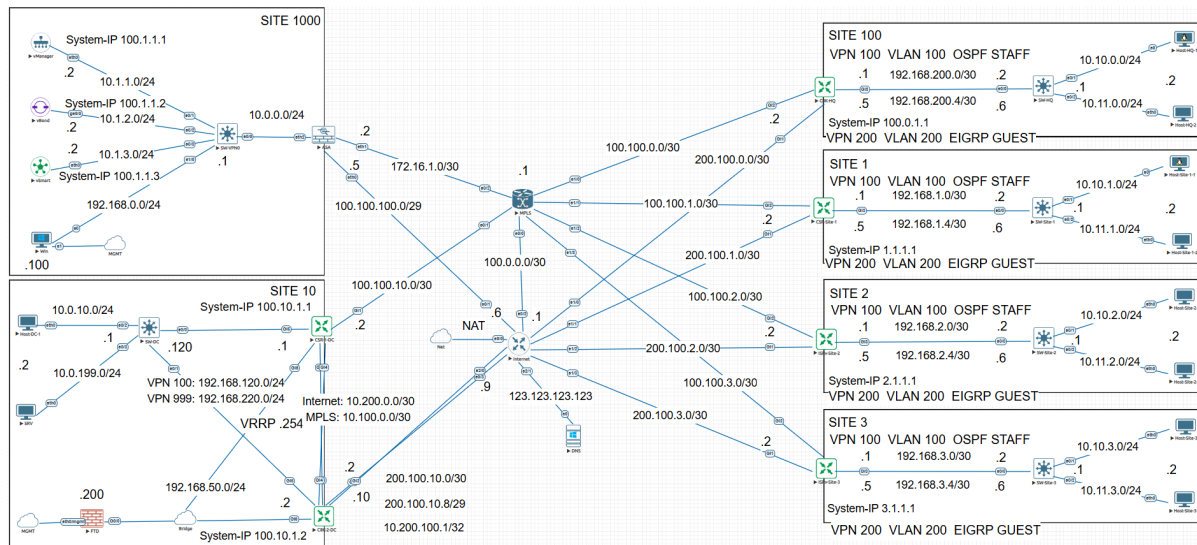


LAB: VIẾT STATIC NAT CHO SITE HQ



Tên Thiết Bị	Username	Password	Version
vManage	admin	Admin	20.06.1
vBond	admin	Admin	20.06.1
vSmart	admin	Admin	20.06.1
cEdge(CSR1000v)	admin	Admin	17.03.04a
cEdge(C8000v)	admin	Admin	17.06.01a
cEdge(ISRv)	admin	Admin	17.02.02
FTD	Admin	Admin	7.4.1
ASA	Admin	Admin	915-16-k8
PC		Test123	Windows10

II. Yêu Cầu:

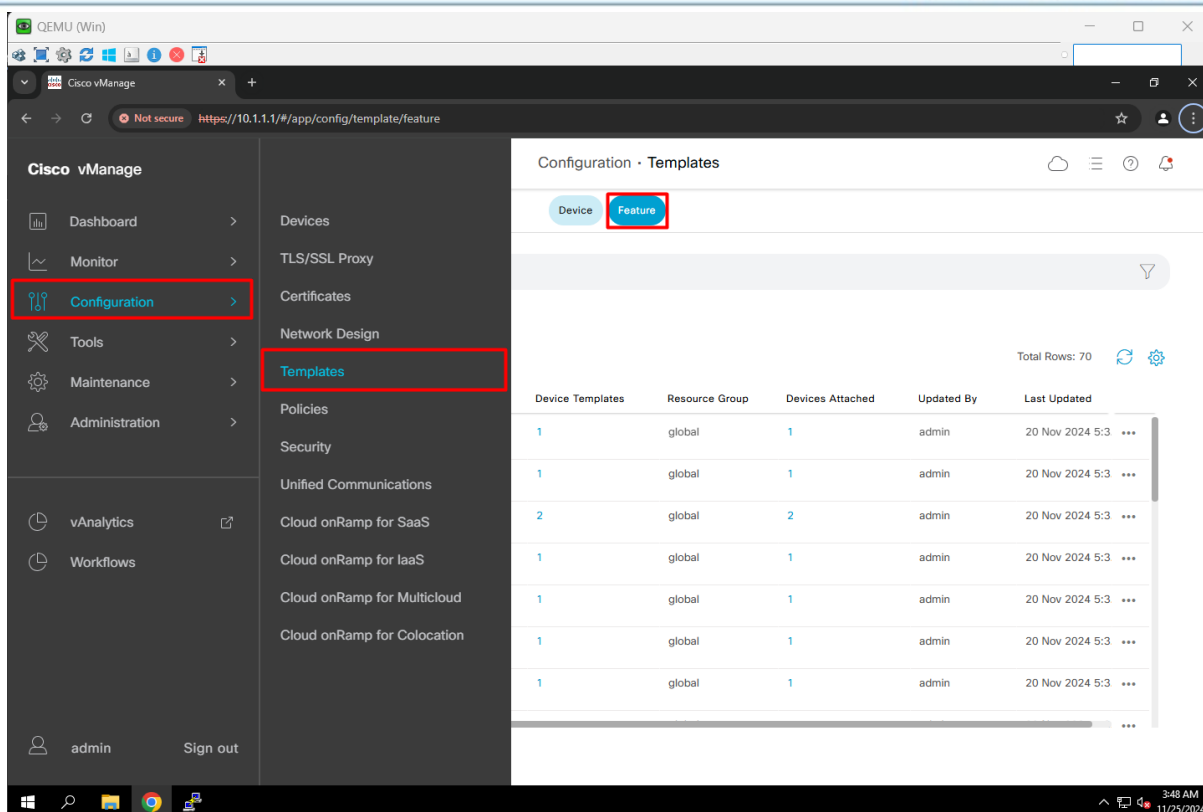
- Viết Static Nat cho site HQ

III. Thực hiện:

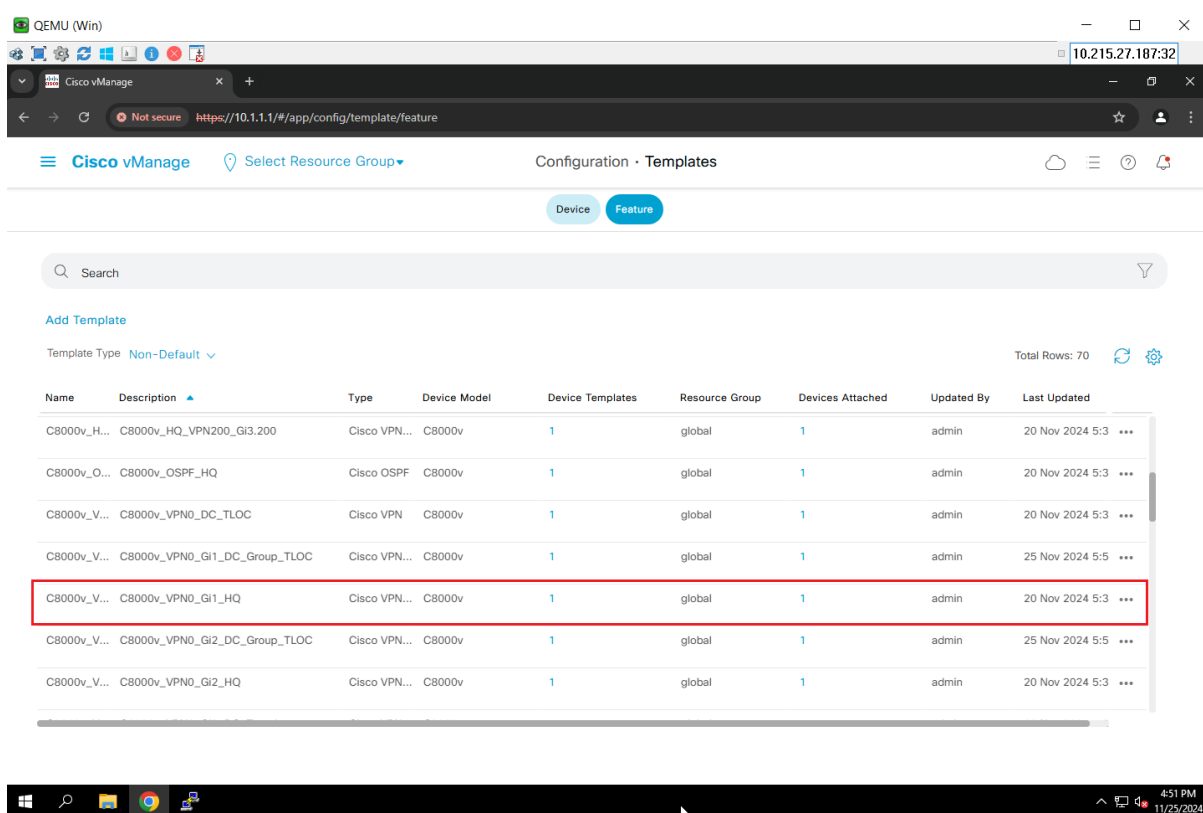
3.1. Thực hiện viết Static Nat

Thực hiện sửa IP trên con C8K-HQ

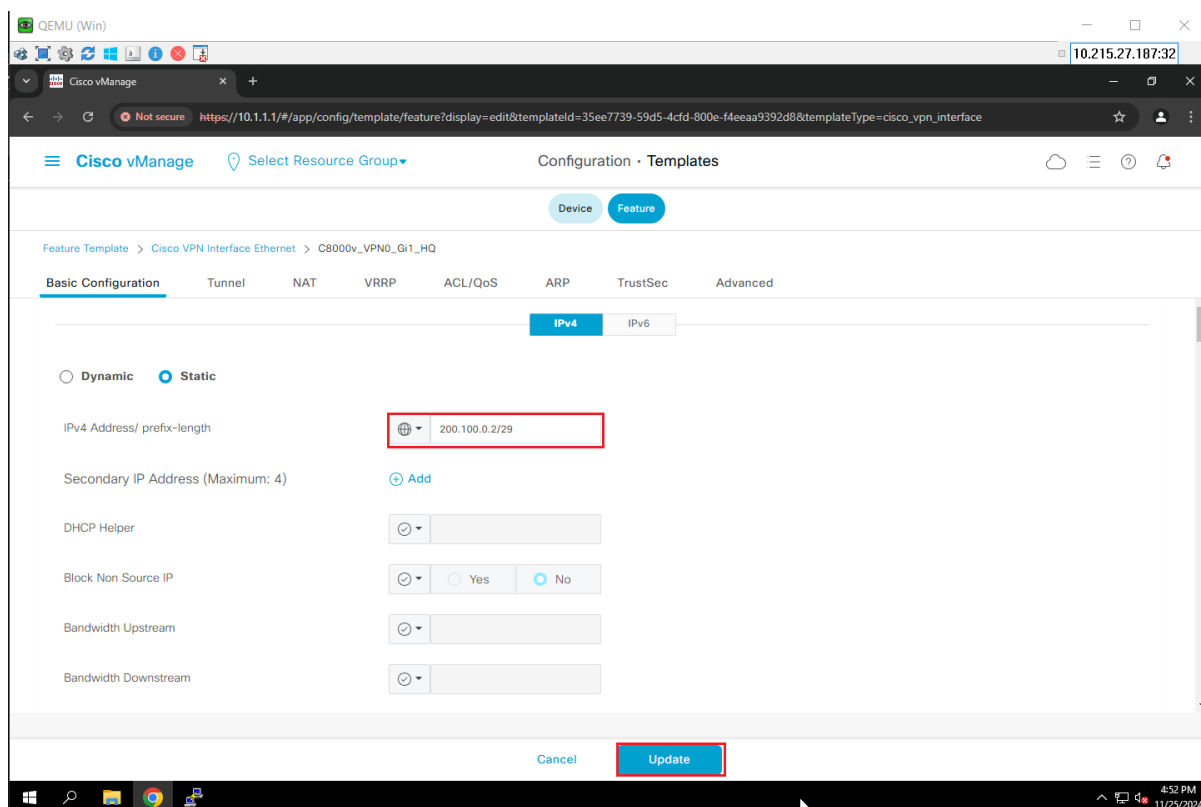
Ở giao diện vManager chọn vào Configuration và sau đó chọn vào Templates và chọn vào Feature



Thực hiện chỉnh sửa Feature Template C8000v_VPN0_Gi1_HQ. Chọn vào dấu ba chấm và chọn vào Edit.



Ở phần Basic Configuration: IPv4 Address/ prefix-length sửa IPv4: 200.100.0.2/29 Và chọn vào Update để cập nhật Feature Template



QEMU (Win) 10.215.27.187:32

Cisco vManage Configuration · Templates

Feature Template > Cisco VPN Interface Ethernet > C8000v_VPN0_Gi1_HQ

Basic Configuration Tunnel NAT VRRP ACL/QoS ARP TrustSec Advanced

Dynamic Static

IPv4 Address/ prefix-length 200.100.0.2/29

Secondary IP Address (Maximum: 4) Add

DHCP Helper

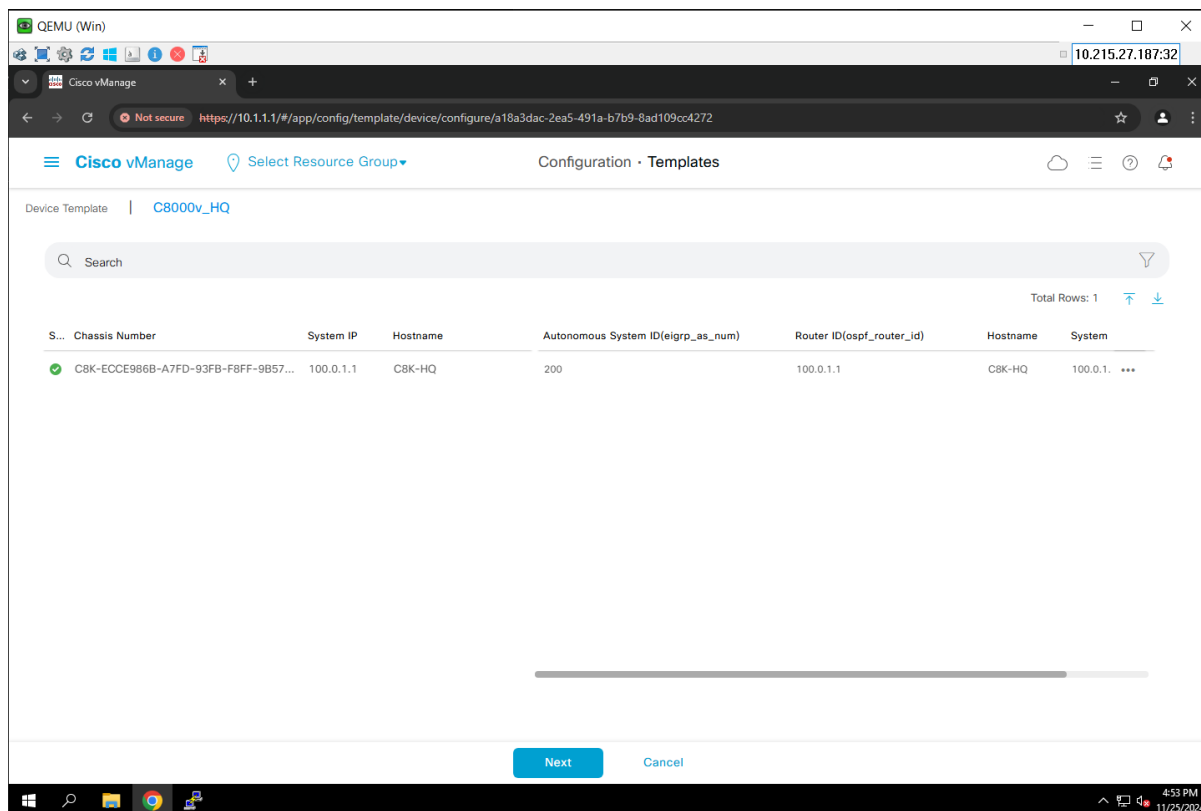
Block Non Source IP Yes No

Bandwidth Upstream

Bandwidth Downstream

Cancel Update

Chọn vào Next



QEMU (Win) 10.215.27.187:32

Cisco vManage Configuration · Templates

Device Template | C8000v_HQ

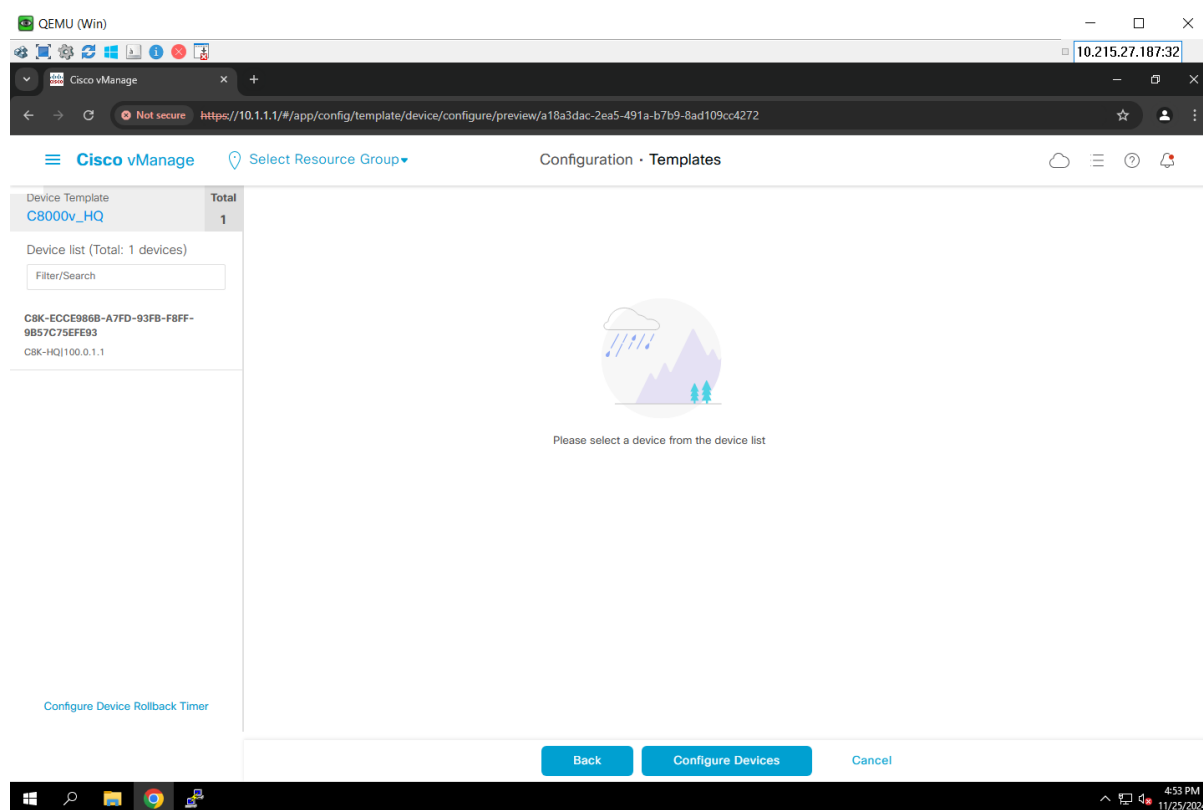
Search

Total Rows: 1

S...	Chassis Number	System IP	Hostname	Autonomous System ID(eigrp_as_num)	Router ID(ospf_router_id)	Hostname	System
✓	C8K-ECCE986B-A7FD-93FB-F8FF-9B57...	100.0.1.1	C8K-HQ	200	100.0.1.1	C8K-HQ	100.0.1. ...

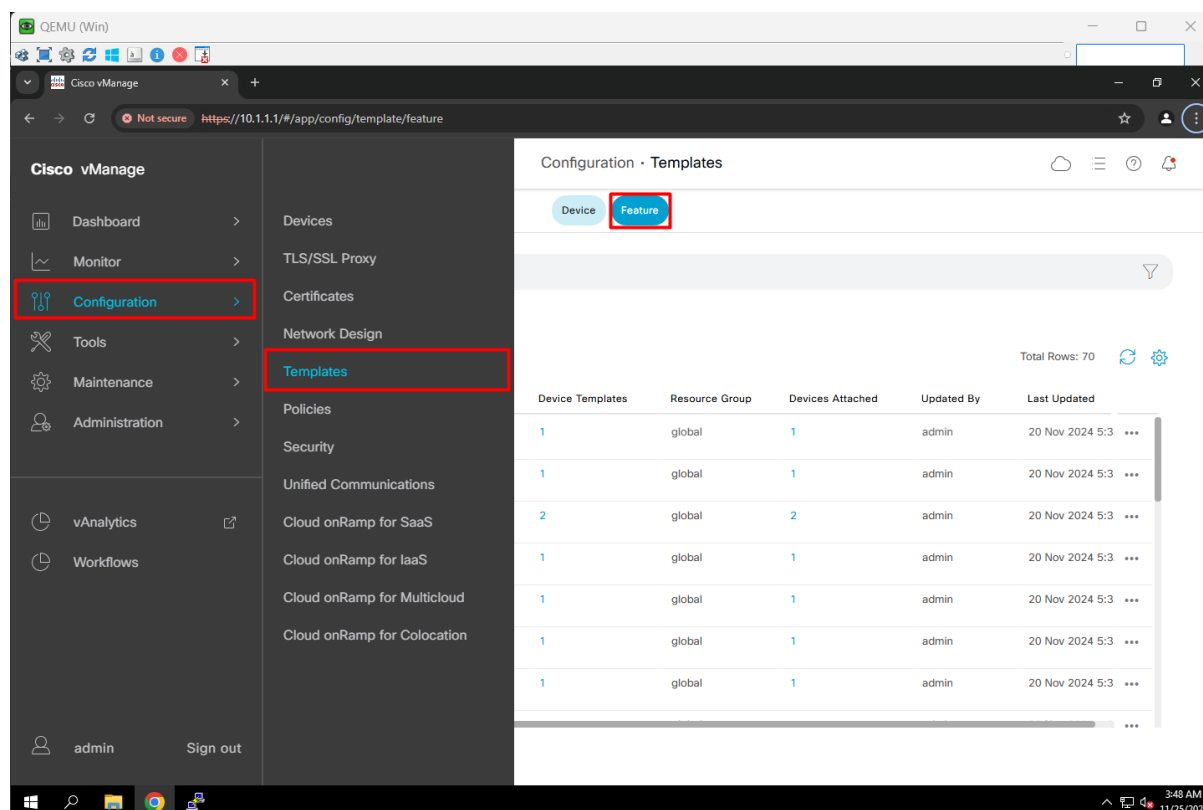
Next Cancel

Chọn tiếp vào Configure Device

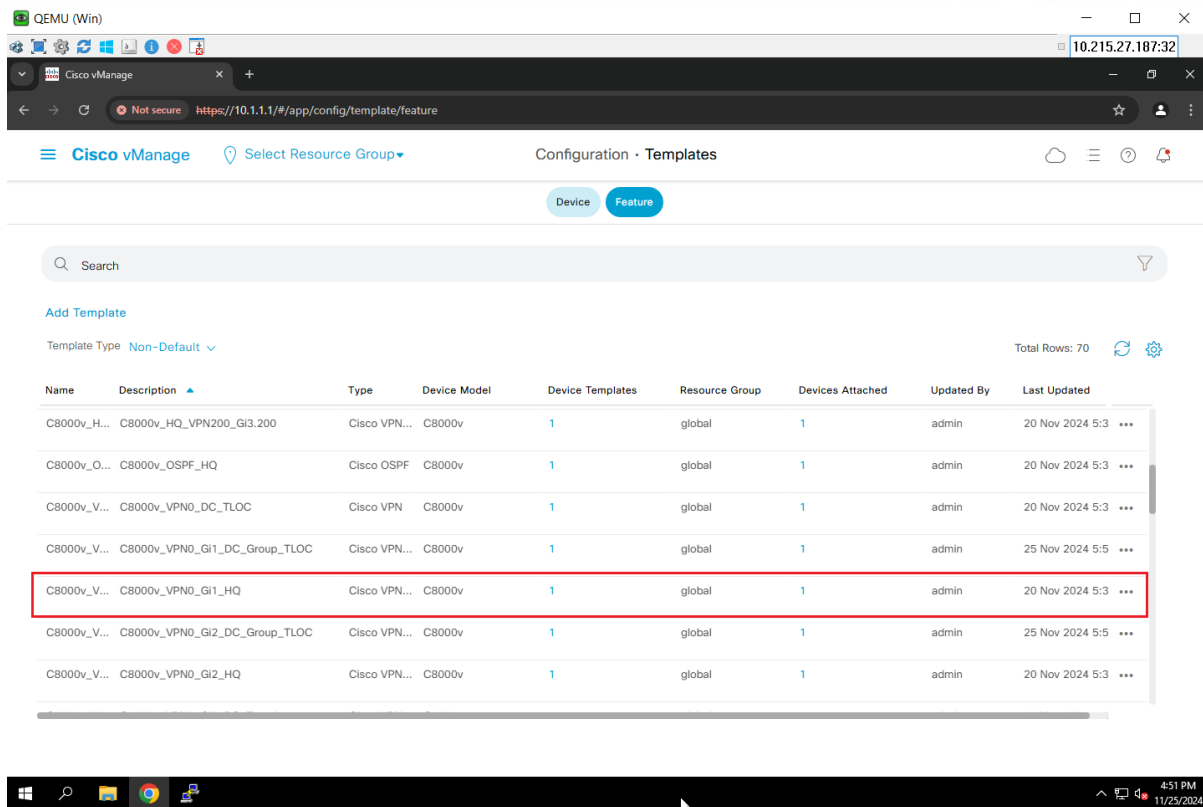


Thực hiện viết Static Nat

Ở giao diện vManager chọn vào Configuration và sau đó chọn vào Templates và chọn vào Feature



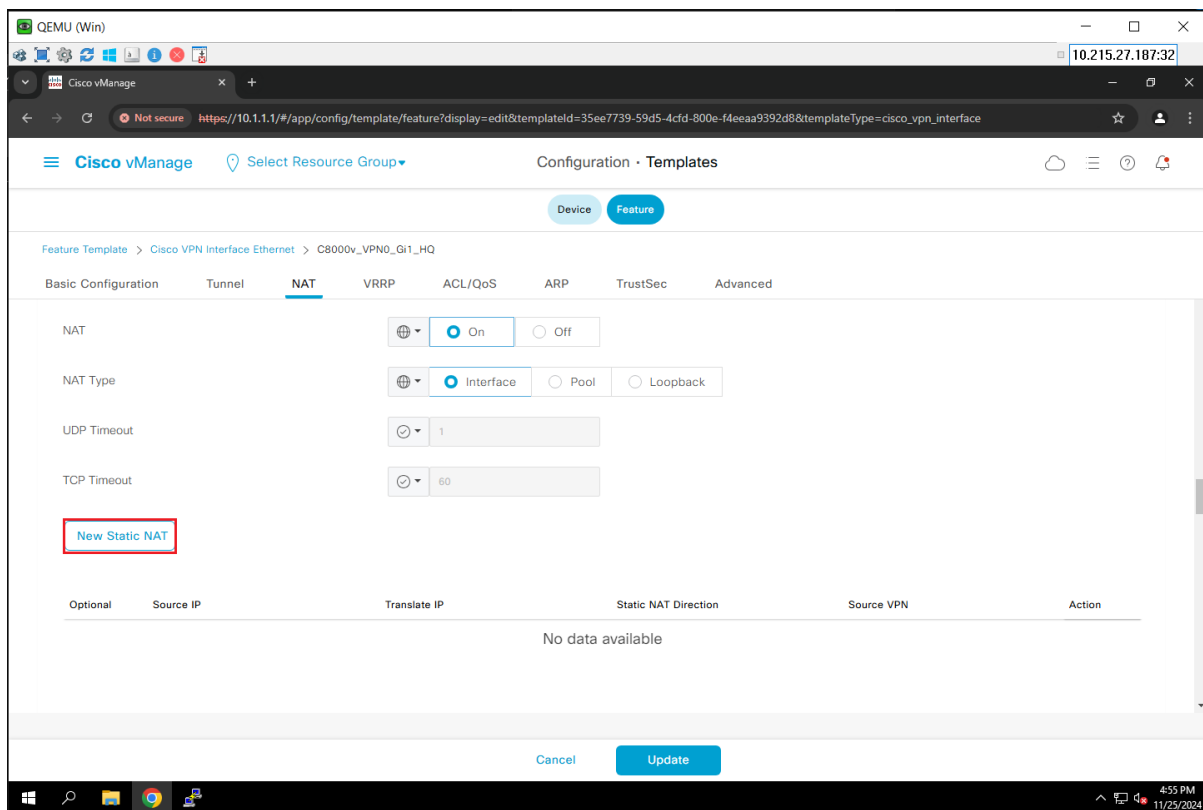
Thực hiện chỉnh sửa Feature Template C8000v_VPN0_Gi1_HQ. Chọn vào dấu ba chấm và chọn vào Edit.



The screenshot shows the Cisco vManage web interface. The top navigation bar includes the Cisco vManage logo and a 'Select Resource Group' dropdown. The main header indicates the current view is 'Configuration · Templates'. Below this, there are tabs for 'Device' and 'Feature', with 'Feature' being the active tab. A search bar is present. The main content area displays a table of templates. The table has columns for Name, Description, Type, Device Model, Device Templates, Resource Group, Devices Attached, Updated By, and Last Updated. One row is highlighted with a red border.

Name	Description	Type	Device Model	Device Templates	Resource Group	Devices Attached	Updated By	Last Updated
C8000v_H...	C8000v_HQ_VPN200_Gi3.200	Cisco VPN...	C8000v	1	global	1	admin	20 Nov 2024 5:3
C8000v_O...	C8000v_OSPF_HQ	Cisco OSPF	C8000v	1	global	1	admin	20 Nov 2024 5:3
C8000v_V...	C8000v_VPN0_DC_TLOC	Cisco VPN	C8000v	1	global	1	admin	20 Nov 2024 5:3
C8000v_V...	C8000v_VPN0_Gi1_DC_Group_TLOC	Cisco VPN...	C8000v	1	global	1	admin	25 Nov 2024 5:5
C8000v_V...	C8000v_VPN0_Gi1_HQ	Cisco VPN...	C8000v	1	global	1	admin	20 Nov 2024 5:3
C8000v_V...	C8000v_VPN0_Gi2_DC_Group_TLOC	Cisco VPN...	C8000v	1	global	1	admin	25 Nov 2024 5:5
C8000v_V...	C8000v_VPN0_Gi2_HQ	Cisco VPN...	C8000v	1	global	1	admin	20 Nov 2024 5:3

Ở phần Nat chọn vào New Static NAT



The screenshot shows the Cisco vManage web interface for configuring a NAT feature template. The top navigation bar is the same as the previous screenshot. The main header indicates the current view is 'Configuration · Templates'. Below this, there are tabs for 'Device' and 'Feature', with 'Feature' being the active tab. The breadcrumb trail shows 'Feature Template > Cisco VPN Interface Ethernet > C8000v_VPN0_Gi1_HQ'. The main content area displays the 'NAT' configuration page. The 'NAT' section has a toggle switch set to 'On'. The 'NAT Type' section has three radio buttons: 'Interface' (selected), 'Pool', and 'Loopback'. The 'UDP Timeout' and 'TCP Timeout' sections have input fields with values '1' and '60' respectively. A red box highlights the 'New Static NAT' button. Below this, there is a table for 'Optional' configurations with columns for Source IP, Translate IP, Static NAT Direction, Source VPN, and Action. The table currently shows 'No data available'.

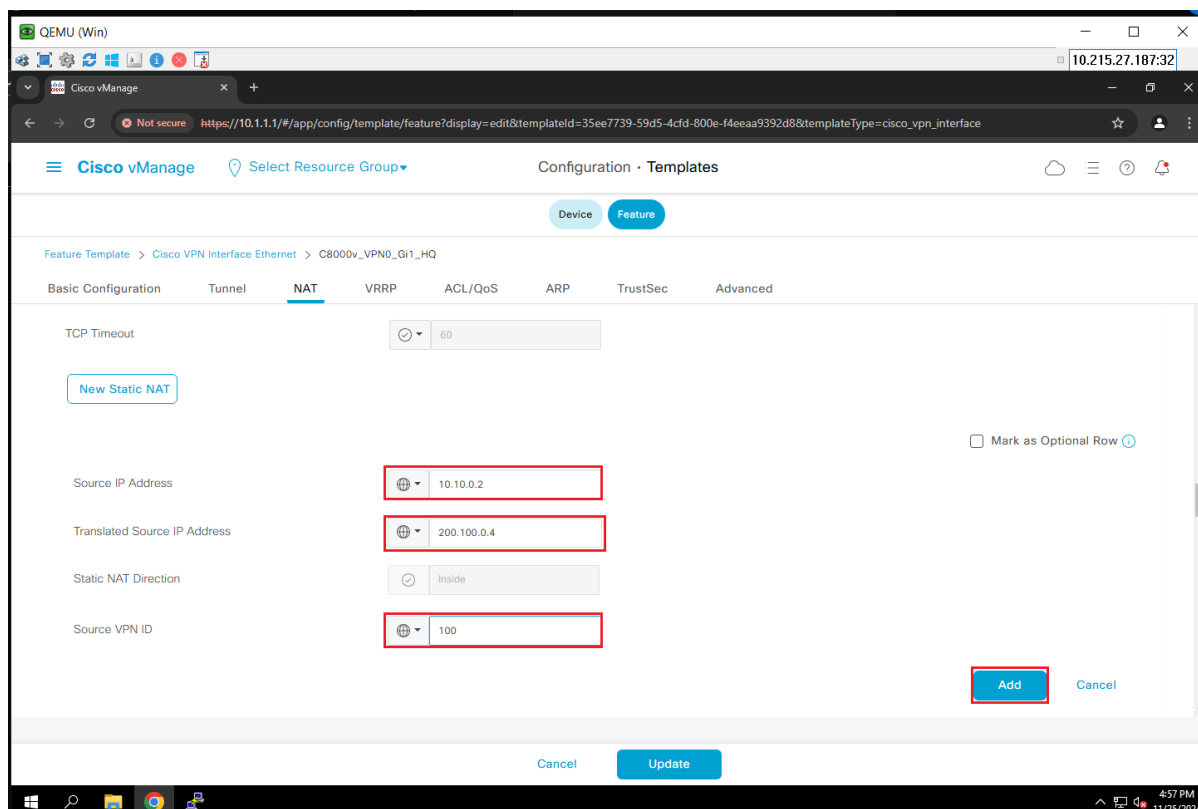
Điền các thông số sau:

Source IP Address: 10.10.0.2

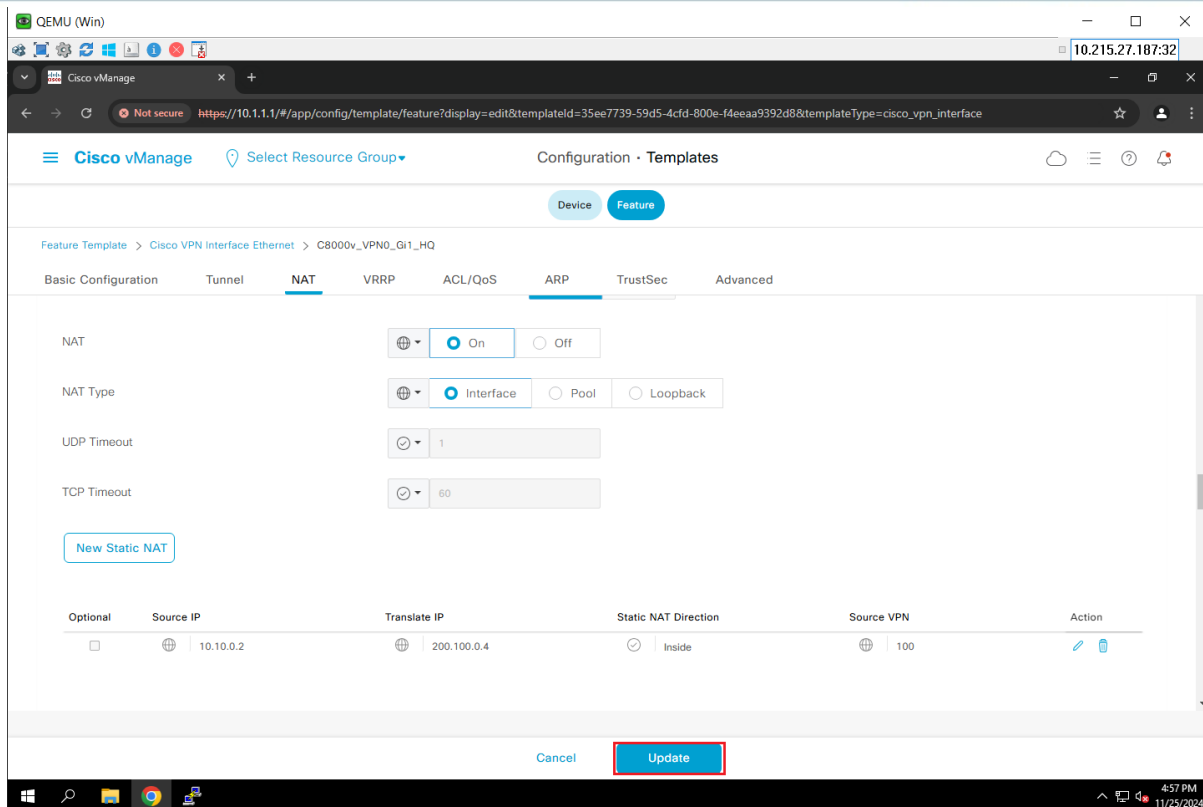
Translated Source IP Address: 200.100.0.4

Source VPN ID: chọn vào Global và điền vào 100

Sau đó chọn vào Add



Chọn tiếp vào Update để cập nhật Feature Template C8000v_VPN0_Gi1_HQ

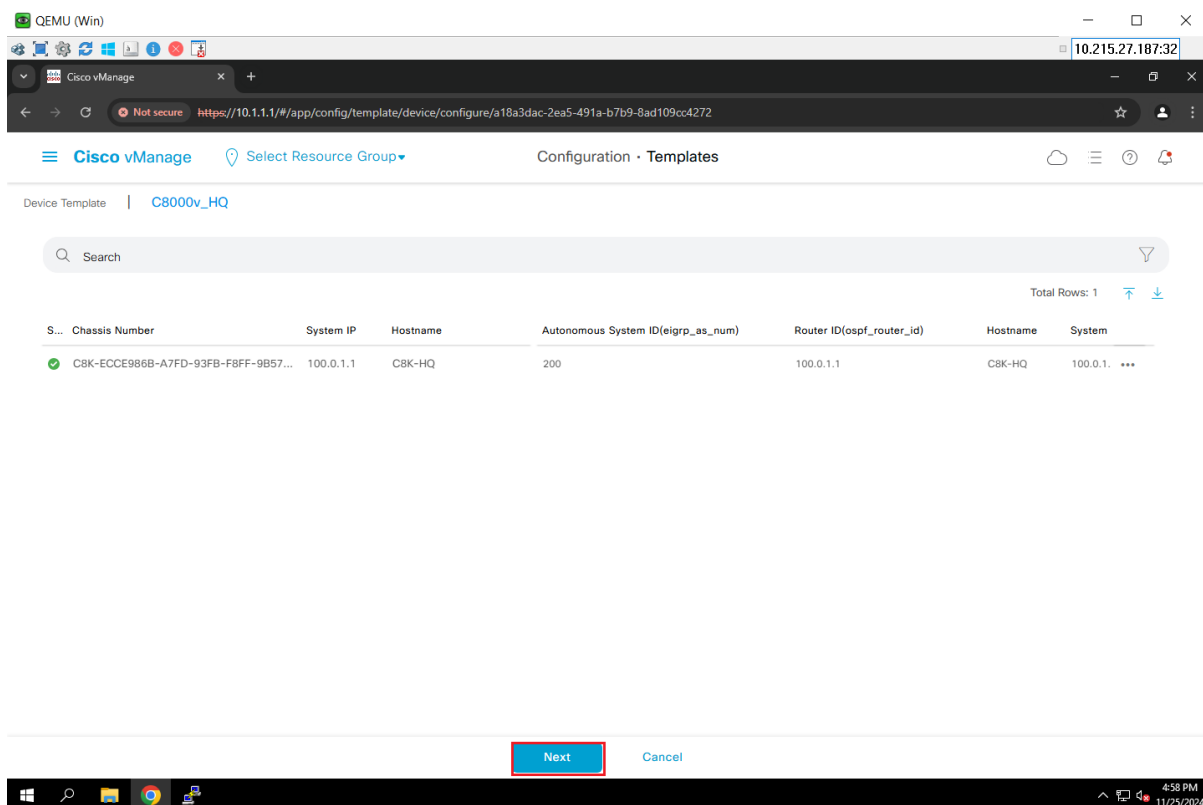


The screenshot shows the Cisco vManage interface for configuring a NAT template. The breadcrumb trail is: Feature Template > Cisco VPN Interface Ethernet > C8000v_VPN0_Gi1_HQ. The 'NAT' tab is selected, showing options for NAT (On), NAT Type (Interface), UDP Timeout (1), and TCP Timeout (60). A table below shows a static NAT configuration:

Optional	Source IP	Translate IP	Static NAT Direction	Source VPN	Action
<input type="checkbox"/>	10.10.0.2	200.100.0.4	Inside	100	Edit Delete

At the bottom, there are 'Cancel' and 'Update' buttons. The 'Update' button is highlighted with a red box.

Chọn vào Next

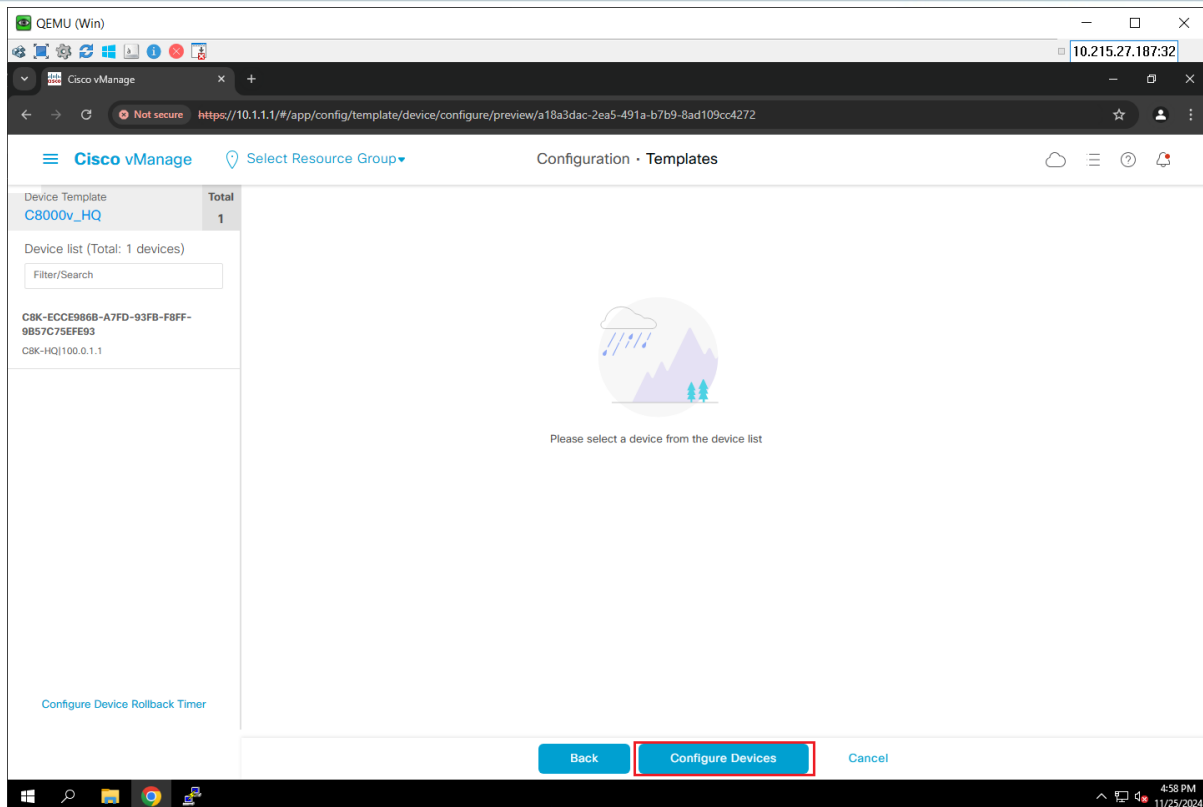


The screenshot shows the Cisco vManage interface for configuring a device template. The breadcrumb trail is: Device Template | C8000v_HQ. A search bar is present. Below it, a table shows the configuration details for the device template:

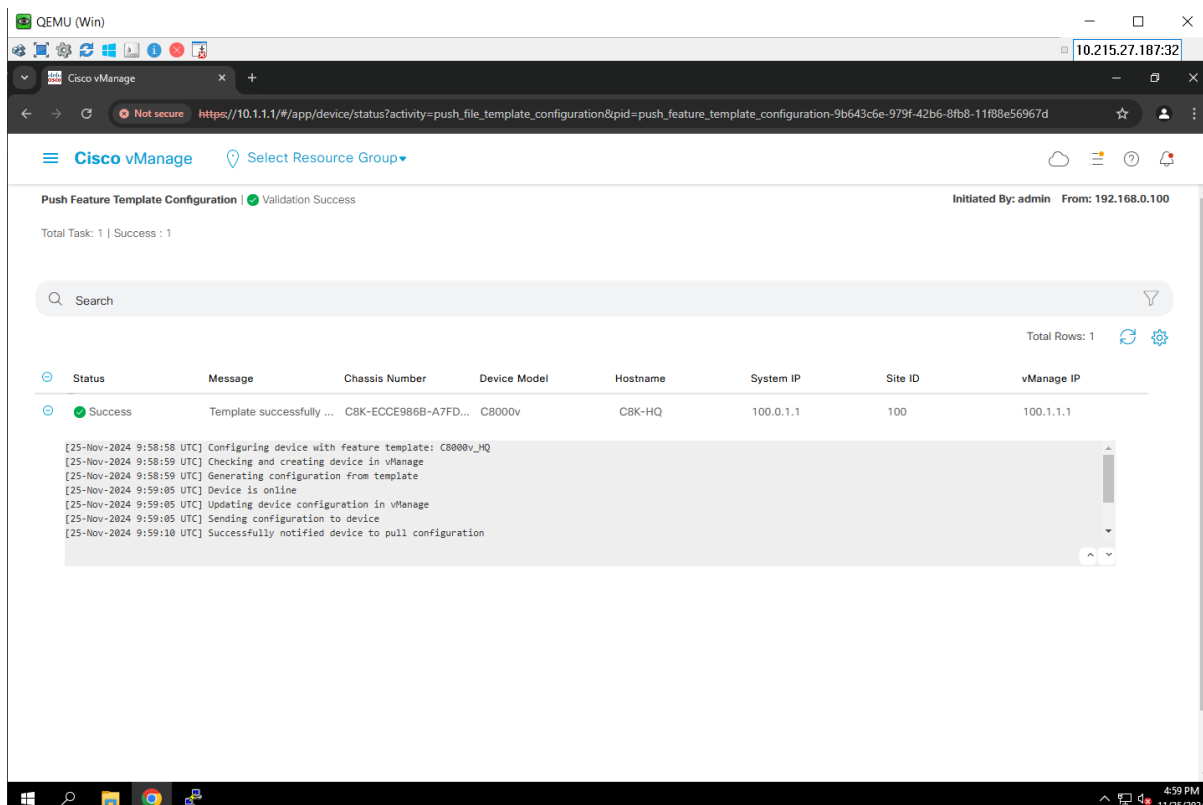
S...	Chassis Number	System IP	Hostname	Autonomous System ID(eigrp_as_num)	Router ID(ospf_router_id)	Hostname	System
✓	CBK-ECC986B-A7FD-93FB-F8FF-9B57...	100.0.1.1	CBK-HQ	200	100.0.1.1	CBK-HQ	100.0.1. ...

At the bottom, there are 'Next' and 'Cancel' buttons. The 'Next' button is highlighted with a red box.

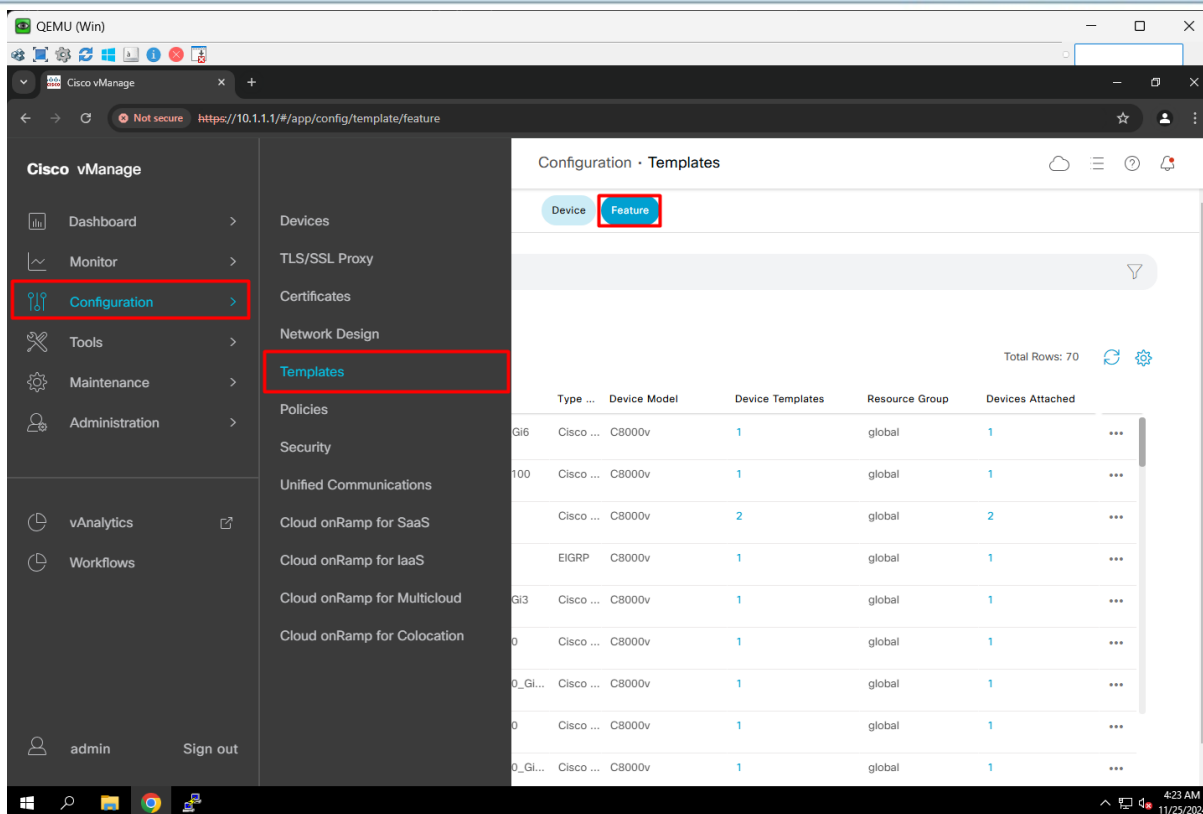
Chọn tiếp Configure Devices



Chờ vài phút sau khi chọn vào Success thì đã Attach Device thành công.



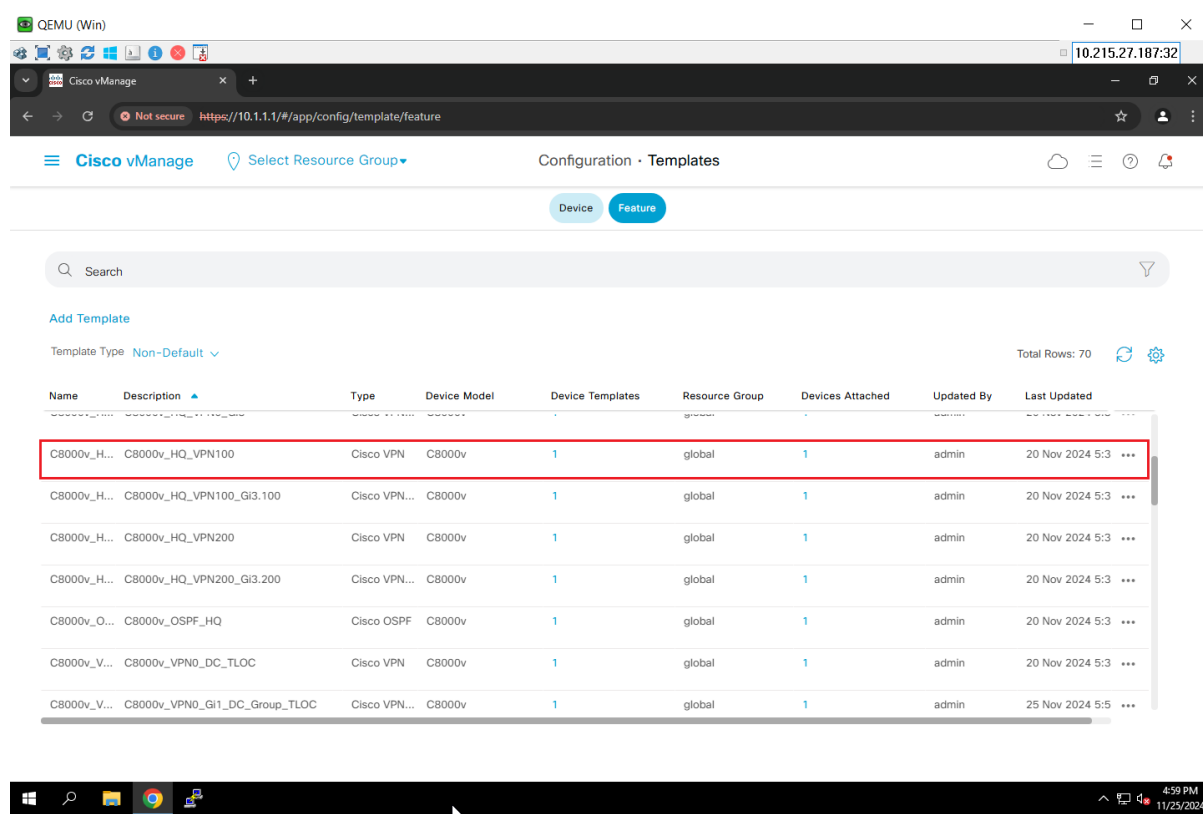
Configuration và sau đó chọn vào Templates và chọn vào Feature



The screenshot shows the Cisco vManage web interface. The left sidebar contains the navigation menu with 'Configuration' and 'Templates' highlighted. The main content area displays the 'Configuration - Templates' page, which includes a table of device templates. The table has columns for Type, Device Model, Device Templates, Resource Group, and Devices Attached. The table lists 10 rows of data, including various Cisco device models like C8000v and C8000v, with their respective resource groups and device counts.

Type	Device Model	Device Templates	Resource Group	Devices Attached
Gi6	Cisco ... C8000v	1	global	1
100	Cisco ... C8000v	1	global	1
	Cisco ... C8000v	2	global	2
	EIGRP C8000v	1	global	1
Gi3	Cisco ... C8000v	1	global	1
	Cisco ... C8000v	1	global	1
0_Gi...	Cisco ... C8000v	1	global	1
	Cisco ... C8000v	1	global	1
0_Gi...	Cisco ... C8000v	1	global	1
	Cisco ... C8000v	1	global	1

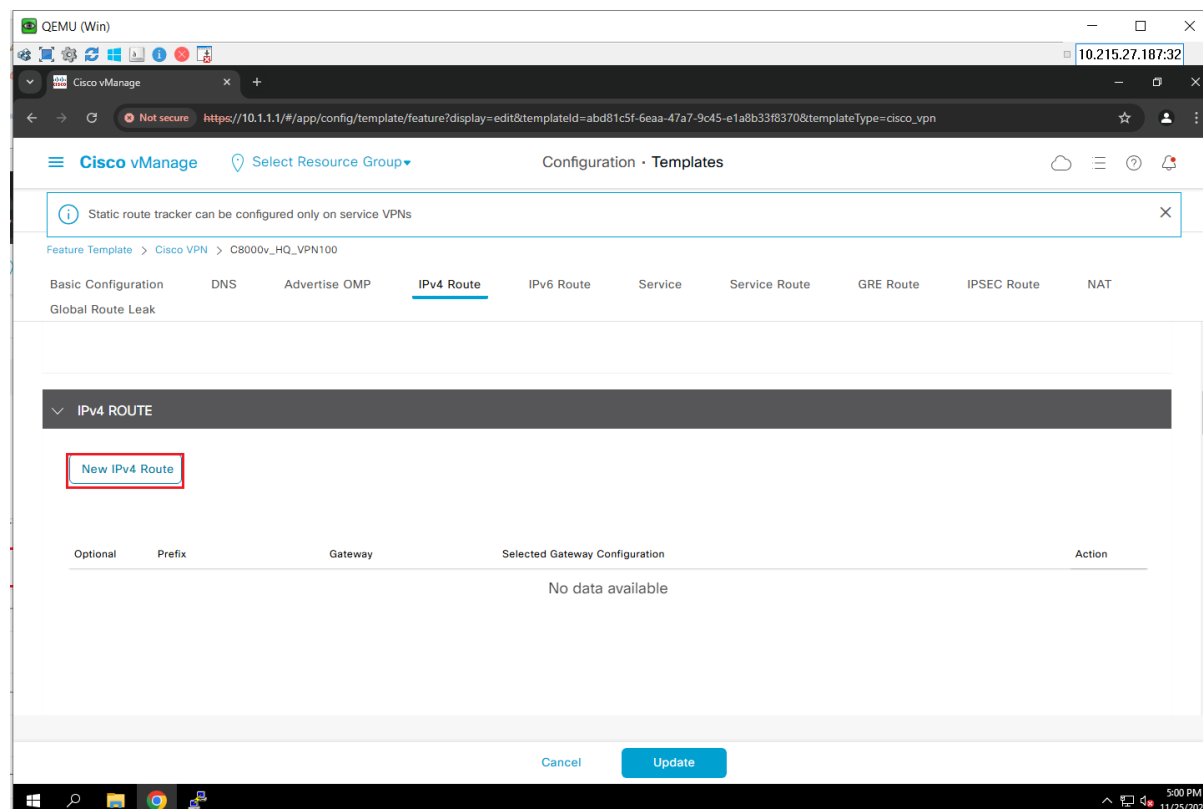
Thực hiện Edit Template C8000v_HQ_VPN100. Chọn vào dấu ba chấm và chọn vào Edit.



The screenshot shows the Cisco vManage Configuration - Templates page. The 'Feature' tab is selected. A search bar is at the top. Below it, a table lists templates. The template 'C8000v_HQ_VPN100' is highlighted with a red box. The table has columns: Name, Description, Type, Device Model, Device Templates, Resource Group, Devices Attached, Updated By, and Last Updated.

Name	Description	Type	Device Model	Device Templates	Resource Group	Devices Attached	Updated By	Last Updated
C8000v_HQ_VPN100	C8000v_HQ_VPN100	Cisco VPN	C8000v	1	global	1	admin	20 Nov 2024 5:3
C8000v_HQ_VPN100_Gi3.100	C8000v_HQ_VPN100_Gi3.100	Cisco VPN...	C8000v	1	global	1	admin	20 Nov 2024 5:3
C8000v_HQ_VPN200	C8000v_HQ_VPN200	Cisco VPN	C8000v	1	global	1	admin	20 Nov 2024 5:3
C8000v_HQ_VPN200_Gi3.200	C8000v_HQ_VPN200_Gi3.200	Cisco VPN...	C8000v	1	global	1	admin	20 Nov 2024 5:3
C8000v_OSPF_HQ	C8000v_OSPF_HQ	Cisco OSPF	C8000v	1	global	1	admin	20 Nov 2024 5:3
C8000v_VPN0_DC_TLOC	C8000v_VPN0_DC_TLOC	Cisco VPN	C8000v	1	global	1	admin	20 Nov 2024 5:3
C8000v_VPN0_Gi1_DC_Group_TLOC	C8000v_VPN0_Gi1_DC_Group_TLOC	Cisco VPN...	C8000v	1	global	1	admin	25 Nov 2024 5:5

Ở Phần IPv4 ROUTE chọn vào New IPv4 Route



The screenshot shows the Cisco vManage Configuration - Templates page, specifically the 'IPv4 ROUTE' configuration page. A message at the top states: 'Static route tracker can be configured only on service VPNs'. The 'IPv4 ROUTE' section is expanded, and the 'New IPv4 Route' button is highlighted with a red box. Below this, there is a table with columns: Optional, Prefix, Gateway, Selected Gateway Configuration, and Action. The table is currently empty, showing 'No data available'.

Ở phần IPv4 ROUTE: Prefix điền 0.0.0.0/0 và Gateway chọn vào VPN

Ở phần IPv4 ROUTE: Enable VPN chọn và Global và chọn vào On sau đó chọn vào Add

The screenshot shows the Cisco vManage Configuration - Templates page for the C8000v_HQ_VPN100 template. The IPv4 Route tab is selected. The configuration fields are as follows:

- Prefix: 0.0.0.0/0
- Gateway: ☐ Next Hop ☐ Null 0 ☒ VPN ☐ DHCP
- Enable VPN: ☒ On ☐ Off

The Add button is highlighted in red.

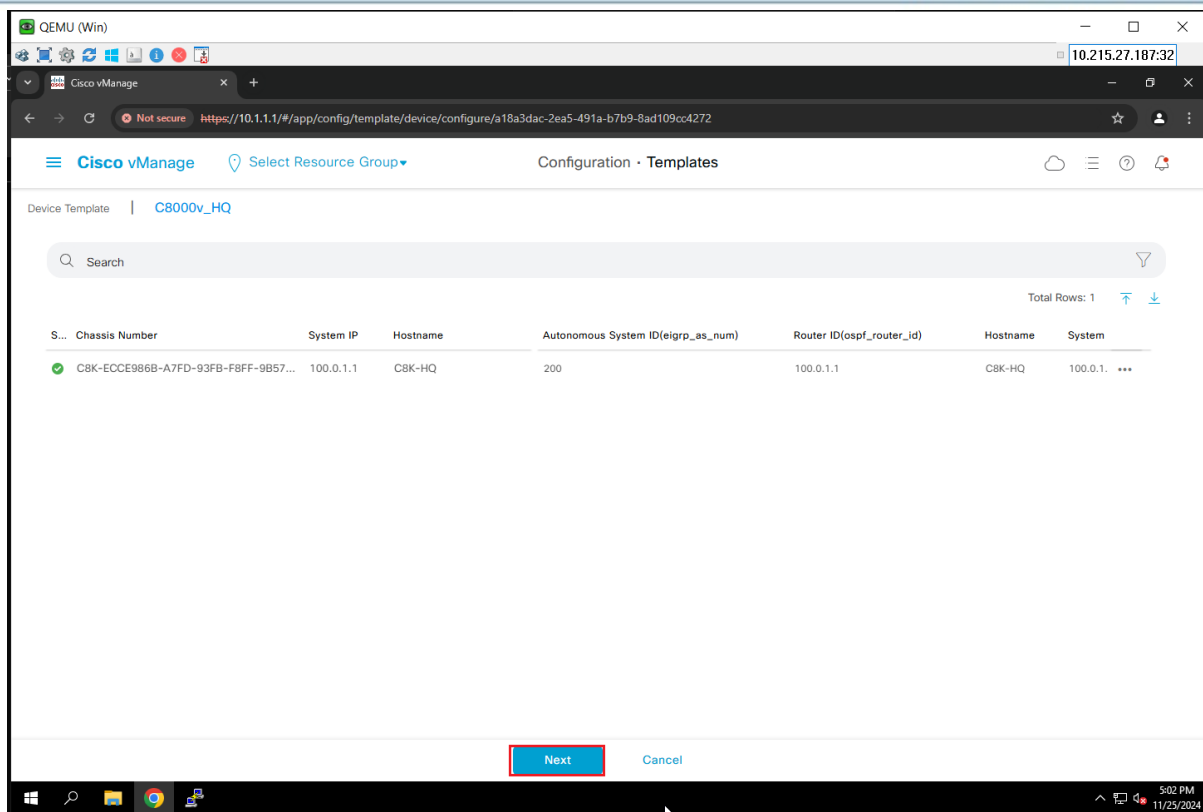
Chọn vào Update để cập nhật Template C8000v_HQ_VPN100.

The screenshot shows the Cisco vManage Configuration - Templates page for the C8000v_HQ_VPN100 template. The IPv4 Route tab is selected. The configuration table is as follows:

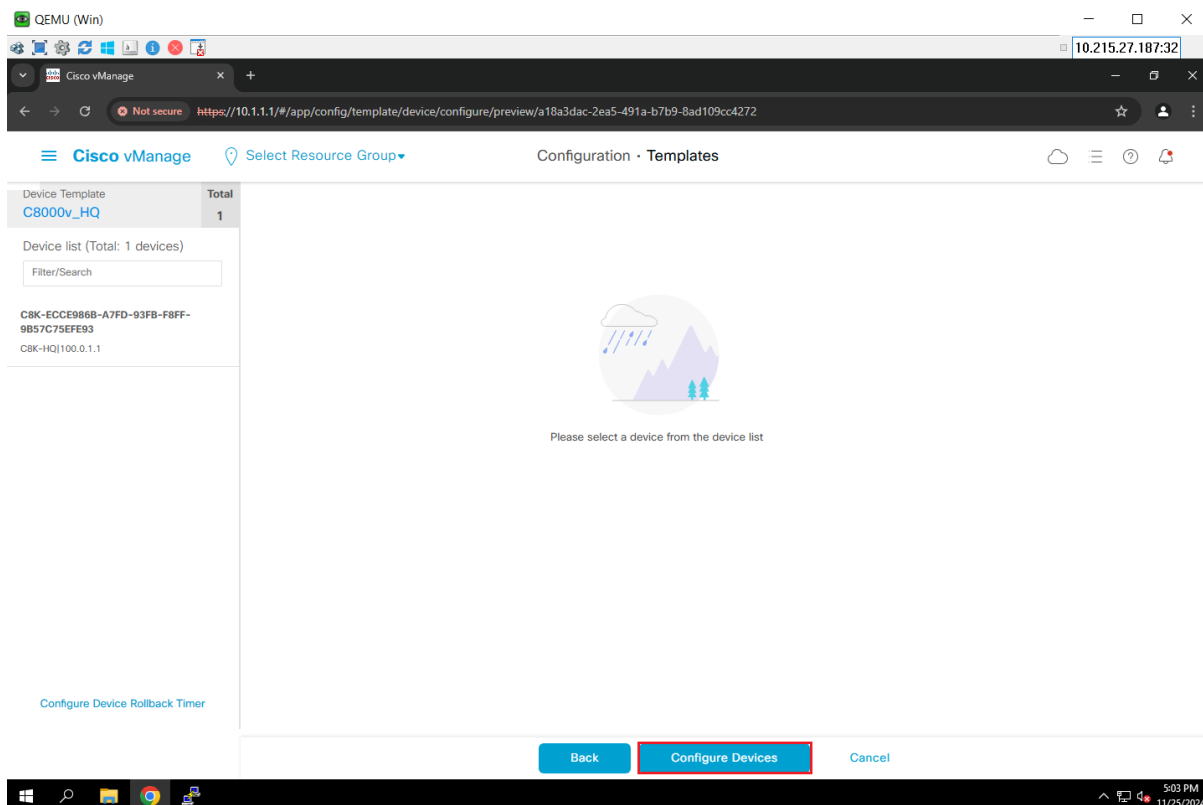
Optional	Prefix	Gateway	Selected Gateway Configuration	Action
<input type="checkbox"/>	0.0.0.0/0	VPN	Enable VPN	Edit Delete

The Update button is highlighted in red.

Chọn vào Next



Chọn vào Configure Devices



Chờ vài phút sau khi hiện trạng thái Success thành đã Attach Device thành công.

The screenshot shows the Cisco vManage web interface. The top navigation bar includes the Cisco vManage logo and a 'Select Resource Group' dropdown. The main content area displays a 'Push Feature Template Configuration' status page. The status is 'Success' with a green checkmark. Below the status, there is a table with columns: Status, Message, Chassis Number, Device Model, Hostname, System IP, Site ID, and vManage IP. The table contains one row with the following data:

Status	Message	Chassis Number	Device Model	Hostname	System IP	Site ID	vManage IP
Success	Template successfully ...	C8K-ECC986B-A7FD...	C8000v	C8K-HQ	100.0.1.1	100	100.1.1.1

Below the table, there is a log of events showing the configuration push process, including messages like 'Configuring device with feature template: C8000v_HQ', 'Checking and creating device in vManage', 'Generating configuration from template', 'Device is online', 'Updating device configuration in vManage', 'Sending configuration to device', and 'Successfully notified device to pull configuration'.

Thực hiện đặt ip 10.10.0.2 cho Host-HQ-1, test ping 8.8.8.8 và truy cập youtube.com

The screenshot shows a QEMU virtual machine environment. The main window is titled 'QEMU (Host-HQ-1)'. Inside the VM, there is a terminal window titled 'cisco@host11: ~'. The terminal shows the following commands and output:

```
cisco@host11:~$ ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data:
From 8.8.8.8: icmp_seq=6 Redirect Network(New nexthop: 10.215.26.9)
64 bytes from 8.8.8.8: icmp_seq=9 ttl=113 time=32.0 ms
From 8.8.8.8: icmp_seq=10 Redirect Network(New nexthop: 10.215.26.9)
From 8.8.8.8: icmp_seq=14 Redirect Network(New nexthop: 10.215.26.9)
From 8.8.8.8: icmp_seq=16 Redirect Network(New nexthop: 10.215.26.9)
From 8.8.8.8: icmp_seq=24 Redirect Network(New nexthop: 10.215.26.9)
From 8.8.8.8: icmp_seq=28 Redirect Network(New nexthop: 10.215.26.9)
^C
--- 8.8.8.8 ping statistics ---
29 packets transmitted, 1 received, 96.5517% packet loss, time 2864ms
rtt min/avg/max/mdev = 31.978/31.978/31.978/0.000 ms
cisco@host11:~$
```

The terminal output shows that the ping command was executed, but it resulted in a high packet loss rate (96.5517%) and a significant time delay (2864ms). The user then pressed Ctrl+C to stop the ping command.

Kiểm tra nat trên C8000v_HQ với câu lệnh show ip nat translations

```
CSK-HQ#show ip nat translations
Pro  Inside global      Inside local      Outside local      Outside global
---  200.100.0.4          10.10.0.2         ---               ---
tcp   200.100.0.4:44076    10.10.0.2:44076    35.244.181.201:443 35.244.181.201:443
tcp   200.100.0.4:43958    10.10.0.2:43958    142.250.198.134:443 142.250.198.134:443
udp   200.100.0.2:5064     200.100.0.2:64543  123.123.123.123:53  123.123.123.123:53
tcp   200.100.0.4:36978    10.10.0.2:36978    142.250.197.238:443 142.250.197.238:443
tcp   200.100.0.4:47926    10.10.0.2:47926    34.160.144.191:443  34.160.144.191:443
tcp   200.100.0.4:35088    10.10.0.2:35088    142.250.196.227:443 142.250.196.227:443
tcp   200.100.0.4:53626    10.10.0.2:53626    113.171.234.24:80   113.171.234.24:80
udp   200.100.0.2:5069     200.100.0.2:27112  123.123.123.123:53  123.123.123.123:53
udp   200.100.0.4:48083    10.10.0.2:48083    123.123.123.123:53  123.123.123.123:53
tcp   200.100.0.4:49768    10.10.0.2:49768    142.250.66.35:80    142.250.66.35:80
udp   200.100.0.4:51432    10.10.0.2:51432    123.123.123.123:53  123.123.123.123:53
tcp   200.100.0.4:34998    10.10.0.2:34998    35.190.14.201:443   35.190.14.201:443
tcp   200.100.0.4:48756    10.10.0.2:48756    142.251.170.84:443  142.251.170.84:443
tcp   200.100.0.4:41156    10.10.0.2:41156    142.250.198.98:443  142.250.198.98:443
udp   200.100.0.4:60429    10.10.0.2:60429    103.199.19.135:123  103.199.19.135:123
tcp   200.100.0.4:35804    10.10.0.2:35804    34.149.100.209:443  34.149.100.209:443
tcp   200.100.0.4:54670    10.10.0.2:54670    142.250.197.14:443  142.250.197.14:443
udp   200.100.0.2:5070     200.100.0.2:59818  123.123.123.123:53  123.123.123.123:53
tcp   200.100.0.4:43206    10.10.0.2:43206    142.250.197.74:443  142.250.197.74:443
icmp  200.100.0.2:3        200.100.0.2:0      100.100.100.1:0     100.100.100.1:3
udp   200.100.0.2:5068     200.100.0.2:56530  123.123.123.123:53  123.123.123.123:53
udp   200.100.0.4:53393    10.10.0.2:53393    123.123.123.123:53  123.123.123.123:53
udp   200.100.0.4:36324    10.10.0.2:36324    123.123.123.123:53  123.123.123.123:53
tcp   200.100.0.4:59540    10.10.0.2:59540    142.250.198.118:443 142.250.198.118:443
tcp   200.100.0.4:36976    10.10.0.2:36976    142.250.197.238:443 142.250.197.238:443
tcp   200.100.0.4:53940    10.10.0.2:53940    34.107.221.82:80    34.107.221.82:80
icmp  200.100.0.4:0        10.10.0.2:0        123.123.123.123:0   123.123.123.123:0
tcp   200.100.0.4:55260    10.10.0.2:55260    142.250.71.131:443  142.250.71.131:443
tcp   200.100.0.4:53680    10.10.0.2:53680    113.171.234.24:80   113.171.234.24:80
```