

使用vManage功能模板配置TLOC扩展

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简介

本文档介绍如何使用vManage功能模板配置TLOC扩展。

先决条件

要求

Cisco 建议您了解以下主题：

- vManage功能模板的使用
- 两(2)台vEdge设备必须成功注册到vManage

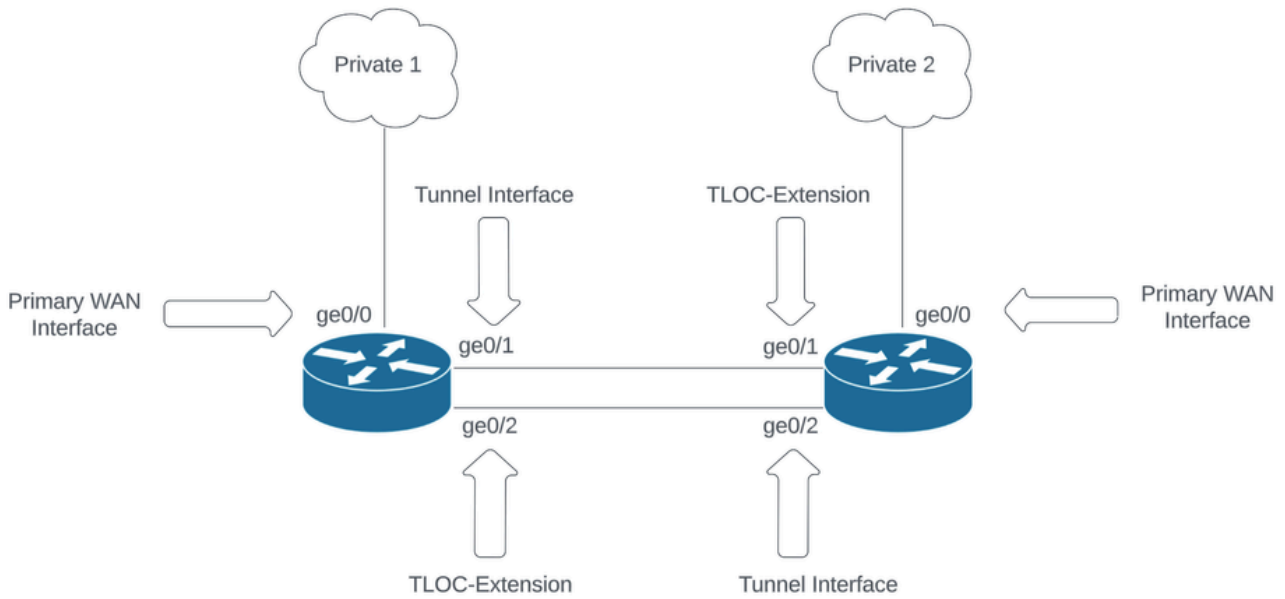
使用的组件

本文档中的信息基于以下软件和硬件版本：

- 思科vManage版本20.6.3
- vEdge 20.6.3

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您的网络处于活动状态，请确保您了解所有命令的潜在影响。

网络图



网络拓扑

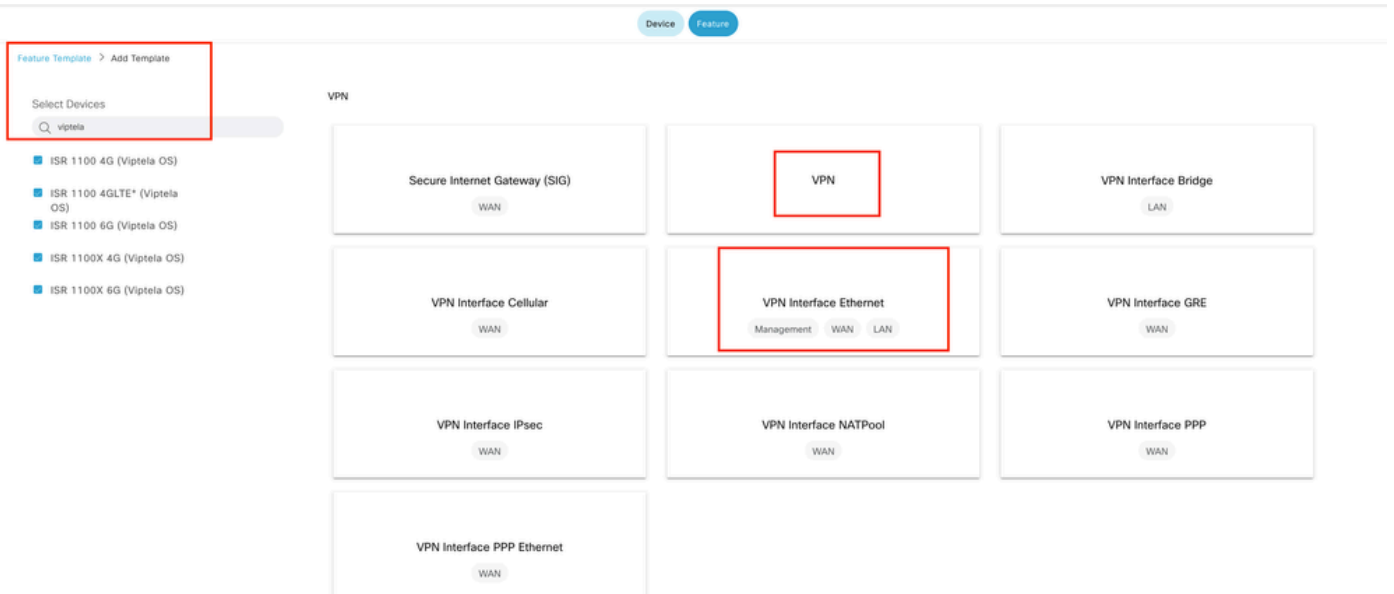
配置

本文档假定您已配置其余功能模板。相同的功能模板工作流程适用于Cisco IOS® XE SD-WAN设备。

共创建4个功能模板以应用于vEdge设备模板。

VPN功能模板

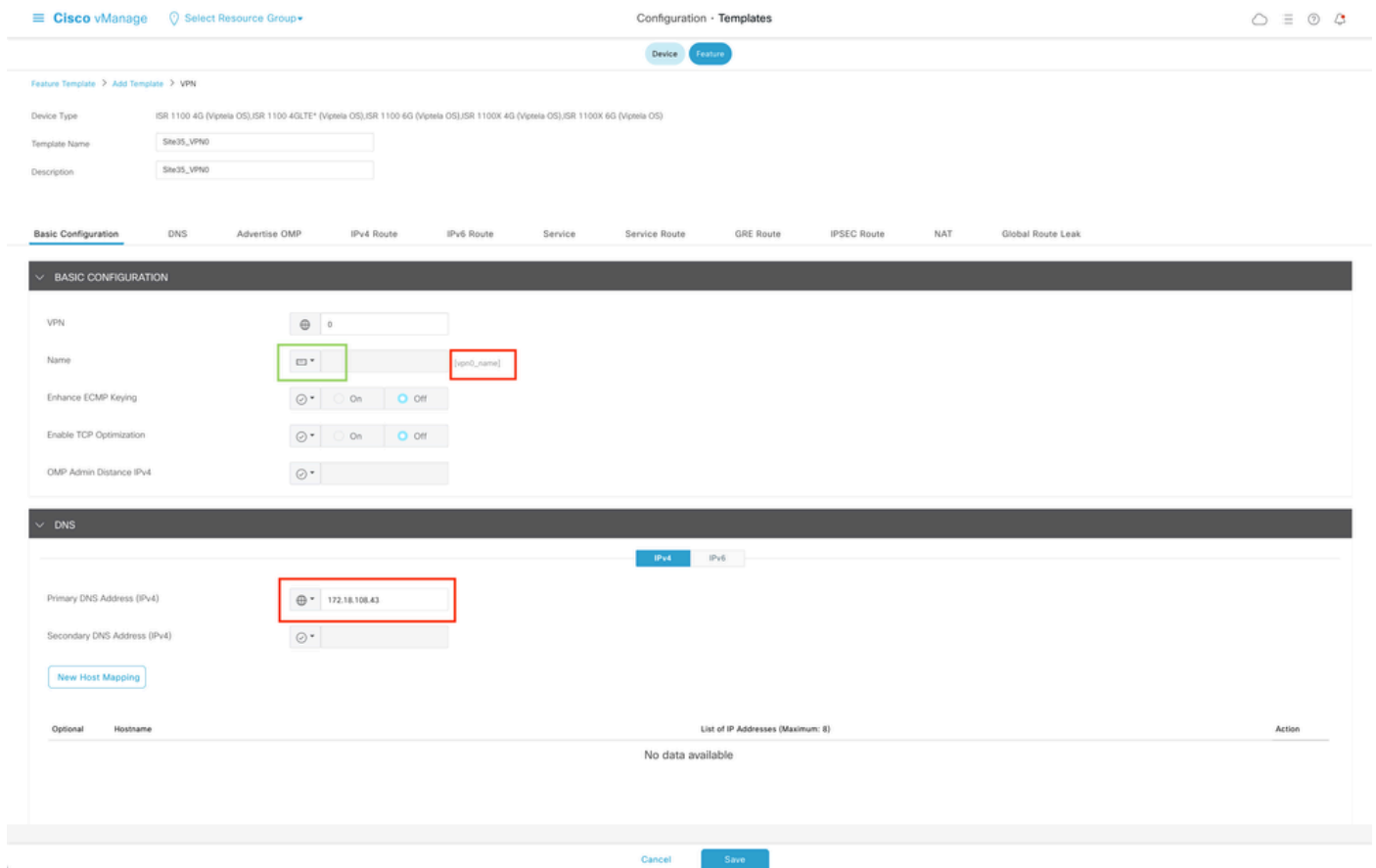
此功能模板包括VPN 0、VPN接口以太网（主WAN连接）、VPN接口以太网(Tunnel/NoTlocExt)和VPN接口以太网(TlocExt/NoTunnel)：



VPN功能模板

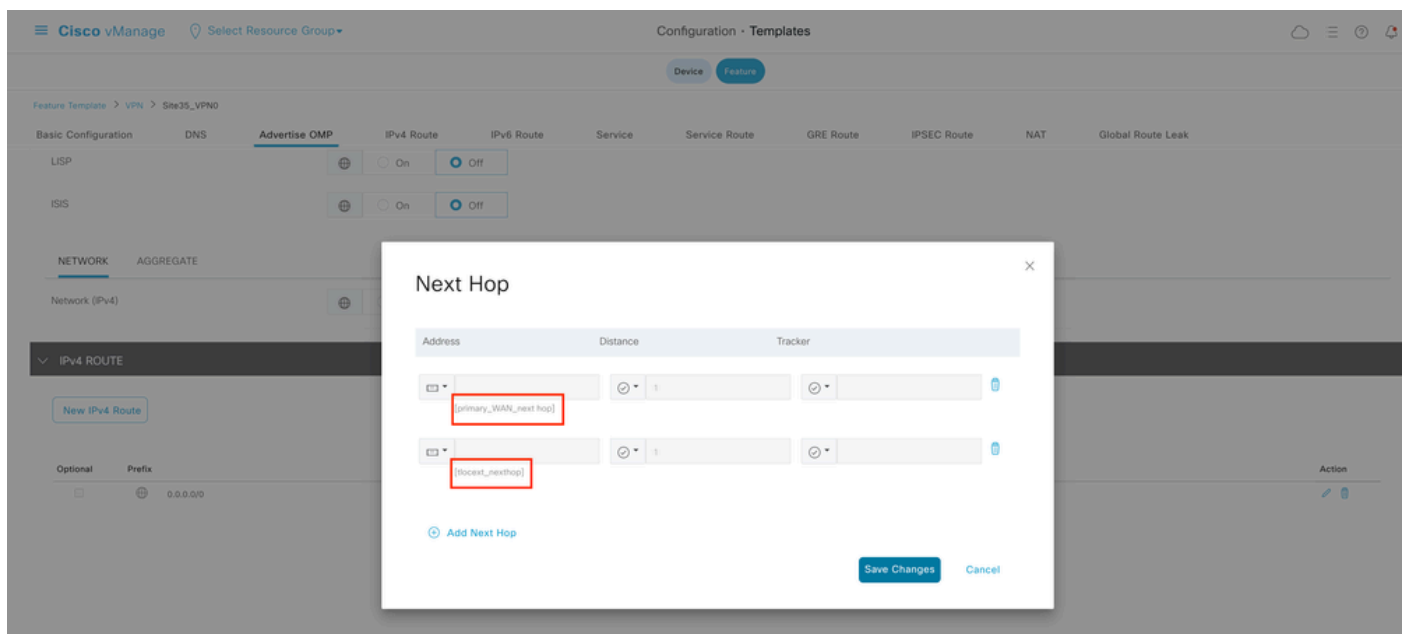
创建功能模板的步骤：

1. VPN 0：在基本配置部分中选择传输VPN的特定设备值，并在DNS部分中添加DNS服务器地址：

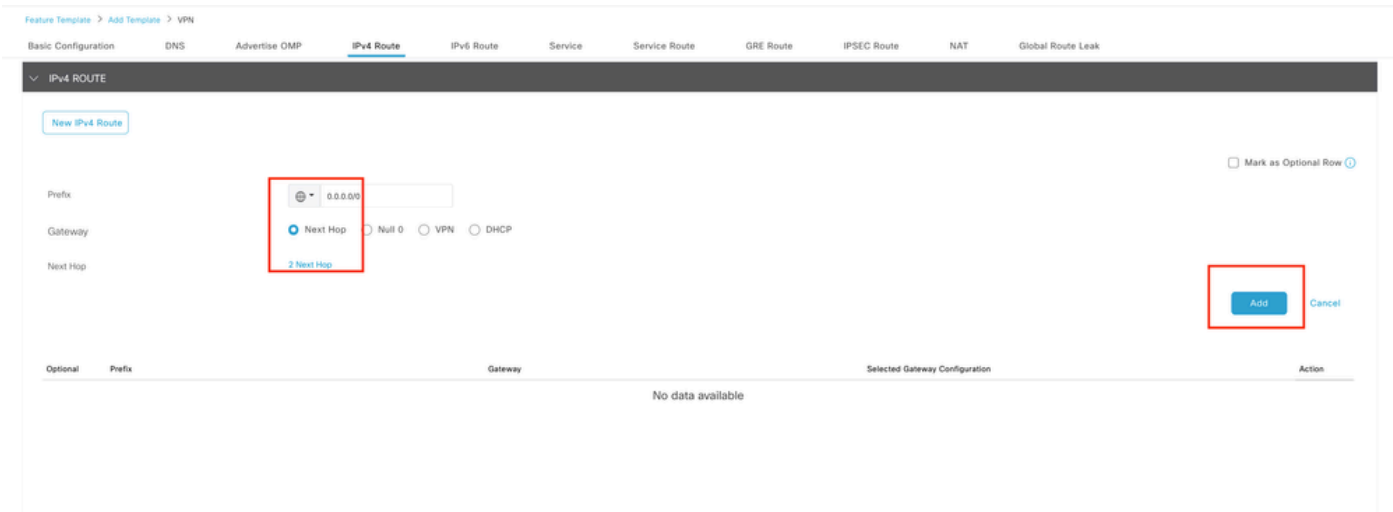


VPN 0功能模板基本配置

在IPv4路由部分中，为2个下一跳地址（主WAN和TLOC-EXT）添加具有特定设备值的前缀：

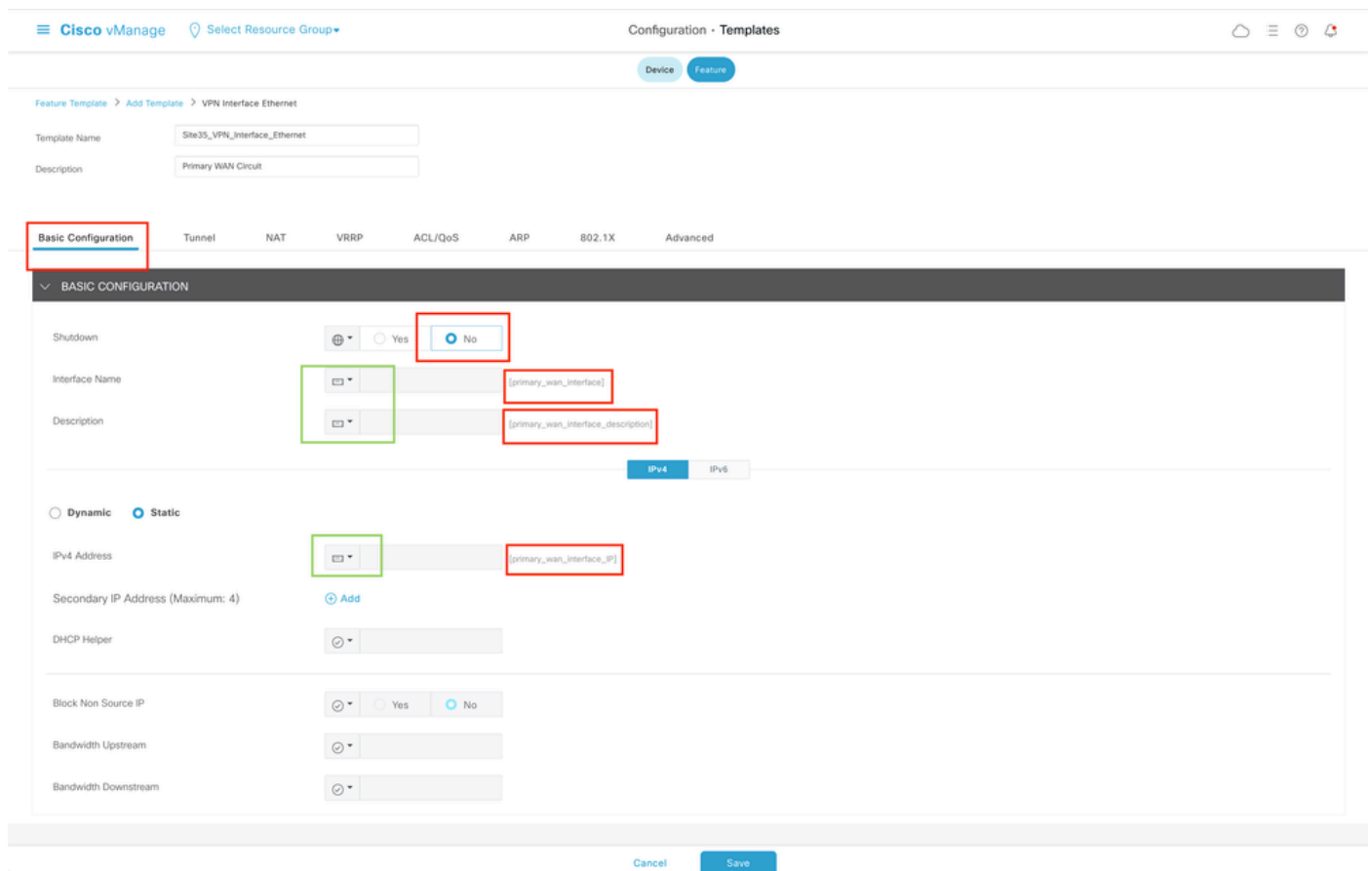


VPN 0功能模板IPv4路由



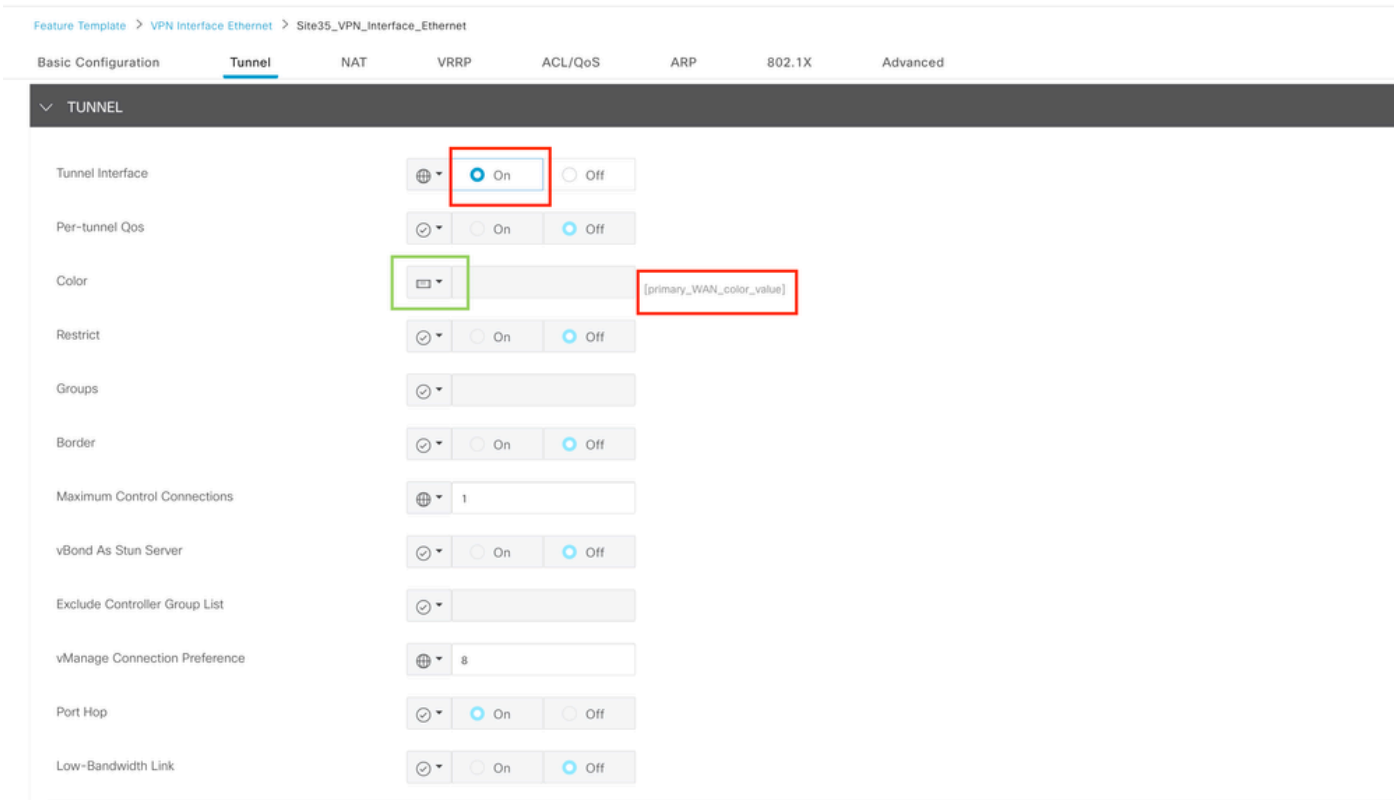
VPN 0功能模板IPv4路由下一跳

2. VPN接口以太网（主WAN连接）：确保接口处于no shutdown状态。为接口名称、说明和IP地址选择特定的设备值：



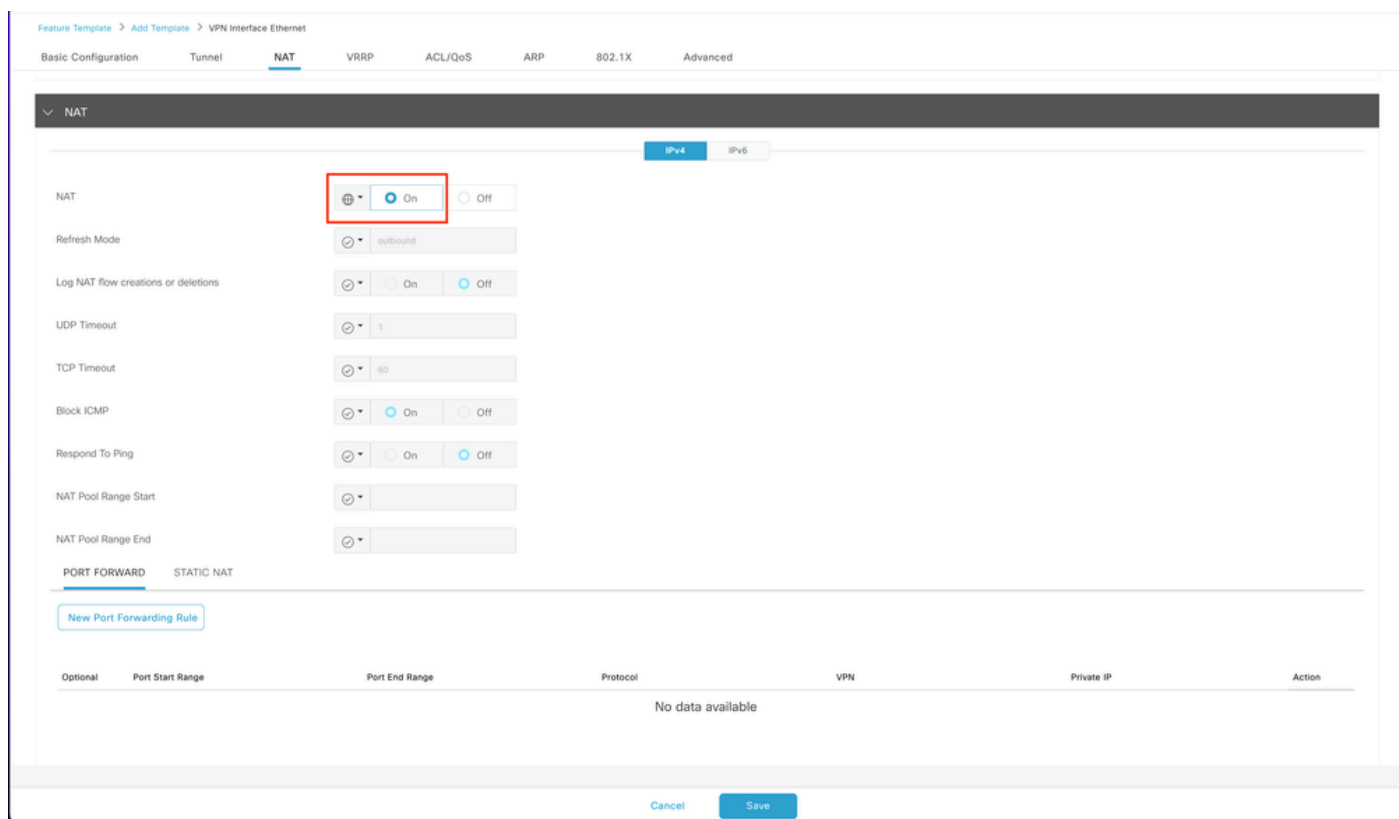
主WAN接口功能模板基本配置

确保Tunnel interface设置为ON。选择Primary WAN Color（主要广域网颜色）的特定设备值：



VPN 0功能模板隧道接口

确保将公共WAN接口的NAT设置为ON：



VPN 0接口模板NAT

3. VPN接口以太网（TLOC-EXT/NO隧道接口）：确保TLOC-Ext接口处于no shutdown状态。选择接口、说明和IP地址的特定设备值。确保隧道接口设置为Off：

Feature Template > VPN Interface Ethernet > Site35_TLOC_Ext_NoTunnel

Device Type: ISR 1100 6G (Viptela OS),ISR 1100X 6G (Viptela OS),ISR 1100 4GLTE* (Viptela OS),ISR 1100 4G (Viptela OS),ISR 1100X 4G (Viptela OS)

Template Name: Site35_TLOC_Ext_NoTunnel

Description: Site 35 TLOC Extension Template without Tunnel Config

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

BASIC CONFIGURATION

Shutdown: Yes No

Interface Name: [TLOC_NoTunnel_Interface]

Description: [TLOC_NoTunnel_Interface_Description]

IPv4 IPv6

Dynamic Static

IPv4 Address: [TLOC_NoTunnel_Interface_IP]

Secondary IP Address (Maximum: 4): [Add](#)

DHCP Helper:

Block Non Source IP: Yes No

Bandwidth Upstream:

Bandwidth Downstream:

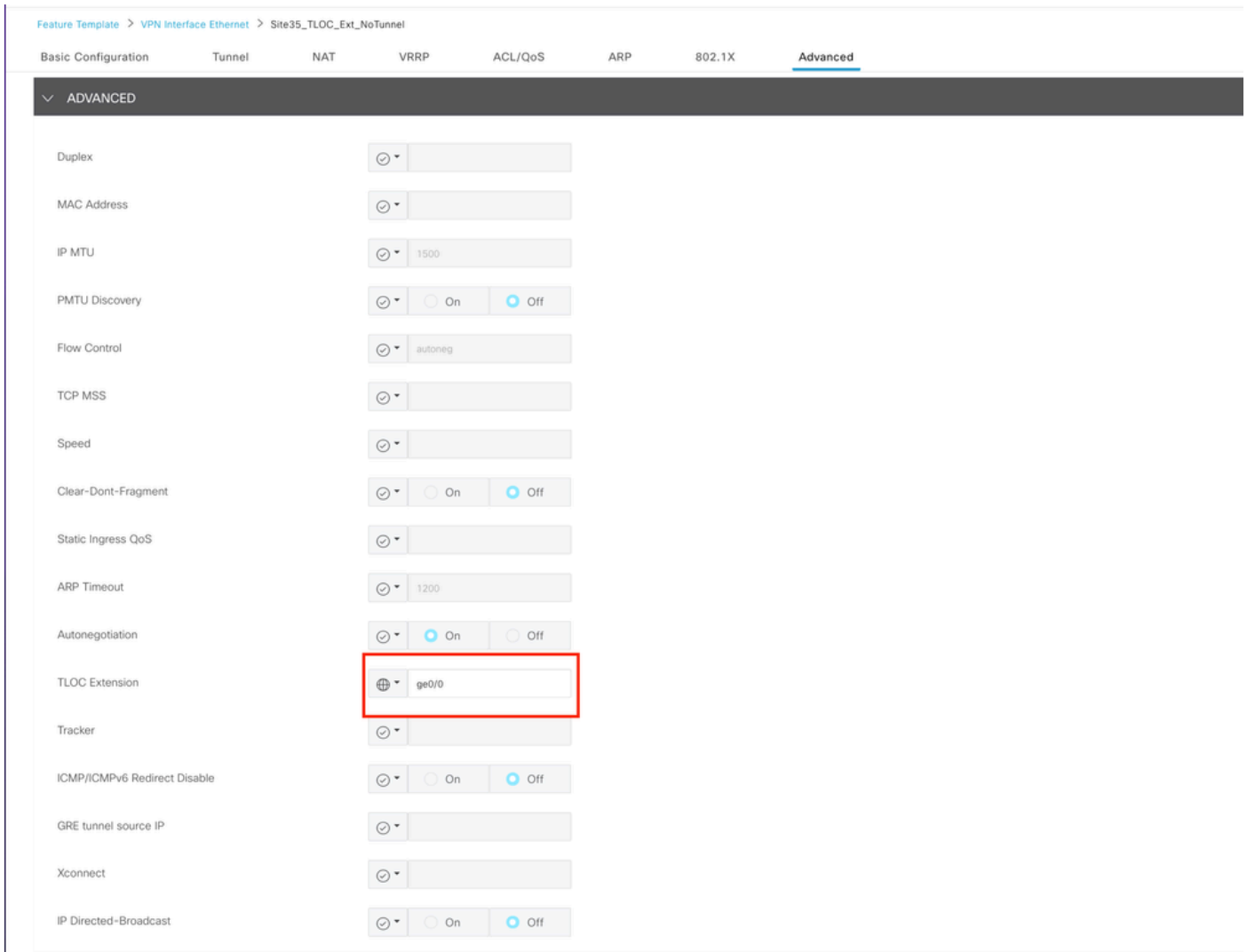
TUNNEL

Tunnel Interface: On Off

Cancel Update

TLOC-EXT/NO隧道接口基本配置

在Advanced部分中添加TLOC-Ext接口：



TLOC-Ext interface

4. VPN接口以太网（隧道接口/无Tloc-ext）：确保接口处于no shutdown状态。选择接口、说明和IP地址的特定设备值：

Device Type: ISR 1100 4G (Viptela OS),ISR 1100 4GLTE* (Viptela OS),ISR 1100 6G (Viptela OS),ISR 1100X 4G (Viptela OS),ISR 1100X 6G (Viptela OS)

Template Name: Site35_Tunnel_NoTlocExt

Description: Site 35 TLOC Tunnel Configuration No TLOC-Ext

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

▼ BASIC CONFIGURATION

Shutdown: Yes No

Interface Name: [dropdown] [interface_tunn_notlocext]

Description: [dropdown] [interface_description_tunn_notlocext]

Dynamic Static

IPv4 Address: [dropdown] [interface_ip_tunn_notlocext]

Secondary IP Address (Maximum: 4): [Add](#)

DHCP Helper: [dropdown]

IPv4 | IPv6

隧道接口/无Tloc-ext基本配置

确保隧道接口设置为ON。选择Tloc-Ext颜色的特定设备值：

Device Feature

Feature Template > Add Template > VPN Interface Ethernet

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

▼ TUNNEL

Tunnel Interface On Off

Per-tunnel Qos On Off

Color [flocext_color_value]

Restrict On Off

Groups

Border On Off

Maximum Control Connections

vBond As Stun Server On Off

Exclude Controller Group List

vManage Connection Preference 5

Port Hop On Off

Low-Bandwidth Link On Off

通道接口

设备模板

创建设备模板的步骤：

1.从功能模板创建设备模板：

Cisco vManage Select Resource Group Configuration · Templates

Device Feature

Search

Create Template

- From Feature Template
- CLI Template

Total Rows: 0

Name	Description	Type	Device Model	Device Role	Resource Group	Feature Templates	Draft Mode	Devices Attached	Updated By	Last Updated	Template Status
No data available											

功能模板中的设备模板

2. 填写所有必需的功能模板：

Device Feature

Device Model: ISR 1100 4G LTE* (Viptela OS)

Device Role: SDWAN Edge

Template Name: Site35_FeatureTemplate

Description: Template used for Site 35

Basic Information Transport & Management VPN Service VPN Cellular Additional Templates

Basic Information

System * Site35_System Additional System Templates

Logging* Site35_Logging

NTP Site35_NTP

AAA Site35_AAA BFD * Site35_BFD OMP * Site35_OMP

Security * Site35_Security

包含功能模板基本配置的设备模板详细信息

Cisco vManage Select Resource Group Configuration - Templates

Device Feature

Basic Information Transport & Management VPN Service VPN Cellular Additional Templates

Transport & Management VPN

VPN 0 * Site35_VPN0 Additional VPN 0 Templates

VPN Interface Site35_VPN_Interface_Ethernet

VPN Interface Site35_TLOC_Ext_NoTunnel

VPN Interface Site35_Tunnel_NoTlocExt

VPN 512 * Site35_VPN512 Additional VPN 512 Templates

包含功能模板的设备模板详细信息传输和管理

3. 将两台设备都连接到设备模板：

Cisco vManage Select Resource Group Configuration - Templates

Device Feature

Q Search

Create Template v

Template Type Non-Default v

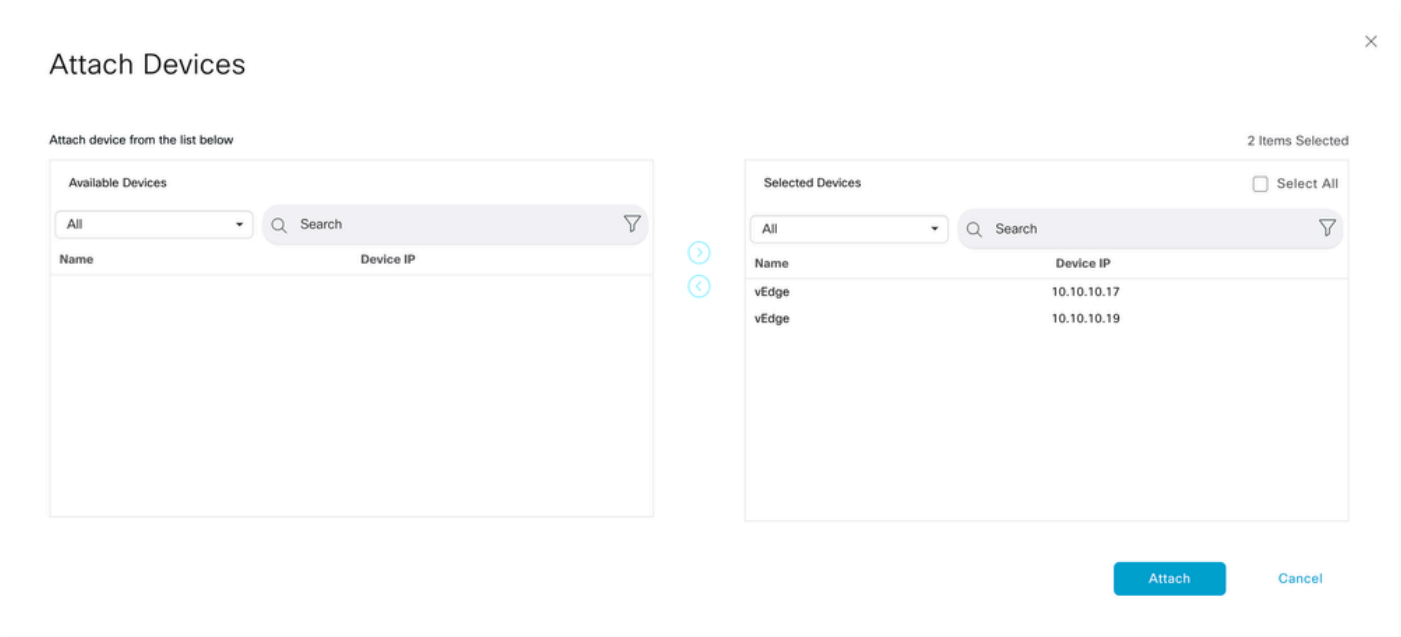
Total Rows: 1

Name	Description	Type ...	Device Model	Device Role ...	Resource Group	Feature Templates	Draft Mode	Devices Attached	Updated By	Last Updated	Template Status
Site35_FeatureTemplate	Template used ...	Feature	ISR 1100 4G LTE* (Viptela OS)	SDWAN Edge	global	12	Disabled	0	admin	25 Jul 2022 12:2...	In Sync

- Edit
- View
- Delete
- Copy
- Attach Devices
- Change Resource Group
- Export CSV

将设备附加到模板

4. 将两台设备从可用设备移至选定设备选项卡：



将设备从可用移动到选定项

5. 输入两台设备所需的所有详细信息：

Site35_vEdge1



Update Device Template

Variable List (Hover over each field for more information)

Status	complete
Chassis Number	ISR1100-4GLTEGB-FGL2347LHT6
System IP	10.10.10.17
Hostname	vEdge
Name(vpn0_name)	<input type="text" value="Transport"/>
Address(primary_WAN_next_hop)	<input type="text" value="10.201.237.1"/>
Address(tlocext_nexthop)	<input type="text" value="192.168.30.5"/>
Interface Name(interface_tunn_notlocext)	<input type="text" value="ge0/1"/>
Description(interface_description_tunn_notlocext)	<input type="text" value="TunnellInterface_NoTLOCExt"/>
IPv4 Address(interface_ip_tunn_notlocext)	<input type="text" value="192.168.30.4/24"/>
Color(tlocext_color_value)	<input type="text" value="private2"/>
Interface Name(TLOC_NoTunnel_Interface)	<input type="text" value="ge0/2"/>
Description(TLOC_NoTunnel_Interface_Description)	<input type="text" value="TLOC_NoTunnellInterface"/>
IPv4 Address(TLOC_NoTunnel_Interface_IP)	<input type="text" value="192.168.40.4/24"/>
Interface Name(primary_wan_interface)	<input type="text" value="ge0/0"/>
Description(primary_wan_interface_description)	<input type="text" value="Primary WAN connection"/>
IPv4 Address(primary_wan_interface_IP)	<input type="text" value="10.201.237.120/24"/>
Color(primary_WAN_color_value)	<input type="text" value="private1"/>
Hostname(system_host_name)	<input type="text" value="Site35_vEdge1"/>
System IP(system_system_ip)	<input type="text" value="10.10.10.17"/>
Site ID(system_site_id)	<input type="text" value="35"/>

Generate Password

Update

Cancel

更新值1

Site35_vEdge2

Update Device Template

Variable List (Hover over each field for more information)

Status	complete
Chassis Number	ISR1100-4GLTENA-FGL2347LJ1G
System IP	10.10.10.19
Hostname	vEdge
Name(vpn0_name)	Transport
Address(primary_WAN_next_hop)	10.201.237.1
Address(tlocext_nexthop)	192.168.40.4
Interface Name(interface_tunn_notlocext)	ge0/2
Description(interface_description_tunn_notlocext)	TunnelInterface_NoTLOCExt
IPv4 Address(interface_ip_tunn_notlocext)	192.168.40.5/24
Color(tlocext_color_value)	private1
Interface Name(TLOC_NoTunnel_Interface)	ge0/1
Description(TLOC_NoTunnel_Interface_Description)	TLOC_NoTunnelInterface
IPv4 Address(TLOC_NoTunnel_Interface_IP)	192.168.30.5/24
Interface Name(primary_wan_interface)	ge0/0
Description(primary_wan_interface_description)	Primary WAN connection
IPv4 Address(primary_wan_interface_IP)	10.201.237.66/24
Color(primary_WAN_color_value)	private2
Hostname(system_host_name)	Site35_vEdge2
System IP(system_system_ip)	10.10.10.19
Site ID(system_site_id)	35

Generate Password

Update

Cancel

更新值2

6. 验证所选值是否适用于以下设备：

Site35_vEdge1

Cisco vManage Configuration - Templates

Device Template: Site35_FeatureTemplate (Total: 1)

Device list (Total: 2 devices)

Filter/Search

ISR1100-4GLTEGB-FGL2347LHT6 vEdge(10.10.10.17)

ISR1100-4GLTENA-FGL2347LJ10 vEdge(10.10.10.19)

Configure Device Rollback Timer

76	allow-service sshd	78	allow-service sshd
77	no allow-service netconf	79	no allow-service netconf
78	no allow-service ntp	80	no allow-service ntp
79	no allow-service ospf	81	no allow-service ospf
80	no allow-service stun	82	no allow-service stun
81	allow-service https	83	allow-service https
82	!	84	!
83	no shutdown	85	no shutdown
84	!	86	!
		87	interface ge0/1
		88	description TunnelInterface_NoTLOCExt
		89	ip address 192.168.30.4/24
		90	tunnel-interface
		91	encapsulation ipsec
		92	color private2
		93	max-control-connections 1
		94	no allow-service bgp
		95	allow-service dhcp
		96	allow-service dns
		97	allow-service icmp
		98	no allow-service sshd
		99	no allow-service netconf
		100	no allow-service ntp
		101	no allow-service ospf
		102	no allow-service stun
		103	allow-service https
		104	!
		105	no shutdown
		106	!
		107	interface ge0/2
		108	description TLOC_NoTunnelInterface
		109	ip address 192.168.40.4/24
		110	no shutdown
		111	!
85	ip route 0.0.0.0/0 10.201.237.1 1	112	ip route 0.0.0.0/0 10.201.237.1 1
		113	ip route 0.0.0.0/0 192.168.30.5 1
86	!	114	!
87	vpn 512	115	vpn 512
88	!	116	!
89	!	117	!
90	!	118	!
91	!	119	!

Back Configure Devices Cancel

配置预览1

Site35_vEdge2

Cisco vManage Configuration - Templates

Device Template: Site35_FeatureTemplate (Total: 1)

Device list (Total: 2 devices)

Filter/Search

ISR1100-4GLTEGB-FGL2347LHT6 vEdge(10.10.10.17)

ISR1100-4GLTENA-FGL2347LJ10 vEdge(10.10.10.19)

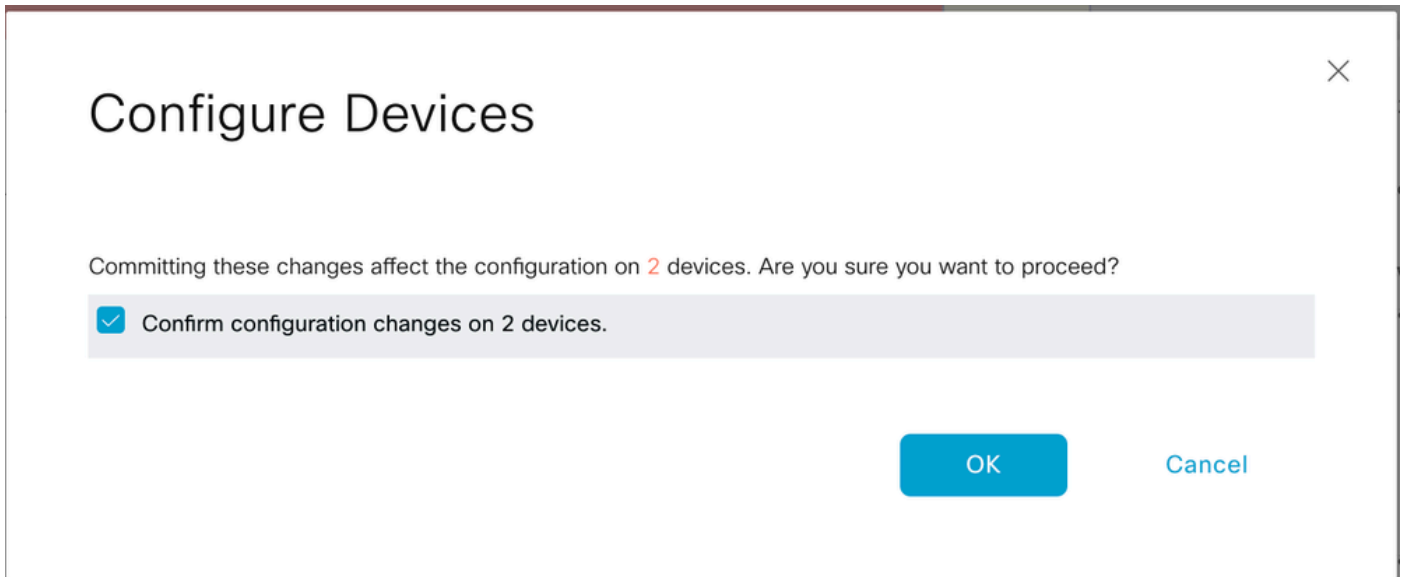
Configure Device Rollback Timer

75	allow-service sshd	78	allow-service sshd
76	no allow-service netconf	79	no allow-service netconf
77	no allow-service ntp	80	no allow-service ntp
78	no allow-service ospf	81	no allow-service ospf
79	no allow-service stun	82	no allow-service stun
80	allow-service https	83	allow-service https
81	!	84	!
82	no shutdown	85	no shutdown
83	!	86	!
		87	interface ge0/1
		88	description TLOC_NoTunnelInterface
		89	ip address 192.168.30.5/24
		90	no shutdown
		91	!
		92	interface ge0/2
		93	description TunnelInterface_NoTLOCExt
		94	ip address 192.168.40.5/24
		95	tunnel-interface
		96	encapsulation ipsec
		97	color private1
		98	max-control-connections 1
		99	no allow-service bgp
		100	allow-service dhcp
		101	allow-service dns
		102	allow-service icmp
		103	no allow-service sshd
		104	no allow-service netconf
		105	no allow-service ntp
		106	no allow-service ospf
		107	no allow-service stun
		108	allow-service https
		109	!
		110	no shutdown
		111	!
84	ip route 0.0.0.0/0 10.201.237.1 1	112	ip route 0.0.0.0/0 10.201.237.1 1
		113	ip route 0.0.0.0/0 192.168.40.4 1
85	!	114	!
86	vpn 512	115	vpn 512
87	!	116	!
88	!	117	!
89	!	118	!
90	!	119	!

Back Configure Devices Cancel

配置预览2

6. 最后，将以下配置推送到设备：



配置配置

成功推送模板后，下一个输出将捕获vpn 0的运行配置：

Site35_vEdge1

```
Site35_vEdge1# show run vpn 0
vpn 0
interface ge0/0
ip address 10.201.237.120/24
ipv6 dhcp-client
nat
!
tunnel-interface
encapsulation ipsec
color private1
max-control-connections 1
no allow-service bgp
allow-service dhcp
allow-service dns
allow-service icmp
allow-service sshd
no allow-service netconf
no allow-service ntp
no allow-service ospf
no allow-service stun
allow-service https
!
no shutdown
!
interface ge0/1
description TunnelInterface_NoTLOExt
ip address 192.168.30.4/24
tunnel-interface
encapsulation ipsec
color private2
max-control-connections 1
no allow-service bgp
allow-service dhcp
allow-service dns
```

```
allow-service icmp
no allow-service sshd
no allow-service netconf
no allow-service ntp
no allow-service ospf
no allow-service stun
allow-service https
!
no shutdown
!
interface ge0/2
description TL0C_NoTunnelInterface
ip address 192.168.40.4/24
tloc-extension ge0/0
no shutdown
!

ip route 0.0.0.0/0 10.201.237.1
ip route 0.0.0.0/0 192.168.30.5
!
Site35_vEdge1#
```

Site35_vEdge2

```
Site35_vEdge2#
Site35_vEdge2#
Site35_vEdge2#
Site35_vEdge2# sh run vpn 0
vpn 0
interface ge0/0
ip address 10.201.237.66/24
ipv6 dhcp-client
nat
!
tunnel-interface
encapsulation ipsec
color private2
max-control-connections 1
no allow-service bgp
allow-service dhcp
allow-service dns
allow-service icmp
allow-service sshd
no allow-service netconf
no allow-service ntp
no allow-service ospf
no allow-service stun
allow-service https
!
no shutdown
!
interface ge0/1
description TL0C_NoTunnelInterface
ip address 192.168.30.5/24
tloc-extension ge0/0
no shutdown
!
interface ge0/2
```



```

description TunnelInterface_NoTLOExt
ip address 192.168.40.5/24
tunnel-interface
encapsulation ipsec
color private1
max-control-connections 1
no allow-service bgp
allow-service dhcp
allow-service dns
allow-service icmp
no allow-service sshd
no allow-service netconf
no allow-service ntp
no allow-service ospf
no allow-service stun
allow-service https
!
no shutdown
!
ip route 0.0.0.0/0 10.201.237.1
ip route 0.0.0.0/0 192.168.40.4
!
Site35_vEdge2#

```

确认

1. 模板已成功附加到两个设备：

Push Feature Template Configuration ● Validation Success Initiated By: admin From: 10.24.227.28

Total Task: 2 | Success: 2

Search Total Rows: 2

Status	Message	Chassis Number	Device Model	Hostname	System IP	Site ID	vManage IP
● Success	Done - Push Feature Template Con...	ISR1100-4GLTEGB-FGL2347LHT6	ISR 1100 4GLTE* (Viptela OS)	vEdge	10.10.10.17	35	10.10.10.1
<pre> [25-Jul-2022 18:16:20 UTC] Checking and creating device in vManage [25-Jul-2022 18:16:21 UTC] Generating configuration from template [25-Jul-2022 18:16:27 UTC] Device is online [25-Jul-2022 18:16:27 UTC] Updating device configuration in vManage [25-Jul-2022 18:16:27 UTC] Sending configuration to device [25-Jul-2022 18:16:40 UTC] Completed template push to device. [25-Jul-2022 18:16:41 UTC] Template successfully attached to device </pre>							
● Success	Done - Push Feature Template Con...	ISR1100-4GLTENA-FGL2347LJ1G	ISR 1100 4GLTE* (Viptela OS)	vEdge	10.10.10.19	35	10.10.10.1
<pre> [25-Jul-2022 18:16:20 UTC] Checking and creating device in vManage [25-Jul-2022 18:16:20 UTC] Generating configuration from template [25-Jul-2022 18:16:26 UTC] Device is online [25-Jul-2022 18:16:26 UTC] Updating device configuration in vManage [25-Jul-2022 18:16:27 UTC] Sending configuration to device [25-Jul-2022 18:16:38 UTC] Completed template push to device. [25-Jul-2022 18:16:41 UTC] Template successfully attached to device </pre>							

模板推送成功

2. 控制连接通过主WAN和TLOC-Ext接口启用：

```
Site35_vEdge1# show control connections
```

PEER TYPE	PEER PROT	PEER SYSTEM IP	SITE ID	DOMAIN ID	PEER PRIVATE IP	PEER PRIV PORT	PEER PUBLIC IP	PEER PUB PORT	ORGANIZATION	LOCAL COLOR	CONTROLLER GROUP	PROXY	STATE	UPTIME	ID
vsmart	dtls	10.10.10.3	1	1	10.201.237.137	12446	10.201.237.137	12446	rcdn_sdwan_lab	private1	No	up	0:00:01:47	0	
vsmart	dtls	10.10.10.3	1	1	10.201.237.137	12446	10.201.237.137	12446	rcdn_sdwan_lab	private2	No	up	0:00:01:42	0	
vmanage	dtls	10.10.10.1	1	0	10.201.237.91	12446	10.201.237.91	12446	rcdn_sdwan_lab	private1	No	up	0:00:01:52	0	

```
Site35_vEdge1#
```

控制连接验证1

```
Site35_vEdge2# show control connections
```

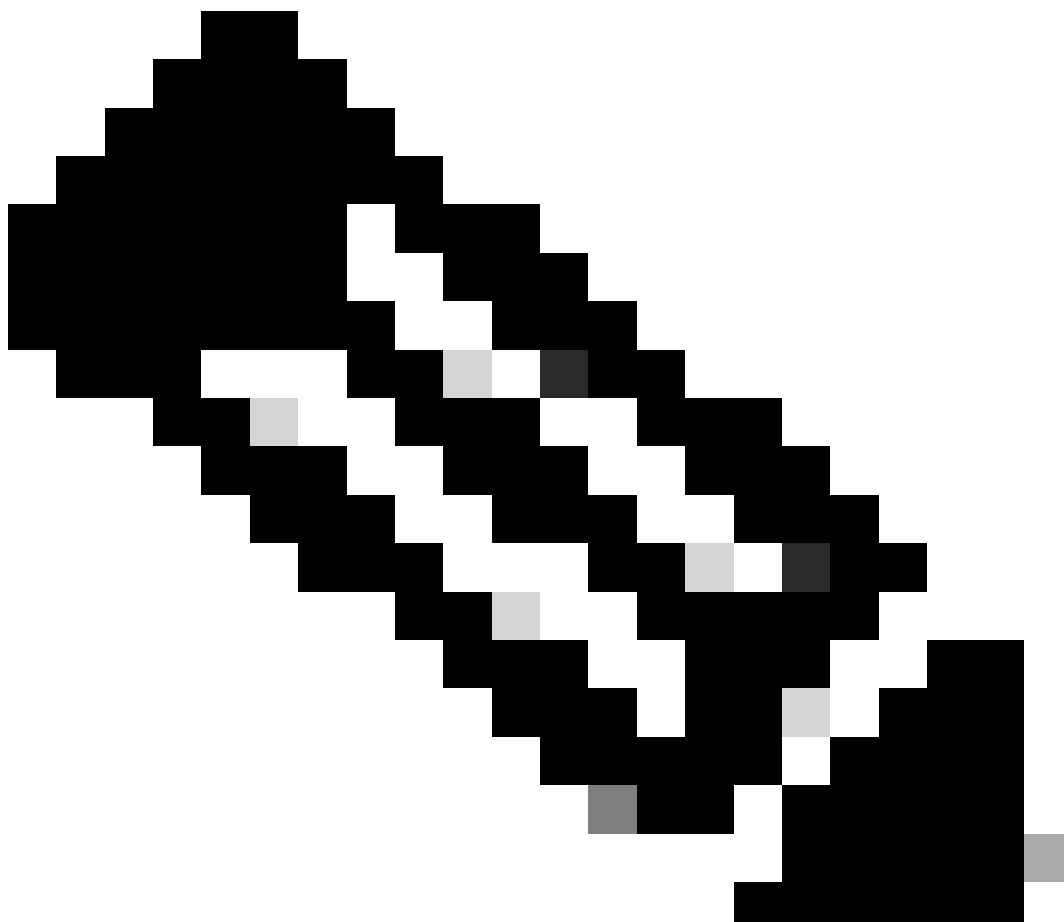
PEER TYPE	PEER PROT	PEER SYSTEM IP	SITE ID	DOMAIN ID	PEER PRIVATE IP	PEER PRIV PORT	PEER PUBLIC IP	PEER PUB PORT	LOCAL COLOR	PROXY	STATE	UPTIME	CONTROLLER GROUP ID
vsmart	dtls	10.10.10.3	1	1	10.201.237.137	12446	10.201.237.137	12446	private2	No	up	0:00:00:25	0
vsmart	dtls	10.10.10.3	1	1	10.201.237.137	12446	10.201.237.137	12446	private1	No	up	0:00:00:15	0
vmanage	dtls	10.10.10.1	1	0	10.201.237.91	12446	10.201.237.91	12446	private2	No	up	0:00:00:20	0

控制连接验证2

使用案例

根据本地站点设计，也可以使用L2或L3 TLOC扩展实施TLOC扩展。

1. L2 TLOC扩展：这些扩展位于同一广播域或同一子网中。
2. L3 TLOC扩展：这些扩展由L3设备分隔，可以运行任何路由协议（仅在Cisco IOSXE SD-WAN设备上受支持）



注意：请参阅[Cisco SD-WAN设计指南](#)的“广域网边缘部署”一章中的“TLOC扩展”部分。

限制

仅•3层路由接口支持TLOC和TLOC扩展接口。L2交换机端口/SVI不能用作WAN/隧道接口，并且只能在服务端使用。

- LTE也不用作广域网边缘路由器之间的TLOC扩展接口。
- 仅Cisco IOSXE SD-WAN路由器支持L3 TLOC扩展，vEdge路由器不支持该扩展。
- TLOC扩展在绑定到环回隧道接口的传输接口上不起作用。

相关信息

- [思科技术支持和下载](#)

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