAT instance and choose **Commands > Show > Pool Utilization.**

The Pool Utilization dialog box opens.

Step 3 By default, the General tab is selected. Enter values for the following parameters.

Input Parameter	Description
NAT 44 Name	Name of the NAT 44 instance added under the Carrier Grade NAT instance.
Inside VRF Name	Name of the inside VRF.
Start Address	Starting IPv4 address in the range.
End Address	Ending IPv4 address in the range.

Step 4 To see the commands that will be applied on the device, click **Preview**.

You can view the commands in the Result tab. You can go back and make any required changes to the input parameters.

Step 5 To run the commands, click **Execute**.

Any errors are displayed in the Result tab.

Step 6 To close the dialog box, click **Close**.