CHAPTER 44

Sample Configlets

This appendix provides sample configlets for traffic engineering service provisioning in Cisco Prime Fulfillment. It includes the following sections:

Overview

The configlets included in this appendix show the CLIs generated by Prime Fulfillment for particular services and features. Each configlet example provides the following information:

- Service
- Feature
- Devices configuration (network role, hardware platform, relationship of the devices and other relevant information)
- Sample configlets for each device in the configuration
- Comments.

All examples in this appendix assume the presence of an MPLS-TE core.

Note The configlets generated by Prime Fulfillment are only the delta between what needs to be provisioned and what currently exists on the device. This means that if a relevant CLI is already on the device, it does not show up in the associated configlet.

Primary Tunnel Configlet (IOS)

Configuration

- Service: MPLS-TE primary tunnel
- Feature: MPLS TE configlet (IOS) for deploying a primary tunnel
- Device configuration: CISCO12410 with IOS 12.0(32)S.

Configlets

IOS Device Configuration	Comments
! **Explicit path:** ip explicit-path name isctmp2-isctmp8-1 enable next-address 10.2.2.145 next-address 10.2.2.174 ! ! **Primary tunnel:** interface Tunnel1000 description CISCO ISC-P24 ip unnumbered Loopback0 no ip directed-broadcast tag-switching ip tunnel destination 192.168.118.183 tunnel mode mpls traffic-eng tunnel mpls traffic-eng priority 0 0 tunnel mpls traffic-eng bandwidth 10 tunnel mpls traffic-eng affinity 0x0 mask 0x0 tunnel mpls traffic-eng path-option 1 explicit name isctmp2-isctmp8-1 tunnel mpls traffic-eng path-option 2 dynamic tunnel mpls traffic-eng record-route !	Create an explicit path with the specified next addresses, which indicate the strict path that the tunnel traverses. This explicit path is used by the primary tunnel detailed above. Create a TE primary tunnel with the following attributes: - tag switching: This command is generated because the policy has the 'mpls ip' flag enabled. This allows the TE tunnels to be used for MPLS VPN traffic. - Destination 192.168.118.183 - TE encapsulation - Setup and hold priorities both 0 - Bandwidth global pool 10 kbps - Tunnel affinity 0x0 - Explicit first path option - Dynamic second path option

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Bandwidth Protection Backup Tunnel Configlet (IOS)

Configuration

- Service: MPLS-TE with FRR (Fast Re-Route)
- Feature: This tunnel protects primary tunnel traffic in the event of either a link or node failure
- Device configuration: CISCO12410 with IOS 12.0(32)S.

Configlets

IOS Device Configuration	Comments
! Explicit path: ip explicit-path name isctmp5-isctmp4-1 enable next-address 10.2.2.145 next-address 10.2.2.174 !	Create an explicit path with the specified next addresses, which indicate the strict path that the tunnel traverses. This explicit path is used by the backup tunnel detailed above.
! Backup tunnel: interface Tunnel1001 description CISCO ISC-B30 ip unnumbered Loopback0 tunnel destination 192.168.118.213 tunnel mode mpls traffic-eng tunnel mpls traffic-eng backup-bw sub-pool 30000 tunnel mpls traffic-eng priority 0 0 tunnel mpls traffic-eng affinity 0x0 mask 0x0 tunnel mpls traffic-eng path-option 1 explicit name isctmp5-isctmp4-1 tunnel mpls traffic-eng record-route !	Create a TE backup tunnel with the following attributes: - Destination 192.168.118.213 - TE encapsulation - Protect subpool bandwidth of 30000 kbps - Setup and hold priorities both 0 - Tunnel affinity 0x0 - Explicit first path option
interface POS0/1 mpls traffic-eng backup-path tunnel 1001 !	Backup tunnel 1001 protects interface POS0/1

Connectivity Protection Backup Tunnel Configlet (IOS)

Configuration

- Service: MPLS-TE with FRR (Fast Re-Route)
- Feature: MPLS TE configlet (IOS) for deploying a connectivity protection backup tunnel and its associated exclude address path
- Device configuration: CISCO12410 with IOS 12.0(32)S.

Configlets

IOS Device Configuration	Comments
! **Explicit path:** ip explicit-path name L47-excl enable exclude-address 192.168.1.18 ! !	Create an explicit path with an exclude address, which indicates the IP address the path should avoid. This explicit path is used by the backup tunnel detailed above.

! **Backup tunnel:**
interface Tunnel1000
  description CISCO ISC-B1
  ip unnumbered Loopback0
  tunnel mode mpls traffic-eng
  tunnel destination 10.52.96.38
  tunnel mpls traffic-eng priority 0 0
  no tunnel mpls traffic-eng bandwidth
  tunnel mpls traffic-eng path-option 1
explicit name L47-excl
  tunnel mpls traffic-eng affinity 0x0 mask
0x0
  tunnel mpls traffic-eng backup-bw
sub-pool unlimited
  tunnel mpls traffic-eng record-route
!
	Create a TE backup tunnel with the following attributes:
	- Destination 10.52.96.38
	- TE encapsulation
	- Setup and hold priorities both 0
	- Backup tunnel does not reserve any bandwidth
	- Explicit first path option
	- Tunnel affinity 0x0
	- Unlimited backup bandwidth for protecting sub pool

interface ATM4/0.1 point-to-point mpls traffic-eng backup-path Tunnel1000	Set up backup path on ATM interface.

TE Traffic Admission Configlet Using CBTS (IOS)

Configuration

- Service: TE Traffic Admission
- Feature: MPLS TE configlet (IOS) for admitting traffic using Class-Based Tunnel Selection (CBTS)
- Device configuration: CISCO12410 with IOS 12.0(32)S.

Configlets

IOS Device Configuration	Comments
! **TE Traffic Admission using CBTS:** interface Tunnel1000 tunnel mpls traffic-eng exp 1 2 3 ! ! **Static route:** ip route 192.168.118.189 255.255.255.255 Tunnel1000	Class-based tunnel selection where traffic with EXP bit 1, 2, or 3 are selected Create a static route, which admits all traffic destined for 192.168.118.189 into the above-configured Tunnel 1000.

The above is then deployed to an already existing primary tunnel such as the Primary Tunnel Configlet (IOS), page 44-2.

TE Traffic Admission Configlet (IOS)

Configuration

- Service: TE Traffic Admission
- Feature: MPLS TE configlet (IOS) for TE Traffic Admission
- Device configuration: OSR-7609 with IOS 12.2(33)SRA.

Configlets

IOS Device Configuration	Comments

! **TE Traffic Admission:**
interface Tunnel1000
  tunnel mpls traffic-eng autoroute announce
  tunnel mpls traffic-eng autoroute metric relative 0
	Autoroute announce with relative metric, 0 (default)

The above is then deployed to an already existing primary tunnel such as the Primary Tunnel Configlet (IOS), page 44-2.

Primary Tunnel Configlet (IOS XR)

Configuration

- Service: MPLS-TE Primary Tunnel
- Feature: MPLS TE configlet (IOS XR) for deploying a primary tunnel
- Device configuration: CISCO12406 with IOS XR 3.7.0.

Configlets

IOS Device Configuration	Comments
! **Explicit path:** explicit-path name isctmp12-isctmp7-1 index 1 next-address ipv4 unicast 10.163.25.109 index 2 next-address ipv4 unicast 10.163.25.106 !	Create an explicit path with the specified next addresses, which indicate the strict path that the tunnel traverses. This explicit path is used by the primary tunnel detailed above.
! **Primary tunnel:** interface tunnel-te133 description CISCO ISC-P2 ipv4 unnumbered Loopback0 priority 0 0 signalled-bandwidth 13 destination 192.168.118.214 fast-reroute path-option 1 explicit name isctmp12-isctmp7-1 path-option 2 dynamic record-route !	Create a TE primary tunnel with the following attributes: - Destination 192.168.118.214 - TE encapsulation - Setup priority 0 - Hold priority 0 - Reserve 13 kbps from global pool - Tunnel affinity 0x0 - Explicit first path option - Dynamic second path option - Enable FRR for the tunnel
mpls ldp interface tunnel-te 133 !	Enable ldp (Label Distribution Protocol) on the tunnel interface. This command is generated because the policy has the 'mpls ip' flag enabled. This allows the TE tunnels to be used for MPLS VPN traffic

Bandwidth Protection Backup Tunnel Configlet (IOS XR)

Configuration

- Service: MPLS-TE with FRR (Fast Re-Route)
- Feature: MPLS TE configlet (IOS XR) for deploying a backup tunnel
- Device configuration: CISCO12406 with IOS XR 3.7.0.

Configlets

IOS Device Configuration	Comments
! **Explicit path:** explicit-path name isctmp8-isctmp9-1 index 1 next-address ipv4 unicast 10.163.25.109 index 2 next-address ipv4 unicast 10.163.25.106 ! ! **Backup tunnel:** interface tunnel-te1009 description CISCO ISC-B1411 ipv4 unnumbered Loopback0 priority 0 0 backup-bw 9600000 destination 10.163.24.131 path-option 1 explicit name isctmp8-isctmp9-1 record-route affinity 0 mask 0 ! mpls traffic-eng interface POS0/1/0/1 backup-path tunnel-te 1009	Create an explicit path with the specified next addresses, which indicate the strict path that the tunnel traverses. This explicit path is used by the backup tunnel detailed above. Create a TE backup tunnel with the following attributes: - Destination 10.163.24.131 - TE encapsulation - Protect any pool bw of 9600000 kbps - Setup and hold priority of 0 - Tunnel affinity 0x0 - Explicit first path option

Connectivity Protection Backup Tunnel Configlet (IOS XR)

Configuration

- Service: MPLS-TE with FRR (Fast Re-Route)
- Feature: MPLS TE configlet (IOS XR) for deploying a connectivity protection backup tunnel and its associated exclude address path
- Device configuration: CISCO12406 with IOS XR 3.7.0.

Configlets

IOS Device Configuration	Comments
! **Explicit path:** explicit-path name L96-excl index 1 exclude-address ipv4 unicast 192.168.1.42 ! !	Create an explicit path with an exclude address, which indicates the IP address the path should avoid. This explicit path is used by the backup tunnel detailed above.

! **Backup tunnel:**
interface tunnel-te1000
  description CISCO ISC-B2
  ipv4 unnumbered Loopback0
  destination 10.52.96.37
  priority 0 0
  no signalled-bandwidth 0
  path-option 1 explicit name L96-excl
  affinity 0 mask 0
  backup-bw sub-pool unlimited
  record-route
!
	Create a TE backup tunnel with the following attributes:
	- Destination 10.52.96.37
	- TE encapsulation
	- Setup priority 0
	- Hold priority 0
	- Explicit first path option
	- Tunnel affinity 0x0
	- An unlimited sub pool acts as backup bandwidth

mpls traffic-eng
  interface POS0/1/0/2
  backup-path tunnel-te 1000
!
	Tunnel 1000 protects interface POS0/1/0/2

TE Traffic Admission Configlet Using PBTS (IOS XR)

Configuration

- Service: TE Traffic Admission
- Feature: MPLS TE configlet (IOS XR) for admitting traffic using Policy-Based Tunnel Selection (PBTS)
- Device configuration: CISCO12406 with IOS XR 3.7.0.

Configlets

IOS Device Configuration	Comments

! **TE Traffic Admission using PBTS:**
interface tunnel-te133
  autoroute announce
  autoroute metric absolute 100
  policy-class 2
!
	Autoroute announce with absolute metric 100

The above is then deployed to an already existing primary tunnel such as the Primary Tunnel Configlet (IOS XR), page 44-7.

TE Traffic Admission Configlet (IOS XR)

Configuration

- Service: TE Traffic Admission
- Feature: MPLS TE configlet (IOS XR) for TE Traffic Admission
- Device configuration: CISCO12406 with IOS XR 3.7.0

Configlets

IOS XR Device Configuration	Comments

! **TE Traffic Admission Using Static Route:**
router static
  address-family ipv4 unicast
  1.2.3.4/32 tunnel-te 1000 123
  !
!
	Configuration of TE Traffic Admission
	on tunnel 1000 with static route

The above is then deployed to an already existing primary tunnel such as the Primary Tunnel Configlet (IOS XR), page 44-7.