

# Configure Connectivity Between Different TLOC Colors

## Contents

[Introduction](#)

[Prerequisites](#)

[Requirements](#)

[Components Used](#)

[Background Information](#)

[Configure](#)

[Network Diagram](#)

[Configuration](#)

[Verify](#)

[Troubleshoot](#)

[Summary](#)

[Related Information](#)

## Introduction

This document describes the configuration that can allow a user to implement connectivity between different Transport Location (TLOC) colors.

## Prerequisites

## Requirements

Cisco recommends that you have knowledge of these topics:

- Basic understanding of Viptela Software Defined Wide Area Network (SDWAN) solution
- vSmart route policies
- Overlay Management Protocol (OMP)

## Components Used

This document is not restricted to specific software and hardware versions.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

## Background Information

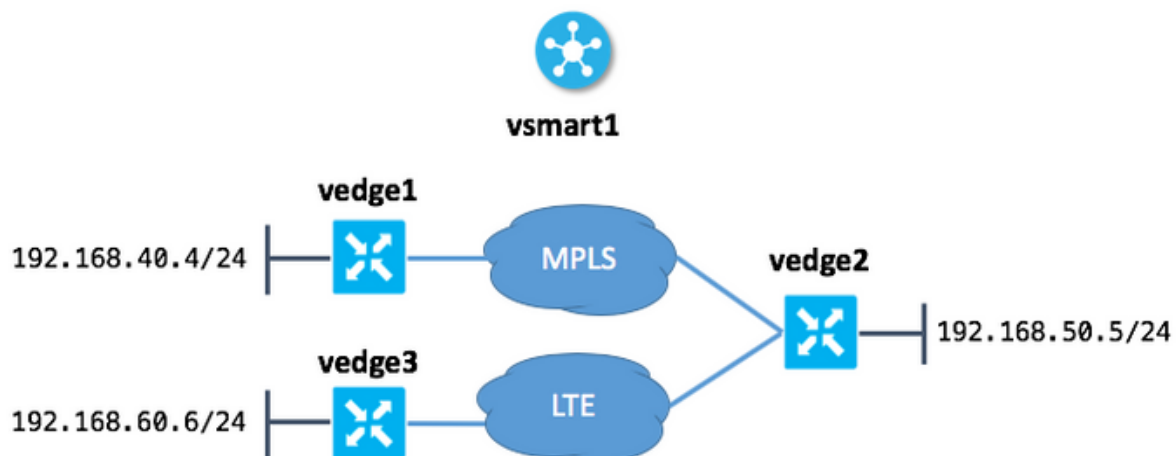
This configuration can be helpful when a user has sites with different connections that cannot build tunnels between them (e.g. Multiprotocol Label Switching (MPLS) color (MPLS L3 Virtual Private Network (VPN) connection) and internet/Long-Term Evolution (LTE) (generic internet connection from Internet Service Provider (ISP) or 3G/LTE connection). The two remote offices won't be able to form tunnel between them if in one office you have MPLS only connection and in the another - internet only, but if there is some site with connection to both colors, then it is easily achievable with the help of default or summary route advertised from this dual-connected site.

## Configure

All sites use single VPN 40. This is the table that summarizes system settings on all 3 vEdges:

hostname	site-id	system-ip
vedge1	40	192.168.30.4
vedge2	50	192.168.30.5
vedge3	60	192.168.30.6

## Network Diagram



## Configuration

Here is the configuration applied on vSmart in order to allow connectivity between sites:

```
policy
 lists
  site-list sites_ve1_40_ve3_60
  site-id 40
  site-id 60
 !
 control-policy ROUTE_LEAK
 sequence 10
 match route
  site-list sites_ve1_40_ve3_60
```

```

!
action accept
  set
    service vpn 40
!
!
!
default-action accept
!
apply-policy
  site-list sites_ve1_40_ve3_60
  control-policy ROUTE_LEAK out
!
!

```

## Verify

Use this section in order to confirm that your configuration works properly.

Before control-policy is applied:

```
vedge1# show ip routes vpn 40
```

VPN	PREFIX	PROTOCOL	PROTOCOL	NEXTHOP	NEXTHOP	NEXTHOP		
IP	COLOR	ENCAP	STATUS	SUB TYPE	IF NAME	ADDR	VPN	TLOC
40	192.168.40.0/24	connected	-	-	ge0/1	-	-	-
-	-	F,S						
40	192.168.50.0/24	omp	-	-	-	-	-	-
192.168.30.5	mpls	ipsec	F,S					

```
vedge2# show ip routes vpn 40
```

VPN	PREFIX	PROTOCOL	PROTOCOL	NEXTHOP	NEXTHOP	NEXTHOP		
IP	COLOR	ENCAP	STATUS	SUB TYPE	IF NAME	ADDR	VPN	TLOC
40	192.168.40.0/24	omp	-	-	-	-	-	-
192.168.30.4	mpls	ipsec	F,S					
40	192.168.50.0/24	connected	-	-	ge0/2	-	-	-
-	-	F,S						
40	192.168.60.0/24	omp	-	-	-	-	-	-
192.168.30.6	lte	ipsec	F,S					

```
vedge3# show ip routes vpn 40
```

VPN	PREFIX	PROTOCOL	PROTOCOL	NEXTHOP	NEXTHOP	NEXTHOP		
IP	COLOR	ENCAP	STATUS	SUB TYPE	IF NAME	ADDR	VPN	TLOC
40	192.168.50.0/24	omp	-	-	-	-	-	-
192.168.30.5	lte	ipsec	F,S					

```

40      192.168.60.0/24      connected      -      ge0/1      -      -      -
-      -      F,S

```

After the policy is applied in the **apply-policy** section on vSmart:

```
vedge1# show ip routes vpn 40
```

VPN	PREFIX	PROTOCOL	PROTOCOL	NEXTHOP	NEXTHOP	NEXTHOP		
IP	COLOR	ENCAP	STATUS	SUB TYPE	IF NAME	ADDR	VPN	TLOC
40	192.168.40.0/24	connected	-	ge0/1	-	-	-	-
-	-	F,S						
40	192.168.50.0/24	omp	-	-	-	-	-	-
192.168.30.5	mpls	ipsec	F,S					
40	192.168.60.0/24	omp	- - - -	192.168.30.5	mpls	ipsec	F,S	

```
vedge2# show ip routes vpn 40
```

VPN	PREFIX	PROTOCOL	PROTOCOL	NEXTHOP	NEXTHOP	NEXTHOP		
IP	COLOR	ENCAP	STATUS	SUB TYPE	IF NAME	ADDR	VPN	TLOC
40	192.168.40.0/24	omp	-	-	-	-	-	-
192.168.30.4	mpls	ipsec	F,S					
40	192.168.50.0/24	connected	-	ge0/2	-	-	-	-
-	-	F,S						
40	192.168.60.0/24	omp	-	-	-	-	-	-
192.168.30.6	lte	ipsec	F,S					

```
vedge3# show ip routes vpn 40
```

VPN	PREFIX	PROTOCOL	PROTOCOL	NEXTHOP	NEXTHOP	NEXTHOP		
IP	COLOR	ENCAP	STATUS	SUB TYPE	IF NAME	ADDR	VPN	TLOC
40	192.168.40.0/24	omp	- - - -	192.168.30.5	lte	ipsec	F,S	40
192.168.30.5	lte	ipsec	F,S	40	192.168.60.0/24	connected	-	ge0/1
								- - - -
								F,S

## Troubleshoot

This section provides information you can use in order to troubleshoot your configuration.

Check that OMP routes are presented in an OMP table with C, I, R status:

```
vedge3# show omp routes
```

Code:

```

C -> chosen
I -> installed
Red -> redistributed
Rej -> rejected
L -> looped
R -> resolved
S -> stale
Ext -> extranet
Inv -> invalid
Stg -> staged
U -> TLOC unresolved

```

VPN COLOR	PREFIX	ENCAP	FROM PEER PREFERENCE	PATH ID	LABEL	STATUS	ATTRIBUTE TYPE	TLOC IP
40	192.168.40.0/24	mpls	ipsec -	262	1002	Inv,U	installed	192.168.30.4
40	192.168.40.0/24	mpls	ipsec -	263	1002	Inv,U	installed	192.168.30.5
				264	1002	C,I,R	installed	192.168.30.5
			192.168.30.3 lte ipsec -	265	1002	L,R,Inv	installed	192.168.30.6
			192.168.30.3	260	1002	Inv,U	installed	192.168.30.5
			mpls ipsec -	261	1002	C,I,R	installed	192.168.30.5
			192.168.30.5 lte ipsec -	38	1002	C,Red,R	installed	192.168.30.6
			192.168.60.0/24 0.0.0.0					

Recap that vEdge3 has only LTE color connectivity.

If routes are not presented, check that vSmart advertises routes:

```
vsmart1# show omp peers 192.168.30.6
R -> routes received
I -> routes installed
S -> routes sent
```

PEER	TYPE	DOMAIN ID	OVERLAY ID	SITE ID	STATE	UPTIME	R/I/S
192.168.30.6	vedge	1	1	60	up	12:15:27:59	1/0/3

Check OMP route attributes on vSmart:

```
vsmart1# show omp routes 192.168.40.0/24 detail | nomore
```

```
omp route entries for vpn 40 route 192.168.40.0/24
```

```
RECEIVED FROM:
peer          192.168.30.4
path-id       34
label         1002
status        C,R
loss-reason   not set
lost-to-peer  not set
lost-to-path-id not set

Attributes:
originator    192.168.30.4
type          installed
tloc          192.168.30.4, mpls, ipsec
ultimate-tloc not set
domain-id     not set
overlay-id    1
site-id       40
preference    not set
tag           not set
origin-proto  connected
origin-metric 0
as-path       not set
unknown-attr-len not set
```

```
ADVERTISED TO:
peer 192.168.30.5
Attributes:
  originator 192.168.30.4
  label      1002
  path-id    526
  tloc       192.168.30.4, mpls, ipsec
  ultimate-tloc not set
  domain-id  not set
  site-id    40
  overlay-id 1
  preference not set
  tag        not set
  origin-proto connected
  origin-metric 0
  as-path    not set
  unknown-attr-len not set
```

```
ADVERTISED TO: peer 192.168.30.6 Attributes: originator 192.168.30.4 label 1002 path-id 269 tloc
192.168.30.6, lte, ipsec ultimate-tloc not set domain-id not set site-id 40 overlay-id 1
preference not set tag not set origin-proto connected origin-metric 0 as-path not set unknown-
attr-len not set Attributes: originator 192.168.30.4 label 1002 path-id 268 tloc 192.168.30.5,
lte, ipsec ultimate-tloc not set domain-id not set site-id 40 overlay-id 1 preference not set
tag not set origin-proto connected origin-metric 0 as-path not set unknown-attr-len not set
Attributes: originator 192.168.30.4 label 1002 path-id 267 tloc 192.168.30.5, mpls, ipsec
ultimate-tloc not set domain-id not set site-id 40 overlay-id 1 preference not set tag not set
origin-proto connected origin-metric 0 as-path not set unknown-attr-len not set Attributes:
originator 192.168.30.4 label 1002 path-id 266 tloc 192.168.30.4, mpls, ipsec ultimate-tloc not
set domain-id not set site-id 40 overlay-id 1 preference not set tag not set origin-proto
connected origin-metric 0 as-path not set unknown-attr-len not set
```

## Summary

The configuration for this kind of route-leaking like behavior is quite simple and can be used when it is not possible to advertise an aggregated route for some reason (although in our example you could do this to solve the task without control-policy):

```
vedge2# show running-config vpn 40
vpn 40
  ip route 192.168.0.0/16 null0
  omp
  advertise static
  !
  !
```

Also, this is helpful when you can not use the default route to advertise it from central/hub site (vEdge2 in our case) when this configuration is used:

```
vedge2# show running-config vpn 40
vpn 40
  ip route 192.168.0.0/16 null0
  omp
  advertise static
  !
  !
```

Because default route with next-hop in VPN 0 won't be advertised, this is the expected behavior:

```
vedge2# show running-config vpn 40
vpn 40
 ip route 192.168.0.0/16 null0
 omp
  advertise static
 !
 !
```

Here you can use either summary route or use control-policy in order to advertise specific routes as you did in this document.

## Related Information

- [Cisco SD-WAN Design Guide](#)
- [Technical Support & Documentation - Cisco Systems](#)