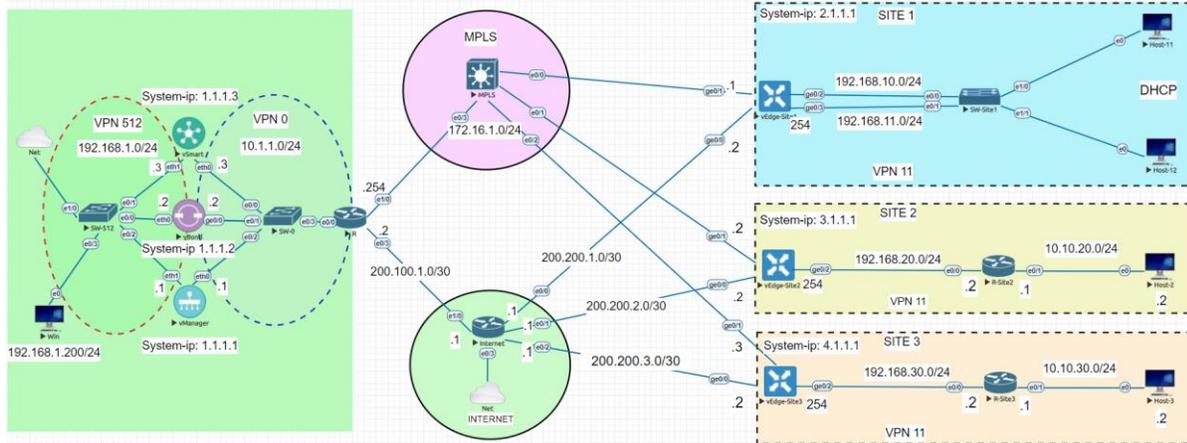


# LAB - VIẾT TEMPLATE CẤU HÌNH DHCP SERVER CHO VPN SERVICE TRONG SD-WAN

## I. Sơ đồ



## II. Yêu cầu kỹ thuật

Viết một Feature Template có tên là `vEdge_VPN11_DHCP` cấu hình DHCP Server trong giao diện vManage cho VPN 11 của vEdge ở Site 1 và hai Feature Template cho cổng `ge0/2` và cổng `ge0/3`

Viết một Device Template từ ba Feature Template trên và dùng lại các Feature Template cũ (`vEdge_VPN0`, `vEdge_VPN0_GE0/0`, `vEdge_VPN0_GE0/1`, `vEdge_VPN512`, `vEdge_VPN512_eth0`, `vEdge_VPN11`, `vEdge_OSPF`)

Kích hoạt Device Template vừa viết xong và kiểm tra các PC đã được cấp IP tự động theo yêu cầu.

## III. Các bước thực hiện

### 3.1. Viết một Template cấu hình DHCP trong giao diện vManage

Đầu tiên ta vào giao diện vManage > Configuration > Template > Feature > Add Template.

Overview

CERTIFICATE STATUS: 0 Warning

LICENSING: 0 Assigned, 3 Unassigned

REBOOT: 0 Last 24 hrs

Tunnel Health: 6 Tunnels

Tunnel	Latency (ms)
vedge3.biz-internet-vedge1.biz-internet	39.33
vedge2.biz-internet-vedge1.biz-internet	32
vedge2.biz-internet-vedge3.biz-internet	29.83
vedge1.biz-internet-vedge2.biz-internet	29.75
vedge3.biz-internet-vedge2.biz-internet	29.5

Configuration Templates

Feature Templates

Add Template

Name	Description	Type	Device Model	Device Templates	Resource Group	Devices Attached	Updated By	Last Updated
vEdge_VPN512	vEdge_VPN512	WAN Edge VPN	vEdge Cloud	1	global	0	admin	28 Jun 2023 8:1...
vSmart_VPN51...	vSmart_VPN512_eth1	vSmart Interface	vSmart	1	global	1	admin	28 Jun 2023 8:1...
vEdge_VPN512...	vEdge_VPN512_eth0	WAN Edge Inter...	vEdge Cloud	1	global	0	admin	28 Jun 2023 8:1...
vEdge_VPN11	vEdge_VPN11	WAN Edge VPN	vEdge Cloud	1	global	0	admin	28 Jun 2023 8:1...
vSmart_VPN512	vSmart_VPN512	vSmart VPN	vSmart	1	global	1	admin	28 Jun 2023 8:1...
vEdge_VPN0_G...	vEdge_VPN0_Ge0/0_Inte...	WAN Edge Inter...	vEdge Cloud	1	global	0	admin	28 Jun 2023 8:1...
vEdge_VPN0	vEdge_VPN0	WAN Edge VPN	vEdge Cloud	1	global	0	admin	28 Jun 2023 8:1...
vEdge_VPN0_G...	vEdge_VPN0_Ge0/1_MPLS	WAN Edge Inter...	vEdge Cloud	1	global	0	admin	28 Jun 2023 8:1...
vEdge_VPN11...	vEdge_VPN11_Ge0/2	WAN Edge Inter...	vEdge Cloud	1	global	0	admin	28 Jun 2023 8:1...

Ở phần Select Devices ta chọn thiết bị vEdge cloud để tạo Template DHCP Server.

The screenshot shows the Cisco SD-WAN configuration interface. The 'Templates' section is active, displaying a grid of feature templates. The 'DHCP Server' template, categorized under 'LAN', is highlighted with a red box. On the left, the 'vEdge Cloud' device type is also selected in the 'Select Devices' list.

Tiếp theo vào mục DHCP Server ta cấu hình như sau:

**Template Name:** *vEdge\_\_Site1VPN11\_DHCP*

**Description:** *vEdge\_\_Site1\_VPN11\_DHCP*

The screenshot shows the configuration page for the 'DHCP Server' template. The 'Device Type' is set to 'vEdge Cloud'. The 'Template Name\*' and 'Description\*' fields are both filled with 'vEdge\_Site1\_VPN11\_DHCP' and are highlighted with a red box. Below, the 'BASIC CONFIGURATION' section is expanded, showing fields for 'Address Pool', 'Exclude Addresses', 'Maximum Leases', and 'Lease Time (seconds)'.

Sau đó, ở **BASIC CONFIGURATION** thì mục *Address Pool* ta chọn chế độ *Device Specific* để tạo biến.

Configuration - Templates Cisco x +

← → ↻ Not secure | <https://192.168.1.1:8443/#/app/config/template/feature?display=add&deviceType=vedge-cloud&templateType=dhcp-server>

Cisco SD-WAN Select Resource Group Templates

Configuration Groups Feature Profiles Device Templates Feature Templates

Feature Template > Add Template > DHCP Server

Device Type vEdge Cloud

Template Name\* vEdge\_Site1\_VPN11\_DHCP

Description\* vEdge\_Site1\_VPN11\_DHCP

Basic Configuration Static Lease DHCP Options Advanced

▼ BASIC CONFIGURATION

Address Pool [Dropdown: Global, Device Specific] Enter Key: dhcp\_address\_pool

Exclude Addresses

Maximum Leases

Lease Time (seconds) 86400

Cancel Save

1:37 PM 6/28/2023

Ở **ADVANCED**, 2 mục *Default Gateway* và *DNS Servers* lần lượt đều chọn chế độ *Device Specific* để tạo hàm.

Configuration - Templates Cisco x +

← → ↻ Not secure | <https://192.168.1.1:8443/#/app/config/template/feature?display=add&deviceType=vedge-cloud&templateType=dhcp-server>

Cisco SD-WAN Select Resource Group Templates

Configuration Groups Feature Profiles Device Templates Feature Templates

Feature Template > Add Template > DHCP Server

▼ ADVANCED

Interface MTU [Dropdown]

Domain Name [Dropdown]

Default Gateway [Dropdown: Device Specific] [Enter Key: dhcp\_default\_gateway]

DNS Servers [Dropdown: Device Specific] [Enter Key: dhcp\_dns\_server]

TFTP Servers [Dropdown]

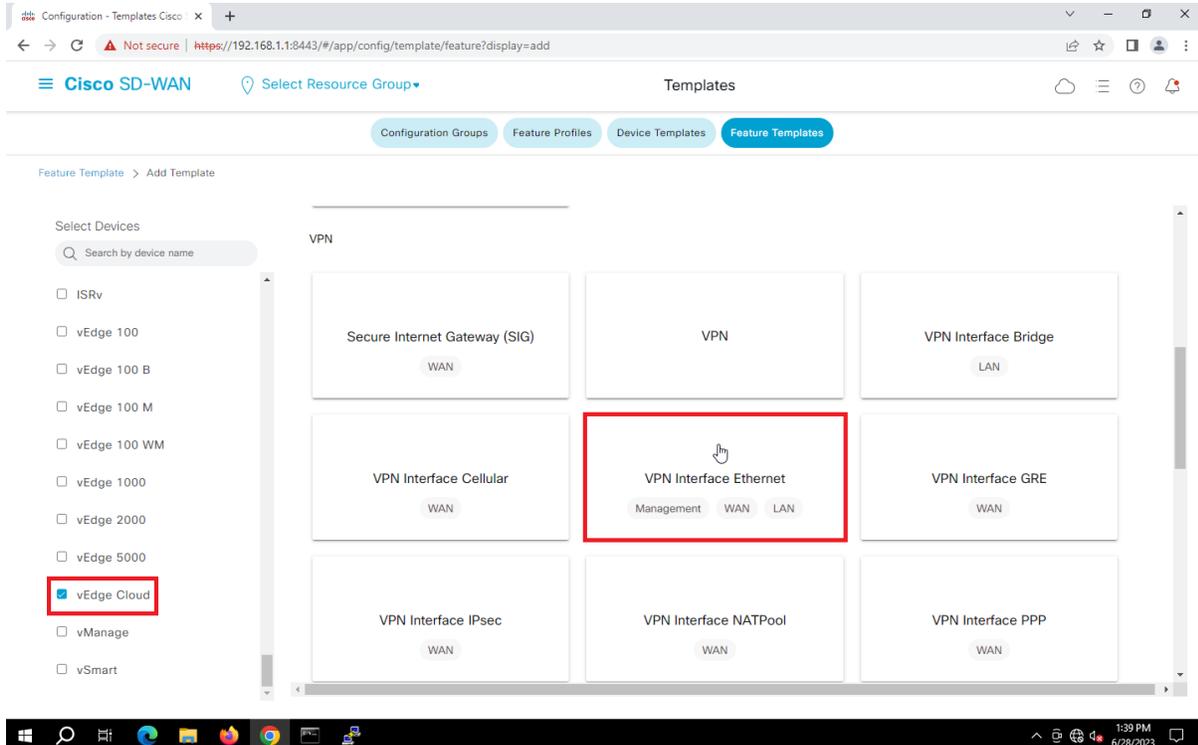
Cancel Save

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Cuối cùng, ta **Save Template**.

### 3.2. Viết một Template cấu hình các cổng ge0/3, ge0/2 trong VPN 11

Chọn **vManage > Configuration > Template > Feature > Add Template**.



Tạo template cho VPN 11 interface như bên dưới:

**Select Devices:** vEdge Cloud

**Template:** VPN/VPN Interface Ethernet

**Template Name:** vEdge\_VPN11\_Ge0/3

**Description:** vEdge\_VPN11\_Ge0/3

Configuration - Templates Cisco x +

Not secure | <https://192.168.1.1:8443/#/app/config/template/feature?display=add&deviceType=vedge-cloud&templateType=vpn-vedge-interface>

Cisco SD-WAN Select Resource Group Templates

Configuration Groups Feature Profiles Device Templates Feature Templates

Feature Template > Add Template > VPN Interface Ethernet

Device Type vEdge Cloud

Template Name\* vEdge\_VPN11\_Ge0/3

Description\* vEdge\_VPN11\_Ge0/3

Basic Configuration Tunnel NAT VRRP ACL/QoS ARP 802.1X Advanced

BASIC CONFIGURATION

Shutdown  Yes  No

Interface Name

Description

Cancel Save

Configuration - Templates Cisco x +

Not secure | <https://192.168.1.1:8443/#/app/config/template/feature?display=add&deviceType=vedge-cloud&templateType=vpn-vedge-interface>

Cisco SD-WAN Select Resource Group Templates

Configuration Groups Feature Profiles Device Templates Feature Templates

Feature Template > Add Template > VPN Interface Ethernet

Device Type vEdge Cloud

Template Name\* vEdge\_VPN11\_Ge0/3

Description\* vEdge\_VPN11\_Ge0/3

Basic Configuration Tunnel NAT VRRP ACL/QoS ARP 802.1X Advanced

BASIC CONFIGURATION

Shutdown  Yes  No

Interface Name

Description

Cancel Save

Configuration - Templates Cisco x +

Not secure | https://192.168.1.1:8443/#/app/config/template/feature?display=add&deviceType=vedge-cloud&templateType=vpn-vedge-interface

Cisco SD-WAN Select Resource Group Templates

Configuration Groups Feature Profiles Device Templates Feature Templates

Feature Template > Add Template > VPN Interface Ethernet

IPv4 IPv6

Dynamic  Static

IPv4 Address [vpn11\_ge0/3\_if\_ipv4\_address]

Secondary IP Address (Maximum: 4)

DHCP Helper

Block Non Source IP  Yes  No

Bandwidth Upstream

Bandwidth Downstream

Cancel Save

1:42 PM 6/28/2023

Chọn **Save Template**.

### 3.3. Tạo một Device Template

Ở giao diện vManage, **Configuration > Templates** (tab Device).

Chọn **Create Template > From Feature Template**.

Chọn **Device Model (vEdge Cloud)**.

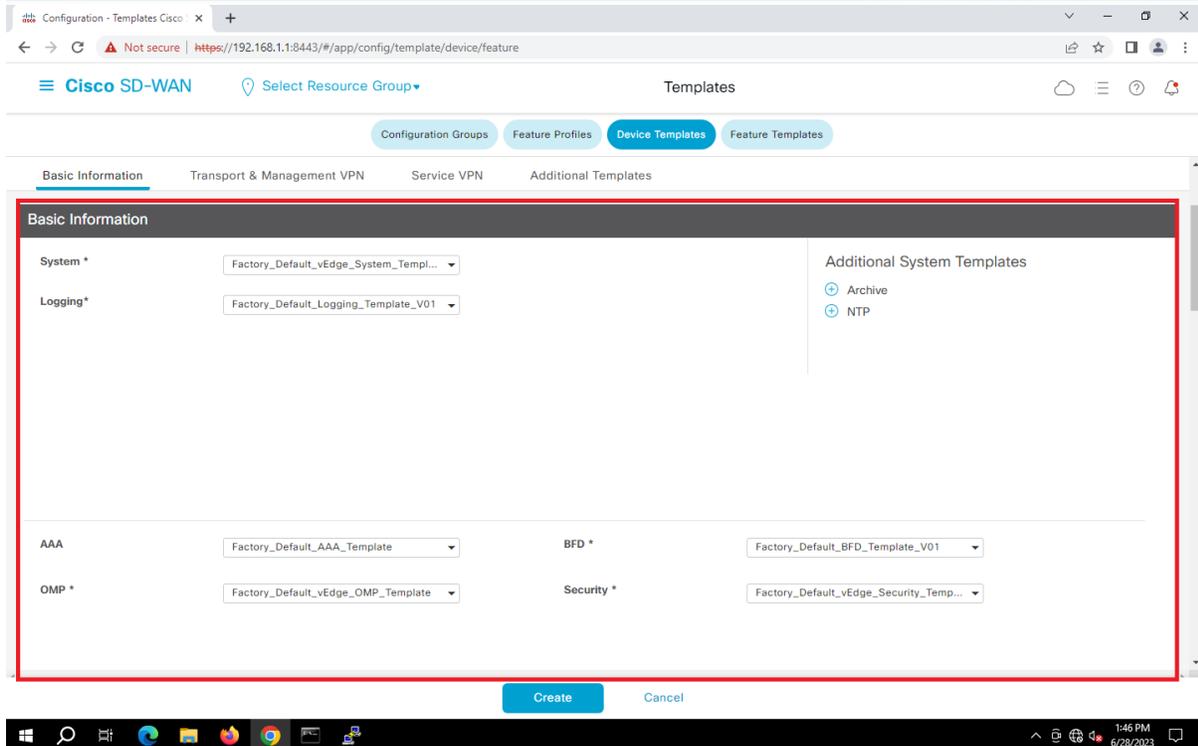
The screenshot shows the Cisco SD-WAN configuration interface. The 'Device Templates' tab is selected and highlighted with a red box. Below the search bar, a dropdown menu is open, showing 'Create Template' and 'From Feature Template' (highlighted with a red box). Below this is a table of existing templates:

Name	Description	Type	Device Mode	Device Role	Resource Group	Feature Templates	Draft Mode	Devices Attached	Updated By	Last Updated
vEdge...	vEdge_OSPF	Feature	vEdge Cloud	SDWAN Edge	global	14	Disabled	3	admin	28 Jun 2023 8:2...
vSmar...	vSmart_Template	Feature	vSmart	SDWAN Edge	global	9	Disabled	1	admin	28 Jun 2023 8:2...

Nhập **Template Name** (vEdge\_Site1\_Dual\_Network), **Description** (vEdge\_Site1\_Dual\_Network).

The screenshot shows the 'Create Template' form in the Cisco SD-WAN interface. The 'Device Model' dropdown is set to 'vEdge Cloud', 'Device Role' is 'SDWAN Edge', 'Template Name' is 'vEdge\_Site1\_Dual\_Network', and 'Description' is 'vEdge\_Site1\_Dual\_Network'. Below this, the 'Basic Information' section is expanded, showing 'System' and 'Logging' dropdowns. The 'Additional System Templates' section lists 'Archive' and 'NTP' as options.

Trong phần Basic Information thì để mặc định nếu có những template tương ứng thì có thể chọn vào.



The screenshot shows the Cisco SD-WAN configuration interface for 'Device Templates'. The 'Basic Information' tab is selected, showing a grid of template selection options:

- System \* (Factory\_Default\_vEdge\_System\_Templ...)
- Logging\* (Factory\_Default\_Logging\_Template\_V01)
- AAA (Factory\_Default\_AAA\_Template)
- OMP \* (Factory\_Default\_vEdge\_OMP\_Template)
- BFD \* (Factory\_Default\_BFD\_Template\_V01)
- Security \* (Factory\_Default\_vEdge\_Security\_Temp...)

On the right, 'Additional System Templates' includes 'Archive' and 'NTP'. At the bottom, the 'Create' button is highlighted in blue.

Ở Service VPN, ta lần lượt chọn các template tương ứng với các mục như sau:

**VPN:** vEdge\_VPN11

**VPN Interface:** vEdge\_VPN11\_GE0/2

Sau đó chọn **Sub-Templates** để hiện mục Template **DHCP Server:** vEdge\_VPN11\_DHCP

Tương tự cho cổng GE0/3

Configuration - Templates Cisco

Not secure | https://192.168.1.1:8443/#/app/config/template/device/feature

Cisco SD-WAN Select Resource Group

Templates

Configuration Groups Feature Profiles **Device Templates** Feature Templates

### Transport & Management VPN

VPN 0 \* vEdge\_VPN0

VPN Interface vEdge\_VPN0\_Ge0/0\_Internet

VPN Interface vEdge\_VPN0\_Ge0/1\_MPLS

Additional VPN 0 Templates

- BGP
- OSPF
- Secure Internet Gateway
- VPN Interface**
- VPN Interface Cellular
- VPN Interface GRE
- VPN Interface IPsec
- VPN Interface PPP

VPN 512 \* vEdge\_VPN512

VPN Interface vEdge\_VPN512\_eth0

Additional VPN 512 Templates

- VPN Interface**

Service VPN

Create Cancel

Configuration - Templates Cisco

Not secure | https://192.168.1.1:8443/#/app/config/template/device/feature

Cisco SD-WAN Select Resource Group

Templates

Configuration Groups Feature Profiles **Device Templates** Feature Templates

### Service VPN

Search

0 Rows Selected **Add VPN** Remove VPN

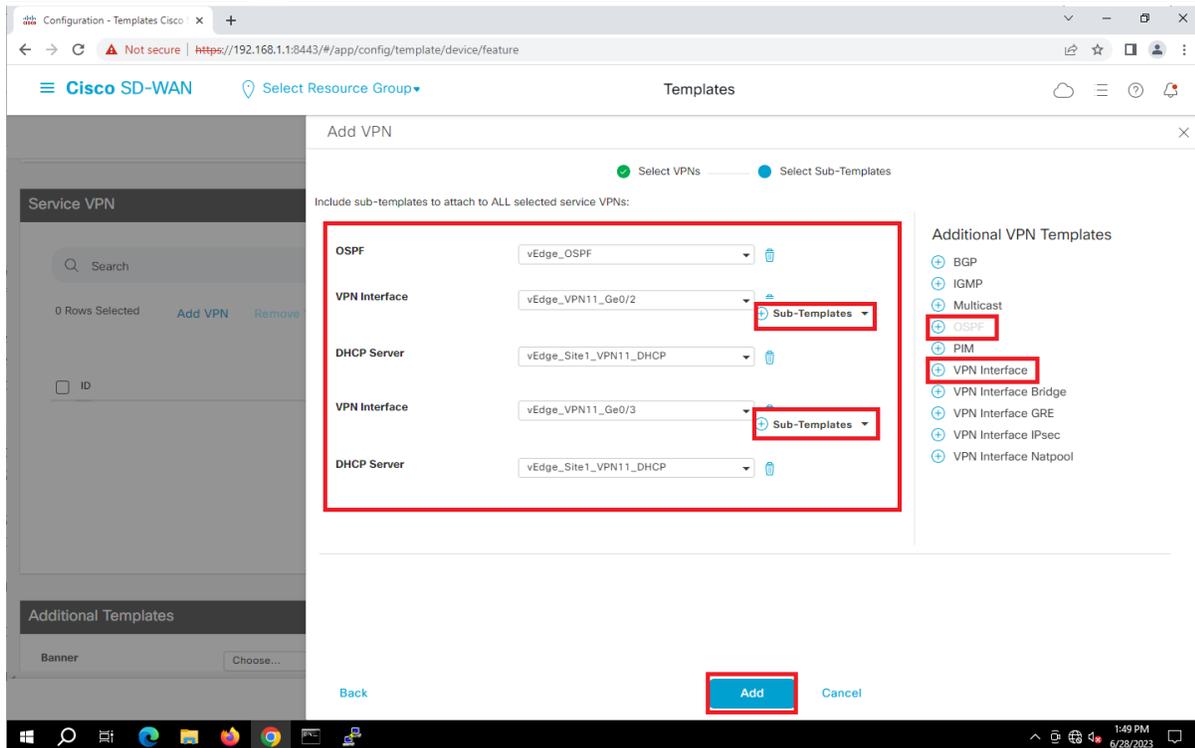
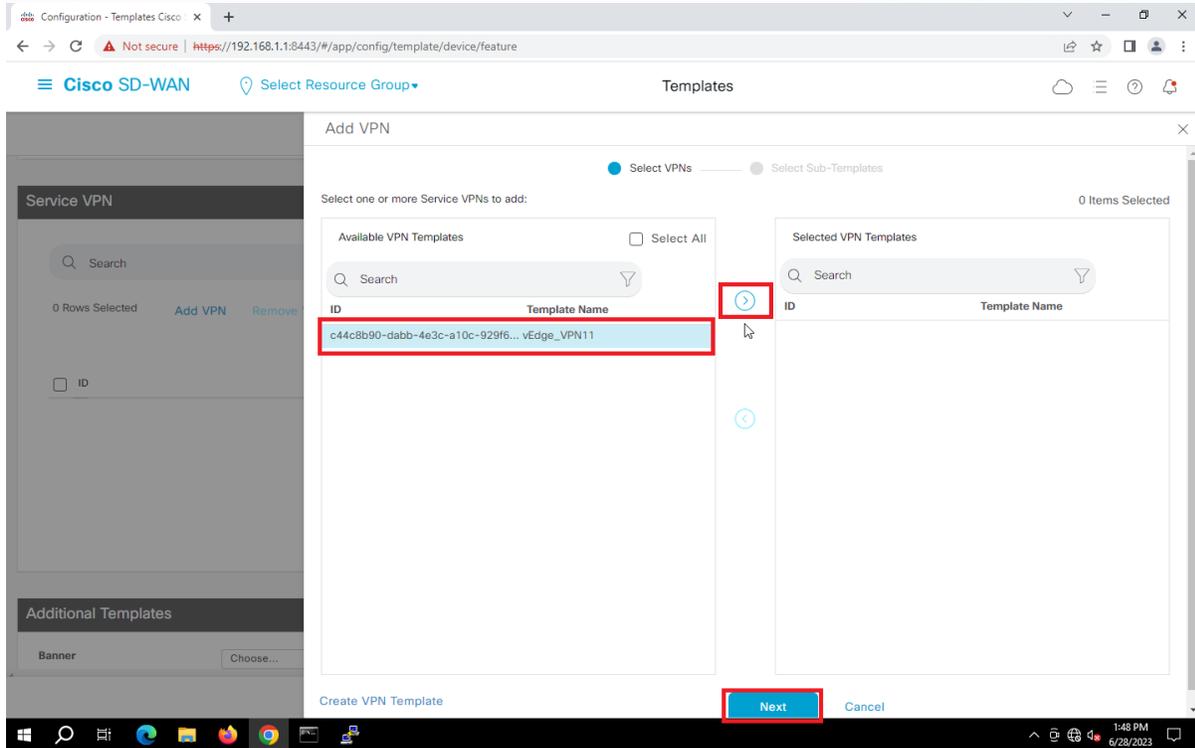
Total Rows: 0

ID	Template Name	Sub-Templates
No data available		

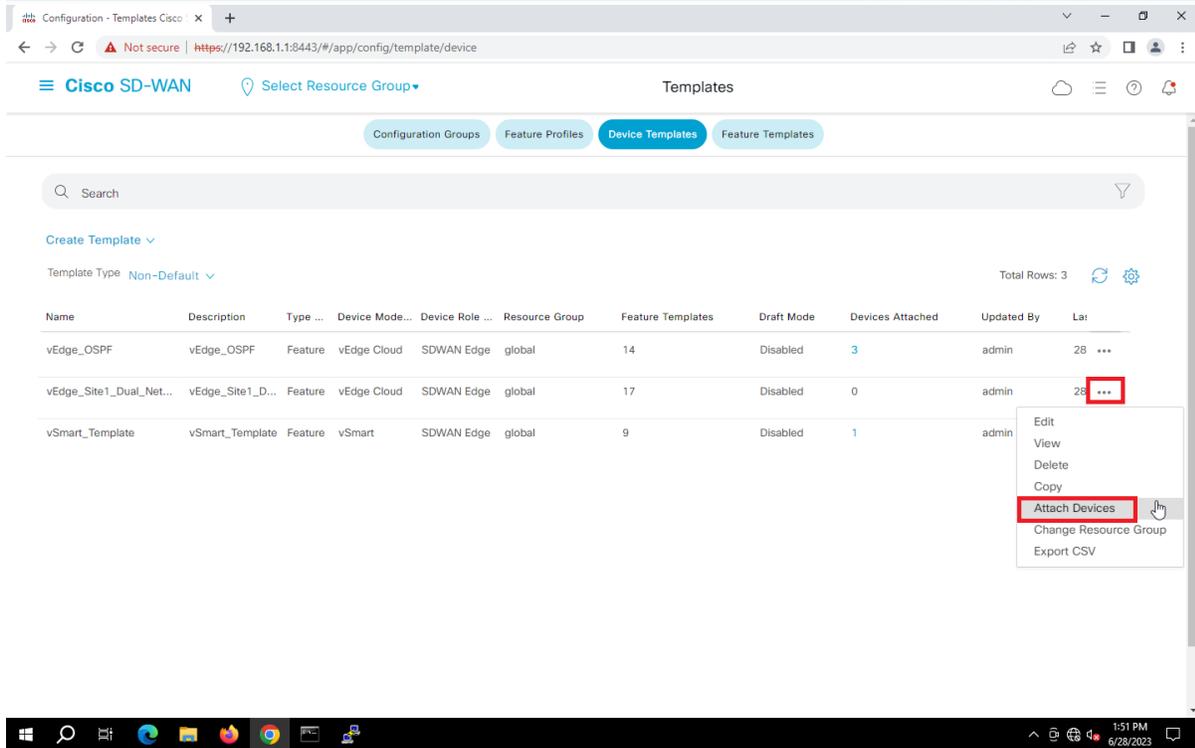
Additional Templates

Banner Choose...

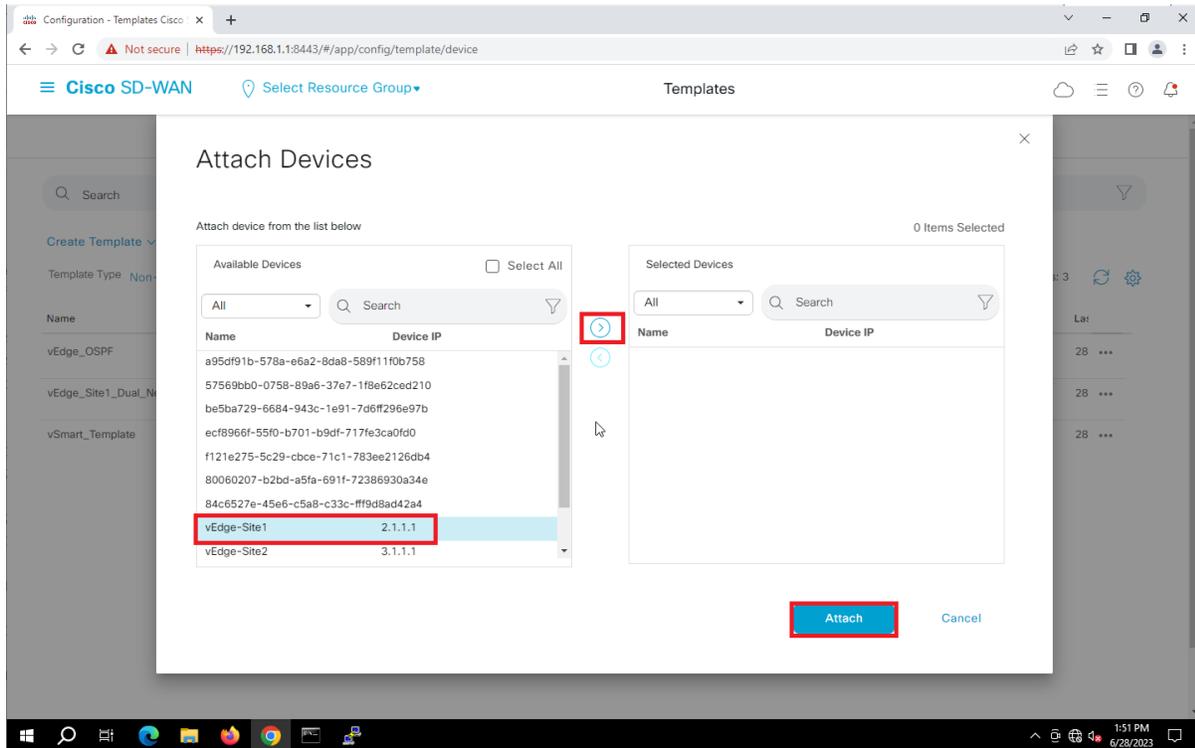
Create Cancel



**Chọn Add và Create.  
Tiến hành Attach Devices**

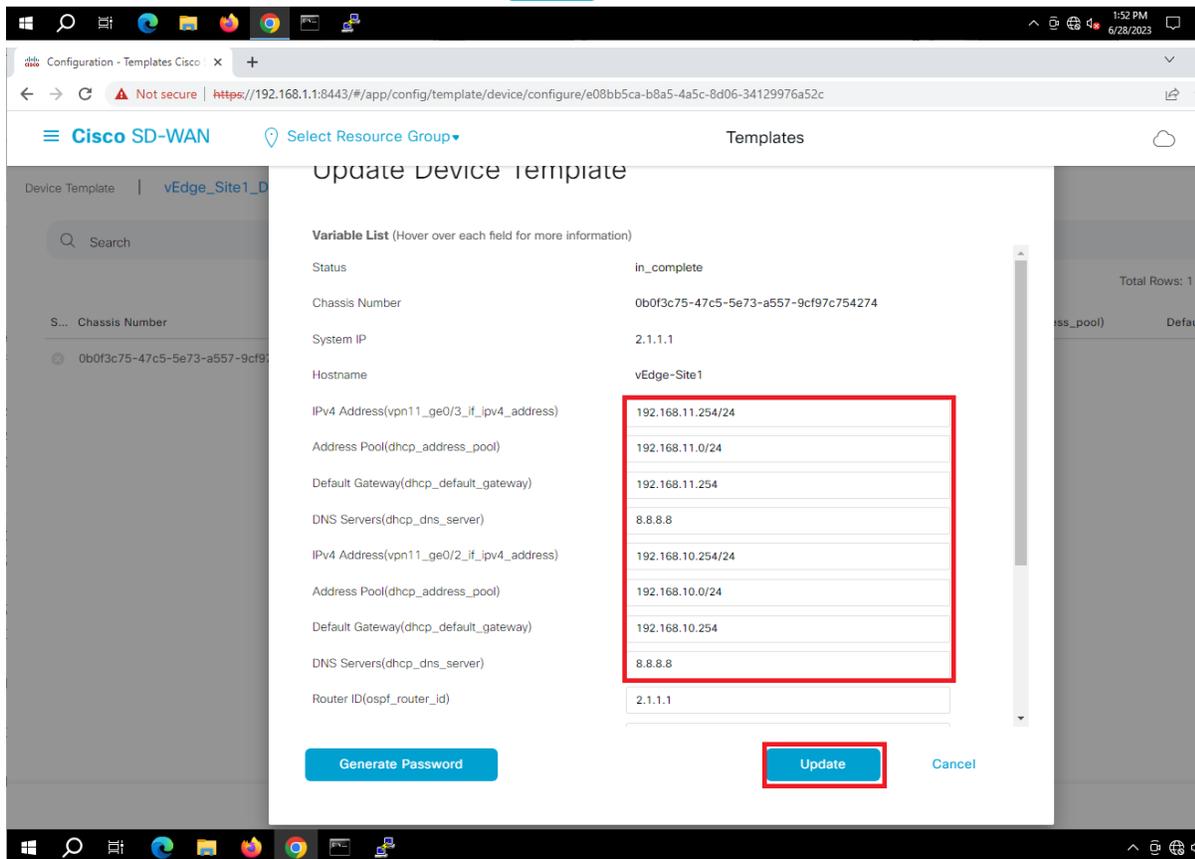
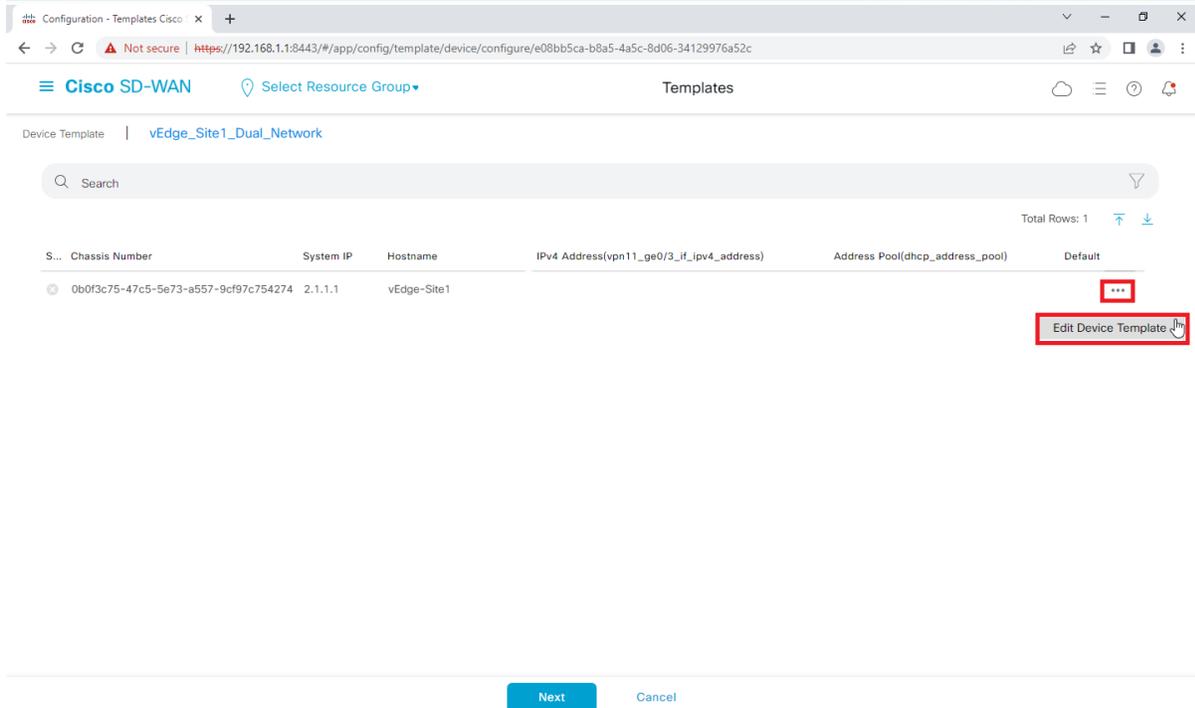


### Chọn thiết bị vEdge ở Site 1

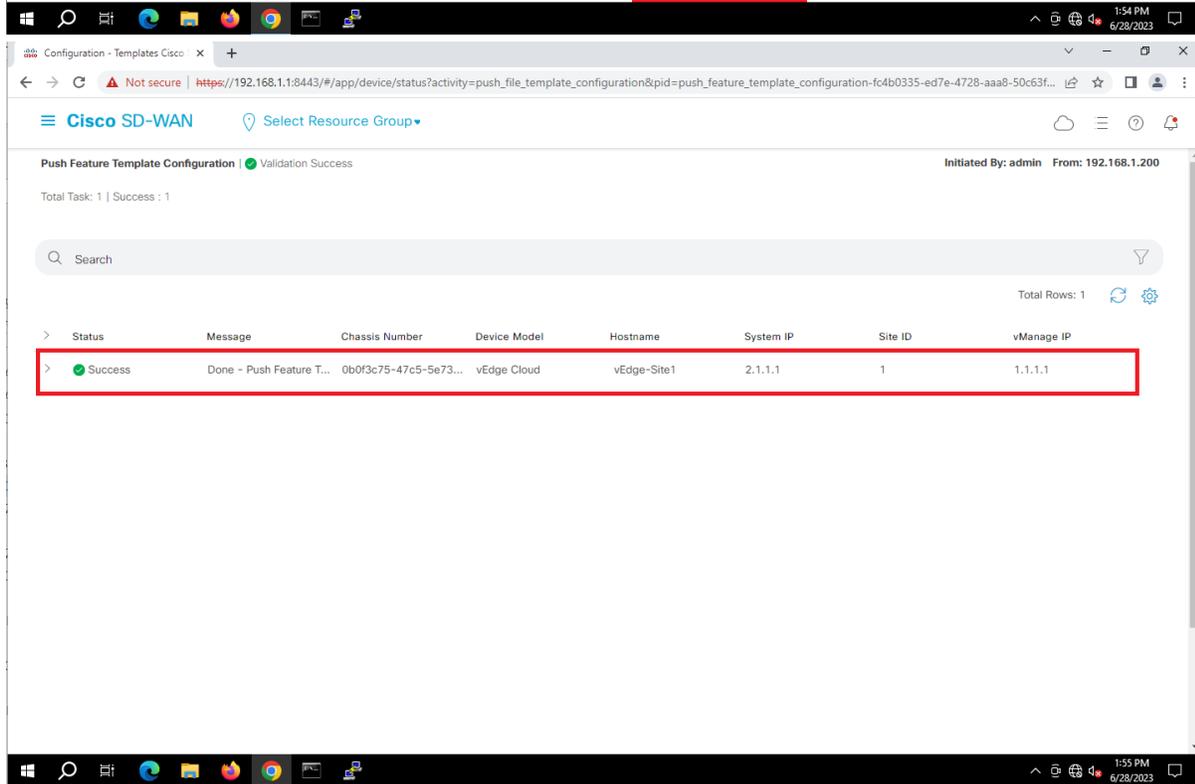
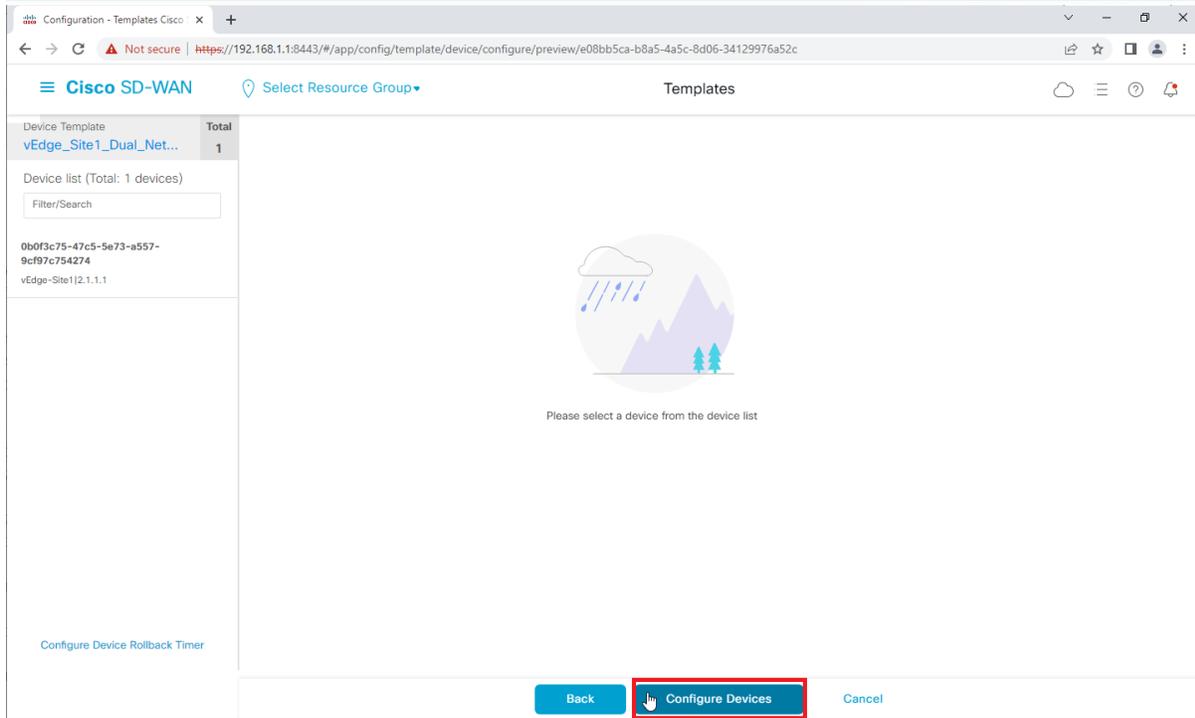


### Chọn Attach

Các thông số cấu hình cho thiết bị vEdge ở Site 1 như sau:



Chọn Update > Configure Device



Tiến hành cấu hình cho thiết bị SWITCH ở Site 1

config ter

!

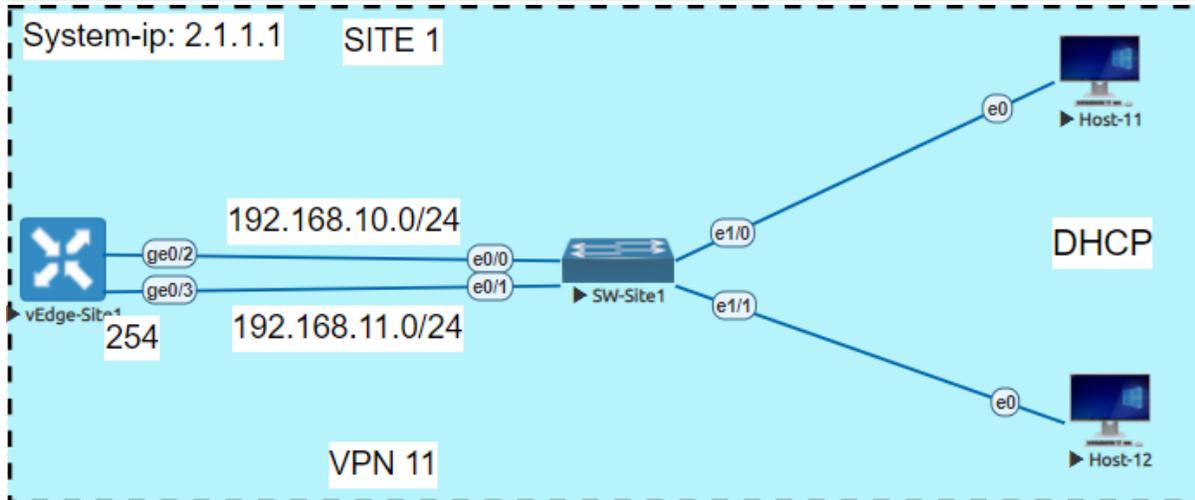
```
vlan 10
name VLAN10
!
vlan 11
name VLAN11
!
interface Ethernet0/0
switchport access vlan 10
switchport mode access
spanning-tree portfast edge
!
interface Ethernet0/1
switchport access vlan 11
switchport mode access
spanning-tree portfast edge
!
interface Ethernet1/0
switchport access vlan 10
switchport mode access
spanning-tree portfast edge
!
interface Ethernet1/1
switchport access vlan 11
switchport mode access
spanning-tree portfast edge
!
```

#### IV. Kiểm tra

Kiểm tra trên thiết bị vEdge ở site1 đã được áp cấu hình bằng lệnh *show running-config*

```
vEdge-Site1 x vEdge-Site2 vEdge-Site3 SW-Site1
interface ge0/2
 ip address 192.168.10.254/24
 no shutdown
 dhcp-server
  address-pool 192.168.10.0/24
  offer-time 600
  lease-time 86400
  admin-state up
  options
   default-gateway 192.168.10.254
   dns-servers 8.8.8.8
  !
 !
 !
interface ge0/3
 ip address 192.168.11.254/24
 no shutdown
 dhcp-server
  address-pool 192.168.11.0/24
  offer-time 600
  lease-time 86400
  admin-state up
  options
   default-gateway 192.168.11.254
   dns-servers 8.8.8.8
  !
 !
```

Tiến hành kiểm tra các PC đã được cấp địa chỉ IP theo yêu cầu



```

File Edit Tabs Help
cisco@host11:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: ens3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 00:50:00:00:04:00 brd ff:ff:ff:ff:ff:ff
    altname enp0s3
    inet 192.168.10.151/24 brd 192.168.10.255 scope global dynamic noprefixroute ens3
        valid_lft 86385sec preferred_lft 86385sec
    inet6 fe80::fe4f:8cc0:d7d0:5776/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
cisco@host11:~$
    
```

