

LAB : KỸ THUẬT LƯU LƯỢNG TRONG MẠNG SD-WAN

I. Sơ đồ



II. Yêu cầu kỹ thuật

- Thực hiện đấu nối thiết bị như sơ đồ lab.
- Tạo hai Feature Template cho dành cho Voice (VPN1: là VPN1 và VPN1_Ge0/2) và tạo hai Feature Template dành cho Data (VPN2: là VPN2 và VPN2_Ge0/3)
- Tạo một Device Template gồm bốn feature Template vừa tạo và năm Feature template cũ (vEdge_VPN0, vEdge_VPN0_Ge0/0, vEdge_VPN0_Ge0/1, vEdge_VPN512, vEdge_VPN512_eth0). Sau khi tạo xong, tiến hành đẩy cấu hình cho WAN Edge
- Tạo một Control policy dành cho lưu lượng voice và data (với voice thì sẽ giao tiếp trực tiếp với nhau là nó sẽ thiết lập mô hình full-mesh, còn với data thì nó sẽ thông qua Site 2 để lấy dữ liệu là nó sẽ thiết lập mô hình Hub and Spoke). Sau đó tiến hành kích hoạt policy tới WAN Edge.

III. Các bước thực hiện

- 3.1. Tạo hai Feature Template cho dành cho Voice (VPN1: *VPN1* và *VPN1_ Ge0/2*) và tạo hai Feature Template dành cho Data (VPN2: là *VPN2* và *vEdge_VPN2_ Ge0/3*)
- Tạo hai Feature Template cho dành cho Voice (VPN1: là *VPN1* và *VPN1_Ge0/2*)

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

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Ở phần Select Devices, hãy chọn phần vEdge Cloud > VPN để tạo service VPN1 dành cho Voice:

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Ngay sau ở phần **Basic Configuration** đó điền lần lượt như sau:

Template Name: VPN1

Description: Voice

VPN: 1

V-D-

CISCO SD-WAIN	\bigcirc	Select Resource	Group		Templa	ates			\diamond	= 0	9
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Đối với Advertise OMP, chọn *On* đối với Connected (IPv4) và Static (IPv4). Bài lab hôm nay ta sẽ dùng định tuyến tĩnh và Connected

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OSPF External	• On	O Off		
EIGRP	• On	O Off		
LISP	• On	O Off		
ISIS	• On	O Off		

Sau đó chọn Save để tạo Feature Template cho VPN1

Bây giờ, hãy tạo thêm một Feature Template cho cổng interface ge0/2 (nó là cổng của VPN1) ở phần Select Devices > vEdge Cloud > VPN Interface Ethernet



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vEdge Cloud			
vManage	VPN Interface IPsec	VPN Interface NATPool	VPN Interface PPP
vSmart			

Sau đó, ta tạo lần lượt thêm các trường như sau:

Template Name: *VPN1_Ge0/2* Description: *VPN1_Ge0/2* VPN: *1* Shutdown: *No* Interface Name: *ge0/2*

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Chọn Save để tạo xong Template mới.

• Tạo hai Feature Template cho dành cho Data (VPN2: là *VPN2* và *VPN2_G20/3*)

Sau đó, tìm phần Feature Template có tên **VPN1**, chọn copy để tạo ra một Feature Template mới đó là **VPN2**.

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	vEdge_VPN11	vEdge_VPN11_Ge0/2	WAN Edge Inter	vEdge Cloud	0	global	0	admin	11 View Edit
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Thay đổi

Template Name: VPN2

Description: Data

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Edge_VPN11	vEdge_VPN11	WAN Edge VF	Template Name					admin	11 Jul 2023 5:21	
Smart_VPN512	vSmart_VPN512	vSmart VPN	VPN2					admin	11 Jul 2023 5:21	
Edge_VPN0_G	vEdge_VPN0_Ge0/0_Inte	WAN Edge Int	Description					admin	11 Jul 2023 5:21	
Edge_VPN0	vEdge_VPN0	WAN Edge VF						admin	11 Jul 2023 5:21	
Edge_VPN0_G	vEdge_VPN0_Ge0/1_MPLS	WAN Edge Int						admin	11 Jul 2023 5:21	
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Smart_VPN0	vSmart_VPN0	vSmart VPN						admin	11 Jul 2023 5:21	
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PN1	Voice	WAN Edge VPN	vEdge Cloud	0	global	0		admin	11 Jul 2023 5:29	
PN1 Ge0/2	VPN1 Ge0/2	WAN Edge Inter	vEdge Cloud	0	alobal	0		admin	11 Jul 2023 5:31	



Bước kế, hãy chọn edit để chỉnh sửa các mục bên trong sao cho phù hợp với yêu cầu VPN2.

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vSmart_VPN512	vSmart_VPN512	vSmart VPN	vSmart	1	global	1	admin	11 Jul 2023 5:21		
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vEdge_VPN0_G	vEdge_VPN0_Ge0/1_MPLS	WAN Edge Inter	vEdge Cloud	0	global	0	admin	11 Jul 2023 5:21		
vEdge_VPN11	vEdge_VPN11_Ge0/2	WAN Edge Inter	vEdge Cloud	0	global	0	admin	11 Jul 2023 5:21		
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Tiếp tục, ta cũng tìm Feature Template *VPN1_Ge0/2*, copy để tạo ra một Feature Template mới cho cổng *ge0/3*.

TRUNG TÂM TIN HỌC VNPRO ĐC: 276 - 278 Ung Văn Khiêm, P.25, Q.Binh Thạnh, Tp Hồ Chí Minh

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Khi mà copy ta nhớ thay đổi các trường sau:

Template Name: VPN2 _Ge0/3

Description: VPN2_Ge0/3

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Edge_VPN0_G	vEdge_VPN0_Ge0/1_MPLS	WAN Edge Int						admin	11 Jul 2023 5:21		
Edge_VPN11	vEdge_VPN11_Ge0/2	WAN Edge Int						admin	11 Jul 2023 5:21		
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Sau khi đã copy thành công Feature Template mới, ta edit lại các thông số bên trong.

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DC: 276 - 278 Ung Văn Khiêm, P.25, Q.Binh Thạnh, Tp Hồ Chí Minh **DT**: (028) 35124257 | **Hotline**: 0933427079 **Email**: vnpro@vnpro.org

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vEdge_VPN0_G	vEdge_VPN0_Ge0/1_MPLS	WAN Edge Inter	vEdge Cloud	0	global	0	admin	11 Jul 2023 5:21	•••	
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3.2. Tạo một Device Template gồm bốn feature Template vừa tạo, năm Feature template cũ và đẩy cấu hình cho WAN Edge

Đầu tiên ta vào giao diện vManage > Configuration > Templates > Create Template > From Feature Template

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Create Template > From Feature Template CLI Template							Total Rows: 1	Q	錼		
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Chỉnh sửa các trường như sau:

- Device Model: vEdge Cloud
- Template Name: vEdge Voice Data
- Description: vEdge Voice Data

E Cisco SD-WAN	♦ Select Resource Group		Templat	es		\bigcirc	\equiv	0	
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Ở mục Transport & Management VPN, dùng lại các Template cũ (VPN0, VPN512)

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Đối với mục Service VPN, ta sẽ dùng các Template mới tạo đó là:

VPN: VPN1 VPN Interface: VPN1_Ge0/2

VPN: VPN2

VPN Interface: VPN2_Ge0/3

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Chọn Create để tạo xong Device Template.

Ta thực hiện đẩy cấu hình cho WAN Edge bằng cách, tìm device template mới tạo xong, chọn ... > Attach Devices để đẩy cấu hình.

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vEdge vEdge_Voice Feature vEdge Cloud SD	WAN Edge global 15	Disabled 0	admin 11 J	Jul 2023 5:41 •••
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Tiếp theo lựa chọn các thiết bị được đẩy cấu hình



ĐC: 276 - 278 Ung Văn Khiêm, P.25, Q.Binh Thạnh, Tp Hồ Chí Minh

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Thông số vEdge ở Site1





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168a2add-2c4f-fcb1-6139-1d99c	IPv4 Address(vpn1_ge0/2_if_ipv4_address)	192.168.1.254/24	
	Address(vpn0_Internet_next_hop_ip_address_1)	200.200.1.1	
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Thông số vEdge ở Site2

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Thông số vEdge ở Site3



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168a2add-2c4f-fcb1-6139-1d990	IPv4 Address(vpn1_ge0/2_if_ipv4_address)	192.168.5.254/24	
	Address(vpn0_Internet_next_hop_ip_address_1)	200.200.3.1	
	IPv4 Address(vpn0_ge0/1_MPLS_if_ipv4_address)	172.16.1.3/24	
	IPv4 Address(vpn0_ge0/0_Internet_if_ipv4_address)	200.200.3.2/30	
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S Chassis Number	System IP Hostname	IPv4 Address(vpn2_ge0/3_if_ipv4_address)	IPv4 Address(vpn1_ge0/2_if_ipv4_address)	
Ob0f3c75-47c5-5e73-a557-9cf97c754274	2.1.1.1 vEdge-Site1	192.168.2.254/24	192.168.1.254/24	•••
S316bef9-7742-d0c9-1048-df6288bb4e	3.1.1.1 vEdge-Site2	192.168.4.254/24	192.168.3.254/24	•••
168a2add-2c4f-fcb1-6139-1d99df86e22e	4.1.1.1 vEdge-Site3	192.168.6.254/24	192.168.5.254/24	•••
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Tiếp theo chọn Configure Devices



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DC: 276 - 278 Ung Văn Khiêm, P.25, Q.Binh Thạnh, Tp Hồ Chí Minh **D**T: (028) 35124257 | **Hotline:** 0933427079 **Email:** vnpro@vnpro.org

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Configure Device Rollback Timer				
		Back Configure Devices	Cancel	
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Kết quả Success.

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>	Success	Done - Push Feature T	0b0f3c75-47c5-5e73	vEdge Cloud	vEdge-Site1	2.1.1.1	1	1.1.1.1			
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Đối với các Router trong sơ đồ lab, ta cấu hình CLI như sau.



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R-Site1-Voice:





R-Site2-Voice

interface Ethernet0/0 ip address 192.168.3.2 255.255.255.0 no shutdown !

ip route 192.168.1.0 255.255.255.0 192.168.7.254

ip route 192.168.5.0 255.255.255.0 192.168.7.254

R-Site3-Voice

interface Ethernet0/0

ip address 192.168.5.2 255.255.255.0

no shutdown

```
!
```

ip route 192.168.1.0 255.255.255.0 192.168.4.254

ip route 192.168.3.0 255.255.255.0 192.168.4.254

R-Site1-Data

!

interface Ethernet0/0

ip address 192.168.2.2 255.255.255.0

no shutdown

!

ip route 192.168.4.0 255.255.255.0 192.168.8.254

```
ip route 192.168.6.0 255.255.255.0 192.168.8.254
```

R-Site2-Data

interface Ethernet0/0 ip address 192.168.4.2 255.255.255.0 no shutdown ! ip route 192.168.2.0 255.255.255.0 192.168.3.254 ip route 192.168.6.0 255.255.255.0 192.168.3.254



R-Site3-Data

interface Ethernet0/0	
ip address 192.168.6.2 255.255.255.0	
!	
ip route 192.168.2.0 255.255.255.0 192.168.9.254	
ip route 192.168.4.0 255.255.255.0 192.168.9.254	

3.3. Tạo một Control policy dành cho lưu lượng voice và data và kích hoạt policy Đầu tiên ta vào giao diện vManage > Configuration > Policy > Centralized Policy > Add Policy





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Ở mục Prefix > New Prefix List để tạo lần lượt các mục sau:

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elect a list type on the left and sta	irt creating your group	os of interest					
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ata Prefix olicer	Site1_Data	192.168.2.0/24	IPv4	0	admin	11 Jul 2023 6:39:10 PM +07	<i>l</i> c
refix	Site1_Voice	192.168.1.0/24	IPv4	0	admin	11 Jul 2023 6:38:56 PM +07	0
ite	Site2_Data	192.168.4.0/24	IPv4	0	admin	11 Jul 2023 6:39:54 PM +07	0 0
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LOC	Site3_Data	192.168.6.0/24	IPv4	0	admin	11 Jul 2023 6:40:26 PM +07	<i>l</i> c
PN	Site3_Voice	192.168.5.0/24	IPv4	0	admin	11 Jul 2023 6:40:14 PM +07	/ 6
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Ở TLOC tạo ra ba *Tloc* cho ba site.

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Name: Traffic_Engineering



Description: Traffic_Engineering

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Hãy thiết lập:



Match Conditions: Prefix List: *Site2_Data* Actions: Accept Match Conditions: Prefix List: *Site1_Data* Actions: Accept: TLOC List: *Tloc_Site2* Match Conditions: Prefix List: *Site3_Data* Actions: Accept: TLOC List: *Tloc_Site2*

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Chon Sequence Type > TLOC

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Ở mục Default Action, ta sẽ chọn Actions là Accept

Cancel

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Chọn Next, Next để tới Add policies to sites and VPNs

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Sau đó tạo tên cho policy và chọn hướng cho các Site là Outbound

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Add policies to sites and VPNs				
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opology Application-Aware Rou raffic_Engineering	ting Traffic Data Cflowd Role Ma	pping for Regions		CUSTOM CONTROL
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Chon Save Policy.

Cuối cùng ta tìm tên policy vừa tạo, chọn Activate để kích hoạt policy

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IV.Kiểm tra

Vào Router R-Site1-Voice ở Site 1 ping qua R-Site3-Voice ở Site 3

```
R-Sitel-Voice>ping 192.168.5.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.5.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 61/71/81 ms
R-Sitel-Voice>
```

Sau đó thực hiện lệnh traceroute 192.168.5.2 để xem đường đi qua R-Site3-Voice ở Site3, ta sẽ thấy nó đi thẳng qua site 3. Vì nó là voice cần trao đổi trực tiếp



Vào Router R-Site1-Data thực hiện lệnh ping sang R-Site3-Data



Sau đó thực hiện lệnh traceroute 192.168.6.2 để xem đường đi qua R-Site3-Data ở Site3, ta sẽ thấy nó đi qua site 2 rồi mới đi qua site 3. Vì nó là data cần trao đổi thông qua site 2 để trao đổi data hoặc lấy data rồi mới đến chi nhánh.



