Intelligent WAN Deployment Guide

September 2017

Procedure 2 Configure the routing protocol on the - dg p nghe w

Step 3: Configure EtherChannel member interfaces.

Configure the physical interfaces to tie to the logical portoup command. The number for the portoup must match.

Option 2: OSPF on the LAN

Step 1:

Configure **hold-queue in** and **hold-queue out** with a queue length of 4096 to avoid drops above and beyond the QoS policy drops.

```
interface GigabitEthernet0/0/3
 description INET1
 bandwidth 900000
 vrf forwarding IWAN-TRANSPORT-2
 ip address 192.168.146.10 255.255.255.0
 hold-queue 4096 in
 hold-queue 4096 out
 no shutdown
```

Step 2: Configure the VRF-specific default routing.

The VRF created for FVRF must have its own default rout ou

```
          IWAN-TRANSPORT-2vrfrfrfrvrfrfrfrv0 Tw T( vrf forwarding )T0.606 0 0.96 0  scn/0
```

Step 2:

Step 1:

```
        description
```

Step 12: Click Apply.

Step 15: Click the two down arrows. The NAT pane expands.

Step 16: Select **Add Automatic Address Translation Rules**.

Step 17: In the **Translated Address** list, choose the network object crea - viously. (Exa " outside-dm-vpn-2-ISPaض

Step 18: Select **Use one-to-one address translation**, and then click **OK**.

Step 19: N Lِ ؐ ed in the a q | , ah objectҧscBe-ئو e elisdsa lʼ o the n ۪ ct object listed in the l

Step 2:

Step 1: Configure an EIGRP process for DMVPN using EIGRP named mode on the spoke router.

```
router eigrp
```

Step 6: Add stub-site wan-interface.

You add one command to each af-interface tunnel in order to identify it as the stub-site wan-interface.

```
router eigrp IWAN-EIGRP
 address-family ipv4 unicast autonomous-system 400
  af-interface Tunnel100
   stub-site wan-interface
  exit-af-interface
 exit-address-family
```

Step 7: Block the tunnel addresses from being advertised on the WAN by using IP prefix lists and a route map.

```
ip prefix-list TUNNEL-ROUTES seq 10 permit 10.6.34.0/23
```

Table 18

Step 2: This procedure should be repeated for all data or voice subinterfaces.

```
interface [type][number].[sub-interface number]
 encapsulation dot1Q [dot1q VLAN tag]
 ip address [LAN network 1 address] [LAN network 1 netmask]
 ip helper-address 10.4.48.10
 ip pim sparse-mode
 ip pim dr-priority 110
 standby version 2
 standby 1 ip [LAN network 1 gateway address]
 standby 1 priority 110
 standby 1 preempt
 standby 1 authentication md5 key-string c1sco123
```

Example: Layer 2 link

```
 standby 1 ip 1
 standby version 2
 standby 1 priority 110
110
 ip helper-address 10.4.48.10
 standby 1 preempt
 string 110
 encapsulation dot1Q 110
 standby 1 authentication md5 key-string c1sco110
110 ip
```

```
ip pim dr-priority 110
ip pim sparse-mode
standby version 2
standby 1 ip 10.7.19.1
standby 1 priority 110
standby 1 preempt
standby 1 authentication md5 key-string c1sco123
```

```
 description Do not redistribute LOCAL SUBNETS into OSPF
 match ip address prefix-list LOCAL-SUBNETS

route-map REDIST-BGP-TO-OSPF permit 20
 description Identify routes redistributed from BGP
 set tag 1

route-map REDIST-OSPF-TO-BGP deny 10
 description Block all routes redistributed from BGP
 match tag 1

route-map REDIST-OSPF-TO-BGP permit 20
 description Redistribute all other routes
 match route-type internal
 match route-type external type-1
 match route-type external type-2
```

Procedure 4 Enable enhanced object tracking

The HSRP active re uώMא ʿ e regh-r l ᵀ ᵀ ξ ӿ l Mฅ]lhe vb] mא ʿ ying the HSRU vAN

Figure 7 Remote-site DMVPN second router configuration flowchart

Step 2:

Layer 2 EtherChannels are used to interconnect the router to the access layer in the most resilient method possible, unless the access layer device is a single fixed configuration switch, Otherwise a simple Layer 2 trunk between the router and switch is used.

In the access layer design, the remote sites use collapsed routing, with 802.1Q trunk interfaces to the LAN access layer. The VLAN numbering is locally significant only.

```
interface GigabitEthernet1/0/48
 description Link to RS12-2911-2 Gig0/1
```

Step 2: Configure IP settings for each subinterface.

This design uses an IP addressing convention with the default gateway router assigned an IP address and IP mask combination of N.N.N.1 255.255.255.0 where [illegible] terface.

Step 5: Create a route map to block the routes with a tag value of 1.

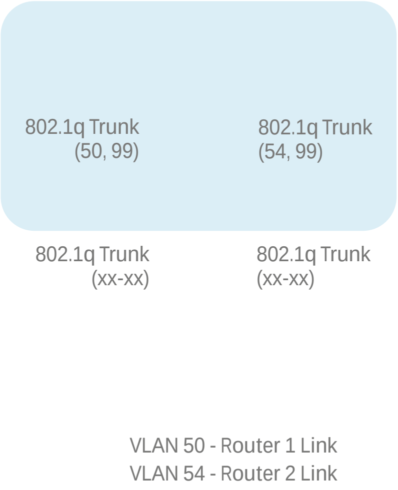
The sub-interface configured on the router corresponds to a VLAN interface on the distribution-layer switch.

Step 3: Configure the throughput delay on the LAN interface.

At the remote where there are multiple routers, the interface throughput delay setting should be set to influence

```
neighbor
```

Figure 10 WAN remote-site: Connection to distribution layer



Step 5:

Deploying IWAN Performance Routing

Performance Routing Version 3 (PfRv3) consists of two major Cisco IOS components, an MC and a BR. The MC defines the policies and applies them to various traffic classes that traverse the BR systems. The MC can be configured to learn and control traffic classes on the network.

- The MC is the policy decision-maker. At a large site, such as a data center or campus, the MC is a standalone router. For smaller locations, the MC is tm ≈ ʿ ed ط on th

Next, configure the EtherChannel. Access mode interfaces are used for the connection to the hub MCs.

Step 4: Assign the VLAN created at the beginning of the procedure to the interface. When using EtherChannel, the port-channel number must match the channel group configured in Step 3.

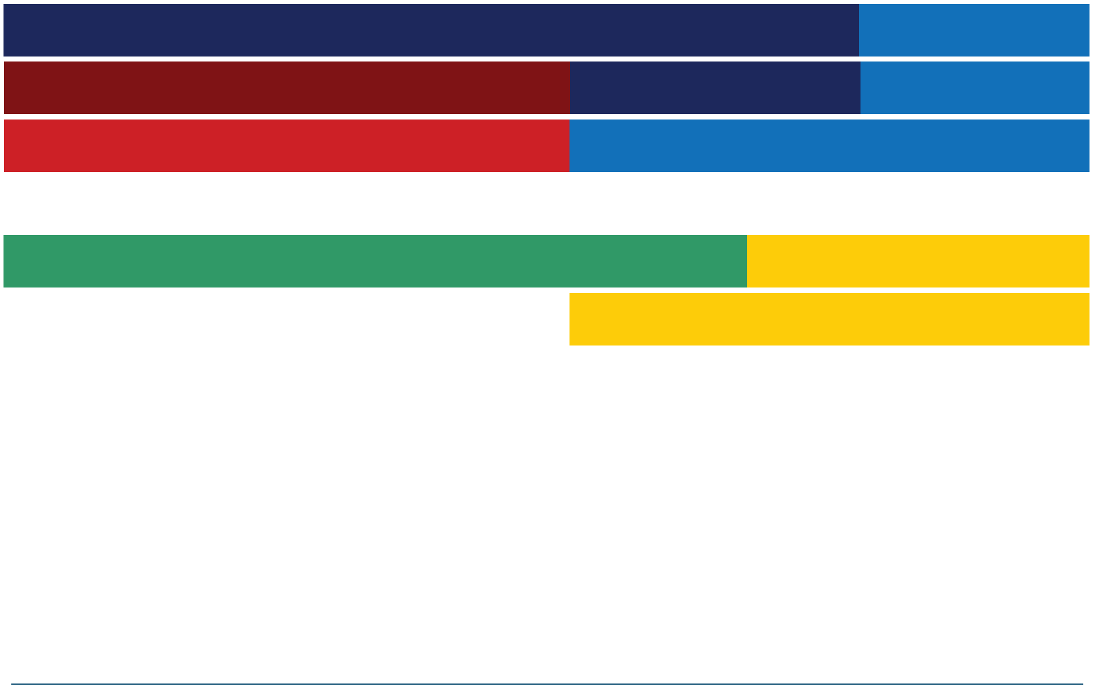
```
interface Port-channel 21
 description HY-MC-CSR1000v-1
 switchport trunk encapsulation dot1q
 switchport trunk allowed vlan 350
 switchport mode trunk
 logging event trunk-status
 logging event bundle-status
 spanning-tree portfast trunk
 no shutdown
```

Step 5: Allow the routing protocol to form neighbor relationships across the vlan interface.

```
router eigrp IWAN-EIGRP
 address-family ipv4 unicast autonomous-system 400
  af-interface Vlan350
   no passive-interface
   authentication mode md5
   authentication key-chain LAN-KEY
  exit-af-interface
 exit-address-family
```

Step 1:

Figure 13 QoS class model mapping: Tunnel mappings must match provider



vice. After you have configured the **class-map** command, you define specific values, such as DSCP and protocols to match with the match command.

Procedure 1 Configure per-tunnel QoS NHRP policy on remote-site routers

This procedure configures the remote-site router to reference the QoS policy configured on the hub site routers.

Appendix A: Product List

To view the full list of IWAN-supported routers for this version of the CVD, see

Example

```
crypto ikev2 policy AES/GCM/256
 match fvrf any
 proposal AES/GCM/256
```

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