Newer Design Guide Available

Cisco Smart Business Architecture has become part of the Cisco Validated Designs program.

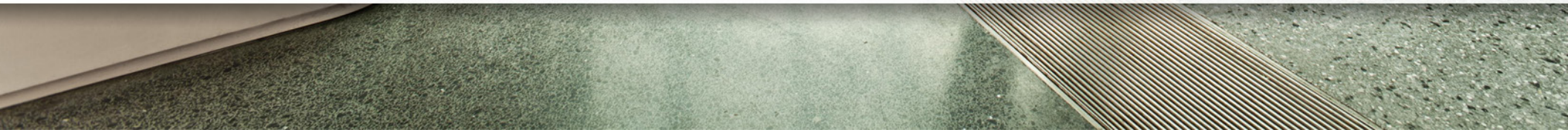
For up-to-date guidance on the designs described in this guide, see http://cvddocs.com/fw/Aug13-330

For information about the Cisco Validated Design program, go to http://www.cisco.com/go/cvd

VPN WAN Configuration Files Guide

SMART BUSINESS ARCHITECTURE

February 2013 Series



Preface

Who Should Read This Guide

This Cisco® Smart Business Architecture (SBA) guide is for people who fill a variety of roles:

- Systems engineers who need standard procedures for implementing solutions
- Project managers who create statements of work for Cisco SBA implementations
- Sales partners who sell new technology or who create implementation documentation
- Trainers who need material for classroom instruction or on-the-job training

In general, you can also use Cisco SBA guides to improve consistency among engineers and deployments, as well as to improve scoping and costing of deployment jobs.

Release Series

Cisco strives to update and enhance SBA guides on a regular basis. As we develop a series of SBA guides, we test them together, as a complete system. To ensure the mutual compatibility of designs in Cisco SBA guides, you should use guides that belong to the same series.

The Release Notes for a series provides a summary of additions and changes made in the series.

All Cisco SBA guides include the series name on the cover and at the bottom left of each page. We name the series for the month and year that we release them, as follows:

month year Series

For example, the series of guides that we released in February 2013 is the "February Series".

You can find the most recent series of SBA guides at the following sites:

Customer access: http://www.cisco.com/go/sba

Partner access: http://www.cisco.com/go/sbachannel

How to Read Commands

Many Cisco SBA guides provide specific details about how to configure Cisco network devices that run Cisco IOS, Cisco NX-OS, or other operating systems that you configure at a command-line interface (CLI). This section describes the conventions used to specify commands that you must enter.

Commands to enter at a CLI appear as follows:

```
configure terminal
```

Commands that specify a value for a variable appear as follows:

```
ntp server 10.10.48.17
```

Commands with variables that you must define appear as follows:

```
class-map [highest class name]
```

Commands shown in an interactive example, such as a script or when the command prompt is included, appear as follows:

```
Router# enable
```

Long commands that line wrap are underlined. Enter them as one command:

```
wrr-queue random-detect max-threshold 1 100 100 100 100 100
100 100 100
```

Noteworthy parts of system output or device configuration files appear highlighted, as follows:

```
interface Vlan64
  ip address 10.5.204.5 255.255.255.0
```

Comments and Questions

If you would like to comment on a guide or ask questions, please use the SBA feedback form.

If you would like to be notified when new comments are posted, an RSS feed is available from the SBA customer and partner pages.

Table of Contents

What's In This SBA Guide

Cisco SBA Borderless Networks

Cisco SBA helps you design and quickly deploy a full-service business network. A Cisco SBA deployment is prescriptive, out-of-the-box, scalable, and flexible.

Cisco SBA incorporates LAN, WAN, wireless, security, data center, application optimization, and unified communication technologies—tested together as a complete system. This component-level approach simplifies system integration of multiple technologies, allowing you to select solutions that solve your organization's problems—without worrying about the technical complexity.

Cisco SBA Borderless Networks is a comprehensive network design targeted at organizations with up to 10,000 connected users. The SBA Borderless Network architecture incorporates wired and wireless local area network (LAN) access, wide-area network (WAN) connectivity, WAN application optimization, and Internet edge security infrastructure.

Route to Success

To ensure your success when implementing the designs in this guide, you should first read any guides that this guide depends upon—shown to the left of this guide on the route below. As you read this guide, specific prerequisites are cited where they are applicable.

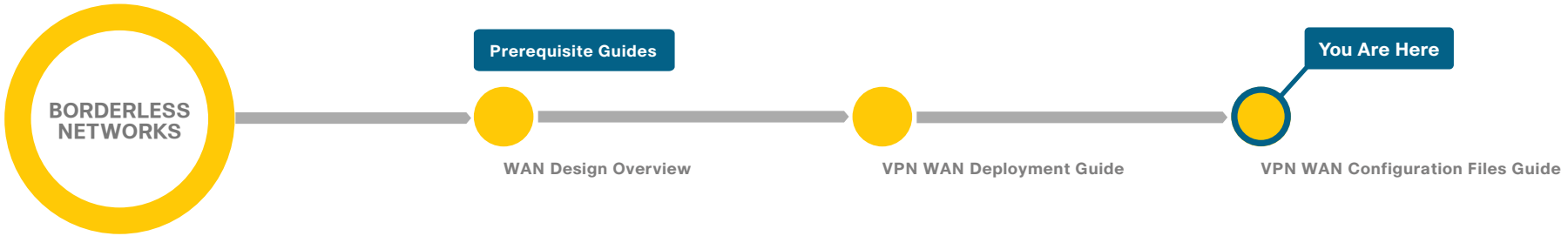
About This Guide

This *configuration files guide* provides, as a comprehensive reference, the complete network device configurations that are implemented in a Cisco SBA deployment guide.

You can find the most recent series of Cisco SBA guides at the following sites:

Customer access: http://www.cisco.com/go/sba

Partner access: http://www.cisco.com/go/sbachannel



Introduction

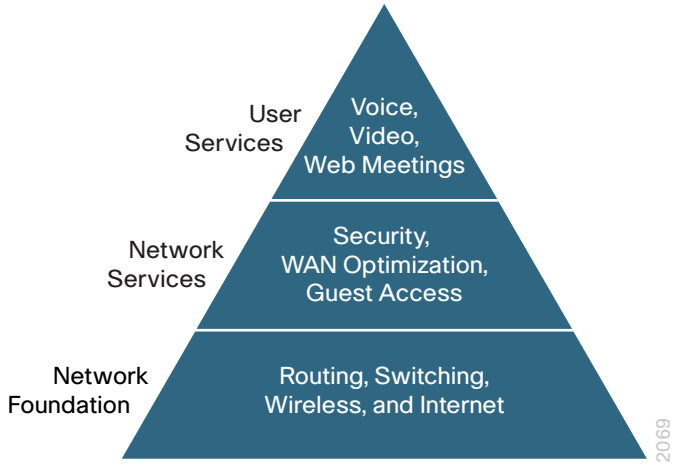
For Cisco partners and customers with up to 10,000 connected users, Cisco has created an "out-of-the-box" deployment that is simple, fast, affordable, scalable, and flexible. It is designed it to be easy to configure, deploy, and manage. The simplicity of this deployment, though, belies the depth and breadth of the architecture.

The Cisco Smart Business Architecture (SBA) WAN is documented in a single design guide, and there are deployment guides and configuration files guides for each of the three key WAN technologies: Multiprotocol Label Switching (MPLS) WAN, Layer 2 WAN and VPN WAN.

Cisco SBA is a prescriptive reference design that provides step-by-step instructions for the deployment of the products in the design. It is based on best practice principles. Based on feedback from customers and partners, Cisco has developed a solid network foundation as a flexible platform that does not require reengineering to include additional network or user services.

Some of the base concepts referenced in this guide are covered in the SBA design and deployment guides. Those documents should be reviewed first.

Figure 1 - Smart Business Architecture model



This deployment guide has been architected to make your life a little bit—maybe even a lot—smoother. This architecture:

- Provides a solid foundation.
- Makes deployment fast and easy.
- Accelerates the ability to easily deploy additional services.
- Avoids the need for re-engineering of the core network.

Using the Deployment Guides

To reflect our ease-of-use principle, Cisco SBA has been divided into three sections: LAN, WAN, and Internet edge. Each section has one or more deployment guides and configuration guides. Each guide is organized into modules. You can start at the beginning or jump to any module. Each part of the guide is designed to stand alone, so you can deploy the Cisco technology for that section without having to follow the previous module.

Each deployment guide starts with a Business Problem and Architecture Overview. These sections cover the basics of the deployment guide, the value for you and your customer, and the broad-stroke features and benefits of this compelling design. Each then has different modules depending on the network components being covered.

The *VPN WAN Deployment Guide* has the following sections:

- Deploying a DMVPN WAN
- Deploying a WAN Remote-Site Distribution Layer
- Deploying WAN Quality of Service

Using the VPN WAN Configuration Files Guide

This document provides the available configuration files for the products used in the *VPN WAN Deployment Guide*. It is a companion document to the deployment guide as a reference for engineers who are evaluating or deploying Cisco SBA.

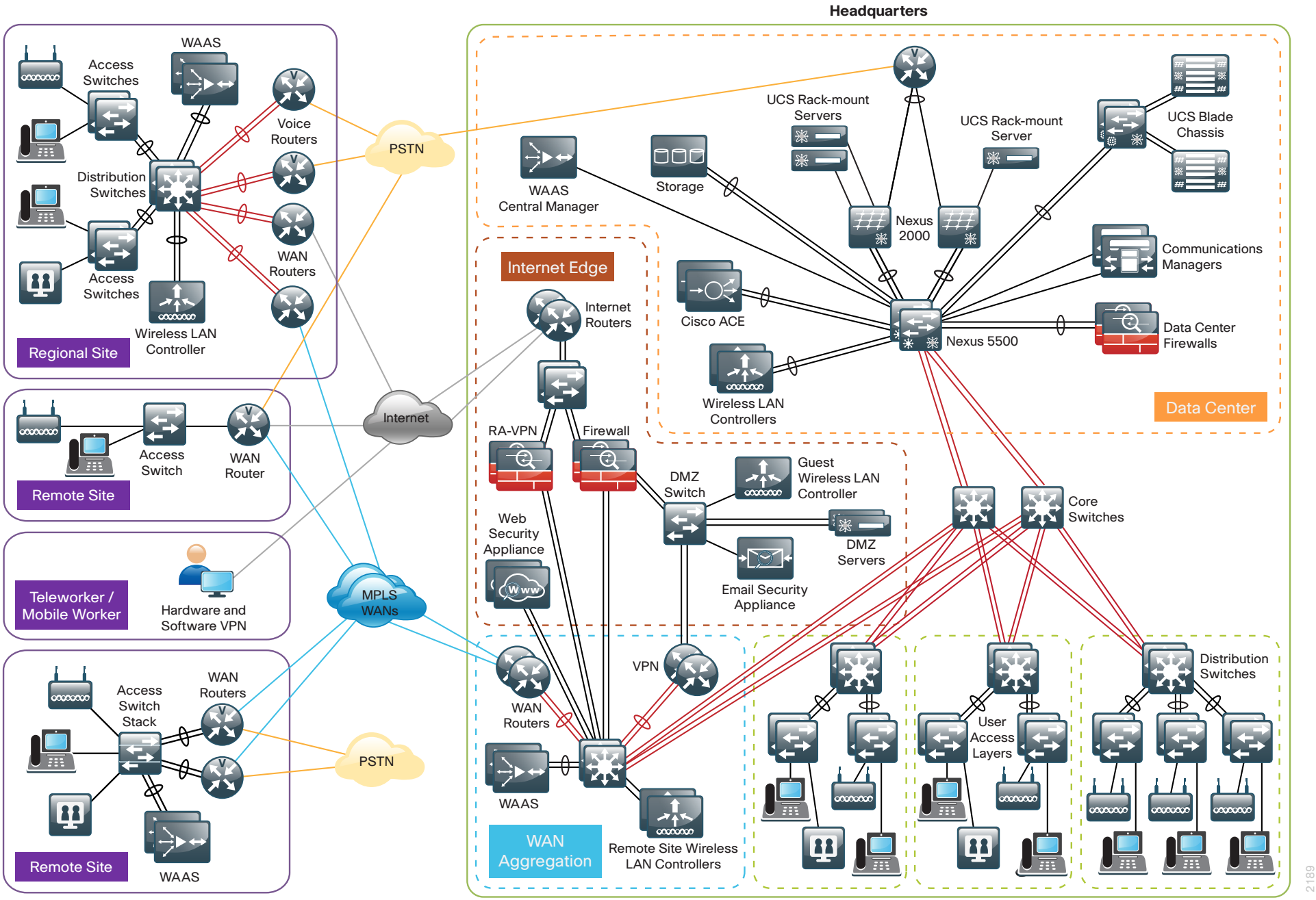
Both the *VPN WAN Deployment Guide* and the *VPN WAN Configuration Files Guide* provide the complete list of products used in the lab testing of this design.

Graphical Interface Management

There are products in this design where we have omitted the configuration file. Those products have browser-based graphical configuration tools. For step-by-step instructions on configuring those products, please refer to the *VPN WAN Deployment Guide* at http://www.cisco.com/go/sba.

Notes

Figure 2 - Cisco SBA Overview



Product List

WAN Aggregation

Functional Area	Product Description	Part Numbers	Software
WAN-aggregation Router	Aggregation Services 1002 Router	ASR1002-5G-VPN/K9	IOS-XE 15.2(2)S2 Advanced Enterprise license
	Aggregation Services 1001 Router	ASR1001-2.5G-VPNK9	
WAN-aggregation Router	Cisco 3945 Security Bundle w/SEC license PAK	CISCO3945-SEC/K9	15.1(4)M5 securityk9 license datak9 license
	Cisco 3925 Security Bundle w/SEC license PAK	CISCO3925-SEC/K9	
	Data Paper PAK for Cisco 3900 series	SL-39-DATA-K9	

WAN Remote Site

Functional Area	Product Description	Part Numbers	Software
Modular WAN Remote-site Router	Cisco 3945 Voice Sec. Bundle, PVDM3-64, UC and SEC License PAK	C3945-VSEC/K9	15.1(4)M5 securityk9 license datak9 license
	Cisco 3925 Voice Sec. Bundle, PVDM3-64, UC and SEC License PAK	C3925-VSEC/K9	
	Data Paper PAK for Cisco 3900 series	SL-39-DATA-K9	
	Cisco 2951 Voice Sec. Bundle, PVDM3-32, UC and SEC License PAK	C2951-VSEC/K9	
	Cisco 2921 Voice Sec. Bundle, PVDM3-32, UC and SEC License PAK	C2921-VSEC/K9	
	Cisco 2911 Voice Sec. Bundle, PVDM3-32, UC and SEC License PAK	C2911-VSEC/K9	
	Data Paper PAK for Cisco 2900 series	SL-29-DATA-K9	
	1941 WAAS Express only Bundle	C1941-WAASX-SEC/K9	
	Data Paper PAK for Cisco 1900 series	SL-19-DATA-K9	

Internet Edge

Functional Area	Product Description	Part Numbers	Software
Firewall	Cisco ASA 5545-X IPS Edition - security appliance	ASA5545-IPS-K9	ASA 9.0(1) IPS 7.1(6)E4
	Cisco ASA 5525-X IPS Edition - security appliance	ASA5525-IPS-K9	
	Cisco ASA 5515-X IPS Edition - security appliance	ASA5515-IPS-K9	
	Cisco ASA 5512-X IPS Edition - security appliance	ASA5512-IPS-K9	
	Cisco ASA5512-X Security Plus license	ASA5512-SEC-PL	
	Firewall Management	ASDM	7.0(2)

Internet Edge LAN

Functional Area	Product Description	Part Numbers	Software
DMZ Switch	Cisco Catalyst 3750-X Series Stackable 24 Ethernet 10/100/1000 ports	WS-C3750X-24T-S	15.0(2)SE IP Base license

LAN Access Layer

Functional Area	Product Description	Part Numbers	Software
Modular Access Layer Switch	Cisco Catalyst 4507R+E 7-slot Chassis with 48Gbps per slot	WS-C4507R+E	3.3.0.SG(15.1-1SG) IP Base license
	Cisco Catalyst 4500 E-Series Supervisor Engine 7L-E	WS-X45-SUP7L-E	
	Cisco Catalyst 4500 E-Series 48 Ethernet 10/100/1000 (RJ45) PoE+ ports	WS-X4648-RJ45V+E	
	Cisco Catalyst 4500 E-Series 48 Ethernet 10/100/1000 (RJ45) PoE+,UPoE ports	WS-X4748-UPOE+E	
Stackable Access Layer Switch	Cisco Catalyst 3750-X Series Stackable 48 Ethernet 10/100/1000 PoE+ ports	WS-C3750X-48PF-S	15.0(2)SE IP Base license
	Cisco Catalyst 3750-X Series Stackable 24 Ethernet 10/100/1000 PoE+ ports	WS-C3750X-24P-S	
	Cisco Catalyst 3750-X Series Two 10GbE SFP+ and Two GbE SFP ports network module	C3KX-NM-10G	
	Cisco Catalyst 3750-X Series Four GbE SFP ports network module	C3KX-NM-1G	

Functional Area	Product Description	Part Numbers	Software
Standalone Access Layer Switch	Cisco Catalyst 3560-X Series Standalone 48 Ethernet 10/100/1000 PoE+ ports	WS-C3560X-48PF-S	15.0(2)SE IP Base license
	Cisco Catalyst 3560-X Series Standalone 24 Ethernet 10/100/1000 PoE+ ports	WS-C3560X-24P-S	
	Cisco Catalyst 3750-X Series Two 10GbE SFP+ and Two GbE SFP ports network module	C3KX-NM-10G	
	Cisco Catalyst 3750-X Series Four GbE SFP ports network module	C3KX-NM-1G	
Stackable Access Layer Switch	Cisco Catalyst 2960-S Series 48 Ethernet 10/100/1000 PoE+ ports and Two 10GbE SFP+ Uplink ports	WS-C2960S-48FPD-L	15.0(2)SE LAN Base license
	Cisco Catalyst 2960-S Series 48 Ethernet 10/100/1000 PoE+ ports and Four GbE SFP Uplink ports	WS-C2960S-48FPS-L	
	Cisco Catalyst 2960-S Series 24 Ethernet 10/100/1000 PoE+ ports and Two 10GbE SFP+ Uplink ports	WS-C2960S-24PD-L	
	Cisco Catalyst 2960-S Series 24 Ethernet 10/100/1000 PoE+ ports and Four GbE SFP Uplink ports	WS-C2960S-24PS-L	
	Cisco Catalyst 2960-S Series Flexstack Stack Module	C2960S-STACK	

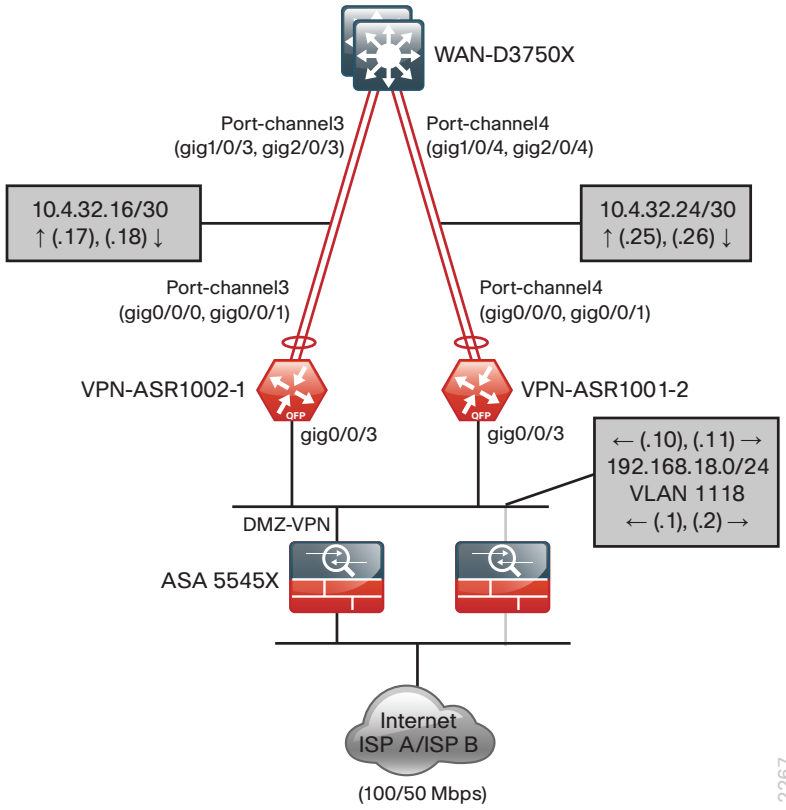
LAN Distribution Layer

Functional Area	Product Description	Part Numbers	Software
Modular Distribution Layer Virtual Switch Pair	Cisco Catalyst 6500 E-Series 6-Slot Chassis	WS-C6506-E	15.0(1)SY1 IP Services license
	Cisco Catalyst 6500 VSS Supervisor 2T with 2 ports 10GbE and PFC4	VS-S2T-10G	
	Cisco Catalyst 6500 16-port 10GbE Fiber Module w/DFC4	WS-X6816-10G-2T	
	Cisco Catalyst 6500 24-port GbE SFP Fiber Module w/DFC4	WS-X6824-SFP-2T	
	Cisco Catalyst 6500 4-port 40GbE/16-port 10GbE Fiber Module w/DFC4	WS-X6904-40G-2T	
	Cisco Catalyst 6500 4-port 10GbE SFP+ adapter for WX-X6904-40G module	CVR-CFP-4SFP10G	
Modular Distribution Layer Switch	Cisco Catalyst 4507R+E 7-slot Chassis with 48Gbps per slot	WS-C4507R+E	3.3.0.SG(15.1-1SG) Enterprise Services license
	Cisco Catalyst 4500 E-Series Supervisor Engine 7-E, 848Gbps	WS-X45-SUP7-E	
	Cisco Catalyst 4500 E-Series 24-port GbE SFP Fiber Module	WS-X4624-SFP-E	
	Cisco Catalyst 4500 E-Series 12-port 10GbE SFP+ Fiber Module	WS-X4712-SFP+E	
Stackable Distribution Layer Switch	Cisco Catalyst 3750-X Series Stackable 12 GbE SFP ports	WS-C3750X-12S-E	15.0(2)SE IP Services license
	Cisco Catalyst 3750-X Series Two 10GbE SFP+ and Two GbE SFP ports network module	C3KX-NM-10G	
	Cisco Catalyst 3750-X Series Four GbE SFP ports network module	C3KX-NM-1G	

WAN-Aggregation Devices

This section includes configuration files corresponding to the Dual DMVPN and DMVPN Only design models as referenced in Figure 3, This section also includes configuration files corresponding to the DMVPN components of both the DMVPN Backup Dedicated design models as referenced in Figure 4 and Figure 50.

Figure 3 - WAN-aggregation design—Dual DMVPN and DMVPN Only

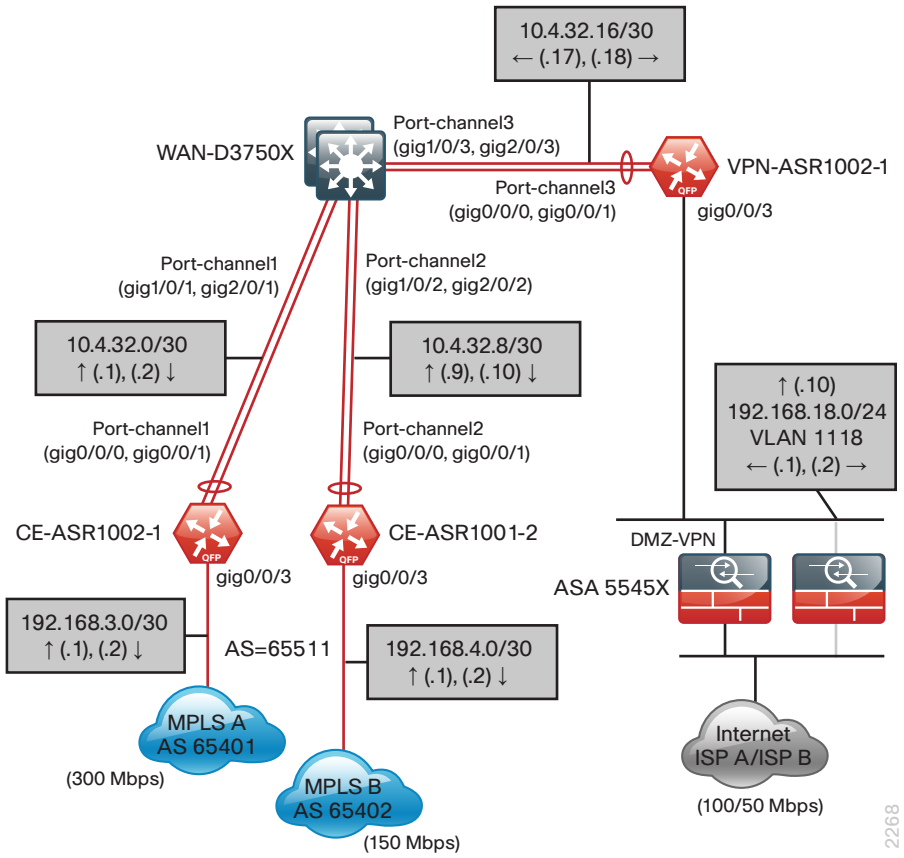


The following table provides the loopback addresses for the WAN aggregation devices in the Dual DMVPN and DMVPN Only design models, shown in the preceding figure.

Table 1 - Loopback addresses

Hostname	Loopback0
WAN-D3750X	10.4.32.240/32
VPN-ASR1002-1	10.4.32.243/32
VPN-ASR1001-2	10.4.32.244/32

Figure 4 - WAN-aggregation design—DMVPN Backup Dedicated (MPLS WAN)

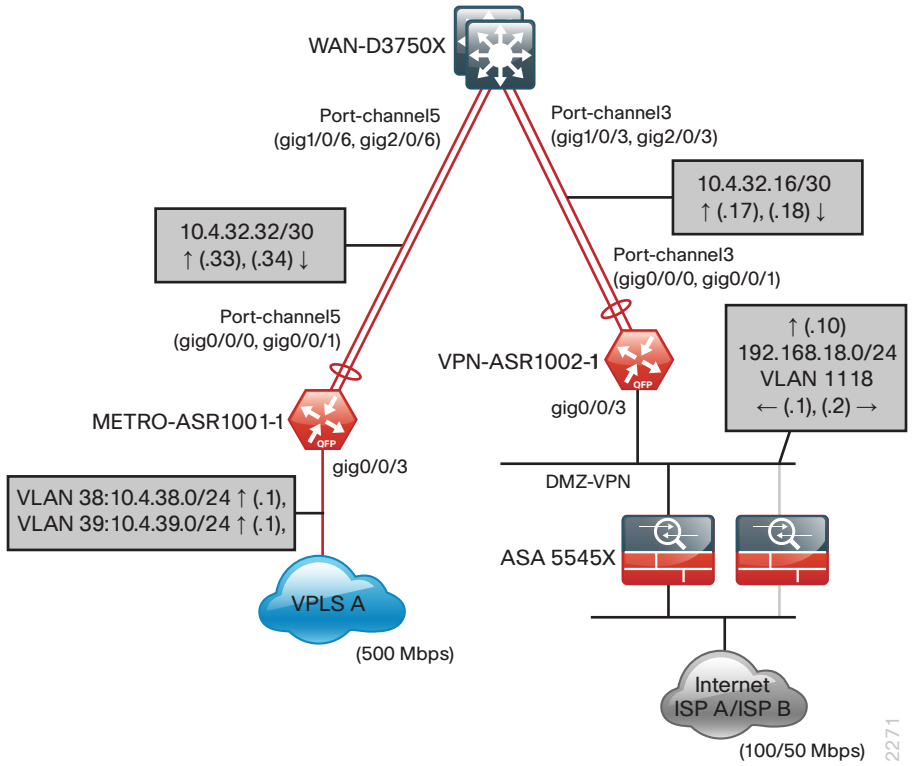


The following table provides the loopback addresses for the WAN aggregation devices in the DMVPN Backup Dedicated (MPLS WAN) design model, shown in the preceding figure.

Table 2 - Loopback addresses

Hostname	Loopback0
WAN-D3750X	10.4.32.240/32
CE-ASR1002-1	10.4.32.241/32
CE-ASR1001-2	10.4.32.242/32
VPN-ASR1002-1	10.4.32.243/32

Figure 5 - WAN-aggregation design—DMVPN Backup Dedicated (Layer 2 WAN)



The following table provides the loopback addresses for the WAN aggregation devices in the DMVPN Backup Dedicated (Layer 2 WAN) design model, shown in the preceding figure.

Table 3 - Loopback addresses

Hostname	Loopback0
WAN-D3750X	10.4.32.240/32
METRO-ASR1001-1	10.4.32.245/32
VPN-ASR1002-1	10.4.32.243/32

The following table provides a summary of the various distribution layer switch device interconnections to other WAN-aggregation components.

Table 4 - Dual DMVPN distribution layer switch port channel information

Port channel	Member interfaces	Layer3/Layer2	Connected device
3	gig1/0/3 gig2/0/3	Layer 3	VPN-ASR1002-1
4	gig1/0/4 gig2/0/4	Layer 3	VPN-ASR1001-2

WAN-D3750X

```
version 15.0
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname WAN-D3750X
!
boot-start-marker
boot-end-marker
!
!
enable secret 5 $1$ssq/$J5zW2nln0tp6NsQDx48yK1
!
username admin password 7 121A540411045D5679
aaa new-model
!
!
aaa group server tacacs+ TACACS-SERVERS
 server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
!
!
!
!
aaa session-id common
clock timezone PST -8 0
clock summer-time PDT recurring
switch 1 provision ws-c3750x-24
switch 2 provision ws-c3750x-24
stack-mac persistent timer 0
system mtu routing 1500
!
ip routing
!
!
!
ip domain-name cisco.local
ip name-server 10.4.48.10
ip multicast-routing distributed
vtp mode transparent
udld enable

!
mls qos map policed-dscp  0 10 18 24 46 to 8
mls qos map cos-dscp 0 8 16 24 32 46 48 56
mls qos srr-queue input bandwidth 70 30
mls qos srr-queue input threshold 1 80 90
mls qos srr-queue input priority-queue 2 bandwidth 30
mls qos srr-queue input cos-map queue 1 threshold 2 3
mls qos srr-queue input cos-map queue 1 threshold 3 6 7
mls qos srr-queue input cos-map queue 2 threshold 1 4
mls qos srr-queue input dscp-map queue 1 threshold 2 24
mls qos srr-queue input dscp-map queue 1 threshold 3 48 49 50 51
52 53 54 55
mls qos srr-queue input dscp-map queue 1 threshold 3 56 57 58 59
```

```
60 61 62 63
mls qos srr-queue input dscp-map queue 2 threshold 3 32 33 40 41
42 43 44 45
mls qos srr-queue input dscp-map queue 2 threshold 3 46 47
mls qos srr-queue output cos-map queue 1 threshold 3 4 5
mls qos srr-queue output cos-map queue 2 threshold 1 2
mls qos srr-queue output cos-map queue 2 threshold 2 3
mls qos srr-queue output cos-map queue 2 threshold 3 6 7
mls qos srr-queue output cos-map queue 3 threshold 3 0
mls qos srr-queue output cos-map queue 4 threshold 3 1
mls qos srr-queue output dscp-map queue 1 threshold 3 32 33 40 41
42 43 44 45
mls qos srr-queue output dscp-map queue 1 threshold 3 46 47
mls qos srr-queue output dscp-map queue 2 threshold 1 16 17 18 19
20 21 22 23
mls qos srr-queue output dscp-map queue 2 threshold 1 26 27 28 29
30 31 34 35
mls qos srr-queue output dscp-map queue 2 threshold 1 36 37 38 39
mls qos srr-queue output dscp-map queue 2 threshold 2 24
mls qos srr-queue output dscp-map queue 2 threshold 3 48 49 50 51
52 53 54 55
mls qos srr-queue output dscp-map queue 2 threshold 3 56 57 58 59
60 61 62 63
mls qos srr-queue output dscp-map queue 3 threshold 3 0 1 2 3 4 5
6 7
mls qos srr-queue output dscp-map queue 4 threshold 1 8 9 11 13
15
mls qos srr-queue output dscp-map queue 4 threshold 2 10 12 14
mls qos queue-set output 1 threshold 1 100 100 50 200
mls qos queue-set output 1 threshold 2 125 125 100 400
mls qos queue-set output 1 threshold 3 100 100 100 3200
mls qos queue-set output 1 threshold 4 60 150 50 200
mls qos queue-set output 1 buffers 15 25 40 20
mls qos
!

license boot level ipservices
license boot level ipservices switch 2
!
!
!
!
spanning-tree mode rapid-pvst
spanning-tree portfast bpduguard default
spanning-tree extend system-id
spanning-tree vlan 1-4094 priority 24576
!
!
!
port-channel load-balance src-dst-ip
!
vlan internal allocation policy ascending
!
!
ip ssh source-interface Loopback0
ip ssh version 2
!
!
macro name EgressQoS
 mls qos trust dscp
 queue-set 2
 srr-queue bandwidth share 1 30 35 5
 priority-queue out
@
!
!
interface Loopback0
 ip address 10.4.32.240 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel1
 description connection to CE-ASR1002-1
 no switchport
 ip address 10.4.32.1 255.255.255.252
```

```
 ip pim sparse-mode
 logging event link-status
 carrier-delay msec 0
!
interface Port-channel2
 description connection to CE-ASR1001-2
 no switchport
 ip address 10.4.32.9 255.255.255.252
 ip pim sparse-mode
 logging event link-status
 carrier-delay msec 0
!
interface Port-channel3
 description VPN-ASR1002-1
 no switchport
 ip address 10.4.32.17 255.255.255.252
 ip pim sparse-mode
 logging event link-status
 carrier-delay msec 0
!
interface Port-channel4
 description VPN-ASR1002-1
 no switchport
 ip address 10.4.32.21 255.255.255.252
 ip pim sparse-mode
 logging event link-status
 carrier-delay msec 0
!
interface Port-channel5
 description METRO-ASR1000-1
 no switchport
 ip address 10.4.32.33 255.255.255.252
 ip pim sparse-mode
 logging event link-status
 carrier-delay msec 0
!
interface FastEthernet0
 no ip address
 no ip route-cache
 shutdown
!
interface GigabitEthernet1/0/1
 description CE-ASR1002-1
 no switchport
 no ip address
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 carrier-delay msec 0
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
 channel-protocol lacp
 channel-group 1 mode active
!
interface GigabitEthernet1/0/2
 description CE-ASR1001-2
 no switchport
 no ip address
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 carrier-delay msec 0
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
 channel-protocol lacp
 channel-group 2 mode active
!
interface GigabitEthernet1/0/3
```

```
 description VPN-ASR1002-1 Gig0/0/0
 no switchport
 no ip address
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 carrier-delay msec 0
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
 channel-protocol lacp
 channel-group 3 mode active
!
interface GigabitEthernet1/0/4
 description VPN-ASR1002-2 Gig0/0/0
 no switchport
 no ip address
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 carrier-delay msec 0
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
 channel-protocol lacp
 channel-group 4 mode active
!
interface GigabitEthernet1/0/6
 description METRO-ASR1000-1 Gig0/0/1
 no switchport
 no ip address
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 carrier-delay msec 0
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
 channel-group 5 mode on
!
interface TenGigabitEthernet1/1/1
 description connection to C6509-2 Te4/6
 no switchport
 ip address 10.4.40.46 255.255.255.252
 ip pim sparse-mode
 ip summary-address eigrp 100 10.4.32.0 255.255.248.0
 ip summary-address eigrp 100 10.5.0.0 255.255.0.0
 logging event link-status
 carrier-delay msec 0
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
!
interface GigabitEthernet2/0/1
 description CE-ASR1002-1
 no switchport
 no ip address
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 carrier-delay msec 0
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
```

```
 channel-protocol lacp
 channel-group 1 mode active
!
interface GigabitEthernet2/0/2
 description CE-ASR1001-2
 no switchport
 no ip address
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 carrier-delay msec 0
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
 channel-protocol lacp
 channel-group 2 mode active
!
interface GigabitEthernet2/0/3
 description VPN-ASR1002-1 Gig0/0/1
 no switchport
 no ip address
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 carrier-delay msec 0
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
 channel-protocol lacp
 channel-group 3 mode active
!
interface GigabitEthernet2/0/4
 description VPN-ASR1002-2 Gig0/0/1
 no switchport
 no ip address
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 carrier-delay msec 0
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
 channel-protocol lacp
 channel-group 4 mode active
!
interface GigabitEthernet2/0/6
 description METRO-ASR1000-1 Gig0/0/0
 no switchport
 no ip address
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 carrier-delay msec 0
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
 channel-group 5 mode on
!
interface TenGigabitEthernet2/1/1
 description connection to C6509-1 Te4/6
 no switchport
 ip address 10.4.40.42 255.255.255.252
 ip pim sparse-mode
 ip summary-address eigrp 100 10.4.32.0 255.255.248.0
 ip summary-address eigrp 100 10.5.0.0 255.255.0.0
 logging event link-status
```

```
 carrier-delay msec 0
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
!
interface Vlan1
 no ip address
 shutdown
!
!
router eigrp 100
 network 10.4.0.0 0.1.255.255
 passive-interface default
 no passive-interface TenGigabitEthernet2/1/1
 no passive-interface TenGigabitEthernet1/1/1
 no passive-interface Port-channel1
 no passive-interface Port-channel2
 no passive-interface Port-channel3
 no passive-interface Port-channel4
 no passive-interface Port-channel5
 nsf
!
!
no ip http server
ip http authentication aaa
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!
ip pim autorp listener
ip pim register-source Loopback0
ip tacacs source-interface Loopback0
!
!
logging 10.4.48.35
access-list 55 permit 10.4.48.0 0.0.0.255
!
snmp-server community cisco RO 55
snmp-server community cisco123 RW 55
snmp-server trap-source Loopback0
tacacs server TACACS-SERVER-1
 address ipv4 10.4.48.15
 key 7 03375E08140A35674B10
!
!
!
line con 0
line vty 0 4
 exec-timeout 0 0
 transport preferred none
 transport input ssh
line vty 5 15
 exec-timeout 0 0
 transport preferred none
 transport input ssh
!
!
ntp source Loopback0
ntp server 10.4.48.17
end
```

VPN-ASR1002-1

```
version 15.2
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
no platform punt-keepalive disable-kernel-core
!
hostname VPN-ASR1002-1
!
!
vrf definition Mgmt-intf
 !
```

```
 address-family ipv4
 exit-address-family
 !
 address-family ipv6
 exit-address-family
!
enable secret 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrsw
!
aaa new-model
!
!
aaa group server tacacs+ TACACS-SERVERS
 server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
!
!
!
!
aaa session-id common
clock timezone PST -8 0
clock summer-time PDT recurring
!
!
ip vrf INET-PUBLIC
 rd 65512:1
!
!
!
ip domain name cisco.local
ip multicast-routing distributed
!
!
!
!
multilink bundle-name authenticated
!
!
!
!
!
!
!
username admin password 7 110A4816141D5A5E57
!
redundancy
 mode none
!
!
!
!
!
!
ip ssh source-interface Loopback0
ip ssh version 2
!
class-map match-any DATA
 match dscp af21
 match ip dscp af21
class-map match-any INTERACTIVE-VIDEO
 match dscp cs4  af41
class-map match-any CRITICAL-DATA
 match dscp cs3  af31
class-map match-any VOICE
 match dscp ef
class-map match-any SCAVENGER
 match dscp cs1  af11
 match ip dscp cs1  af11
class-map match-any NETWORK-CRITICAL
 match dscp cs2  cs6
 match ip dscp cs2  cs6
```

```
 match access-group name ISAKMP
!
policy-map WAN
 class VOICE
  priority percent 10
 class INTERACTIVE-VIDEO
  priority percent 23
 class CRITICAL-DATA
  bandwidth percent 15
  random-detect dscp-based
 class DATA
  bandwidth percent 19
  random-detect dscp-based
 class SCAVENGER
  bandwidth percent 5
 class NETWORK-CRITICAL
  bandwidth percent 3
 class class-default
  bandwidth percent 25
  random-detect
policy-map WAN-INTERFACE-G0/0/3
 class class-default
  shape average 100000000
   service-policy WAN
!
!
!
crypto keyring DMVPN-KEYRING vrf INET-PUBLIC
  pre-shared-key address 0.0.0.0 0.0.0.0 key cisco123
!
crypto isakmp policy 10
 encr aes 256
 authentication pre-share
 group 2
crypto isakmp profile FVRF-ISAKMP-INET-PUBLIC
   keyring DMVPN-KEYRING
   match identity address 0.0.0.0 INET-PUBLIC
!
!
crypto ipsec transform-set AES256/SHA/TRANSPORT esp-aes 256 esp-
sha-hmac
 mode transport
!
crypto ipsec profile DMVPN-PROFILE
 set transform-set AES256/SHA/TRANSPORT
 set isakmp-profile FVRF-ISAKMP-INET-PUBLIC
!
!
!
!
!
!
!
interface Loopback0
 ip address 10.4.32.243 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel3
 ip address 10.4.32.18 255.255.255.252
 ip pim sparse-mode
 no negotiation auto
!
interface Tunnel10
 bandwidth 100000
 ip address 10.4.34.1 255.255.254.0
 no ip redirects
 ip mtu 1400
 ip hello-interval eigrp 200 20
 ip hold-time eigrp 200 60
 no ip split-horizon eigrp 200
 ip pim nbma-mode
 ip pim sparse-mode
 ip nhrp authentication cisco123
 ip nhrp map multicast dynamic
```

```
 ip nhrp network-id 101
 ip nhrp holdtime 600
 ip nhrp redirect
 ip tcp adjust-mss 1360
 tunnel source GigabitEthernet0/0/3
 tunnel mode gre multipoint
 tunnel vrf INET-PUBLIC
 tunnel protection ipsec profile DMVPN-PROFILE
!
interface GigabitEthernet0/0/0
 description WAN-D3750X Gig1/0/3
 no ip address
 negotiation auto
 cdp enable
 channel-group 3 mode active
!
interface GigabitEthernet0/0/1
 description WAN-D3750X Gig2/0/3
 no ip address
 negotiation auto
 cdp enable
 channel-group 3 mode active
!
interface GigabitEthernet0/0/2
 no ip address
 negotiation auto
!
interface GigabitEthernet0/0/3
 bandwidth 100000
 ip vrf forwarding INET-PUBLIC
 ip address 192.168.18.10 255.255.255.0
 negotiation auto
 service-policy output WAN-INTERFACE-G0/0/3
!
interface GigabitEthernet0
 vrf forwarding Mgmt-intf
 no ip address
 shutdown
 negotiation auto
!
!
router eigrp 100
 network 10.4.0.0 0.1.255.255
 redistribute eigrp 200 route-map SET-ROUTE-TAG-DMVPN
 passive-interface default
 no passive-interface Port-channel3
 eigrp router-id 10.4.32.243
!
!
router eigrp 200
 network 10.4.34.0 0.0.1.255
 redistribute eigrp 100
 passive-interface default
 no passive-interface Tunnel10
 eigrp router-id 10.4.32.243
!
ip forward-protocol nd
!
no ip http server
ip http authentication aaa
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
ip pim autorp listener
ip pim register-source Loopback0
ip route vrf INET-PUBLIC 0.0.0.0 0.0.0.0 192.168.18.1
ip tacacs source-interface Loopback0
!
ip access-list extended ISAKMP
 permit udp any eq isakmp any eq isakmp
!
logging 10.4.48.35
!
route-map SET-ROUTE-TAG-DMVPN permit 10
 match interface Tunnel10
```

```
 set tag 65512
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
!
tacacs server TACACS-SERVER-1
 address ipv4 10.4.48.15
 key 7 107D0C1A17120620091D
!
!
control-plane
!
!
!
!
line con 0
 logging synchronous
 stopbits 1
line aux 0
 stopbits 1
line vty 0 4
 transport preferred none
 transport input ssh
line vty 5 15
 transport preferred none
 transport input ssh
!
ntp source Loopback0
ntp server 10.4.48.17
!
end
```

VPN-ASR1001-2

```
version 15.2
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
no platform punt-keepalive disable-kernel-core
!
hostname VPN-ASR1001-2
!
!
vrf definition Mgmt-intf
 !
 address-family ipv4
 exit-address-family
 !
 address-family ipv6
 exit-address-family
!
enable secret 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrsw
!
aaa new-model
!
!
aaa group server tacacs+ TACACS-SERVERS
 server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
!
!
!
!
aaa session-id common
clock timezone PST -8 0
clock summer-time PDT recurring
!
!
ip vrf INET-PUBLIC
 rd 65512:2
!
!
```

```
!
no ip domain lookup
ip domain name cisco.local
ip multicast-routing distributed
!
!
!
!
multilink bundle-name authenticated
!
!
!
!
!
!
!
license boot level adventerprise
!
!
!
!
!
!
username admin password 7 03070A180500701E1D
!
redundancy
 mode none
!
!
!
!
!
ip ssh source-interface Loopback0
ip ssh version 2
!
class-map match-any DATA
 match dscp af21
 match ip dscp af21
class-map match-any INTERACTIVE-VIDEO
 match dscp cs4  af41
class-map match-any CRITICAL-DATA
 match dscp cs3  af31
class-map match-any VOICE
 match dscp ef
class-map match-any SCAVENGER
 match dscp cs1  af11
 match ip dscp cs1  af11
class-map match-any NETWORK-CRITICAL
 match dscp cs2  cs6
 match ip dscp cs2  cs6
 match access-group name ISAKMP
!
policy-map WAN
 class VOICE
  priority percent 10
 class INTERACTIVE-VIDEO
  priority percent 23
 class CRITICAL-DATA
  bandwidth percent 15
  random-detect dscp-based
 class DATA
  bandwidth percent 19
  random-detect dscp-based
 class SCAVENGER
  bandwidth percent 5
 class NETWORK-CRITICAL
  bandwidth percent 3
 class class-default
  bandwidth percent 25
  random-detect
policy-map WAN-INTERFACE-G0/0/3
 class class-default
  shape average 50000000
   service-policy WAN
!
crypto keyring DMVPN-KEYRING vrf INET-PUBLIC
```

```
  pre-shared-key address 0.0.0.0 0.0.0.0 key cisco123
!
crypto isakmp policy 10
 encr aes 256
 authentication pre-share
 group 2
crypto isakmp profile FVRF-ISAKMP-INET-PUBLIC
   keyring DMVPN-KEYRING
   match identity address 0.0.0.0 INET-PUBLIC
!
!
crypto ipsec transform-set AES256/SHA/TRANSPORT esp-aes 256 esp-
sha-hmac
 mode transport
!
crypto ipsec profile DMVPN-PROFILE
 set transform-set AES256/SHA/TRANSPORT
 set isakmp-profile FVRF-ISAKMP-INET-PUBLIC
!
!
!
!
!
!
!
interface Loopback0
 ip address 10.4.32.244 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel4
 ip address 10.4.32.22 255.255.255.252
 ip pim sparse-mode
 no negotiation auto
!
interface Tunnel10
 bandwidth 50000
 ip address 10.4.36.1 255.255.254.0
 no ip redirects
 ip mtu 1400
 ip hello-interval eigrp 201 20
 ip hold-time eigrp 201 60
 no ip split-horizon eigrp 201
 ip pim nbma-mode
 ip pim sparse-mode
 ip nhrp authentication cisco123
 ip nhrp map multicast dynamic
 ip nhrp network-id 102
 ip nhrp holdtime 600
 ip nhrp redirect
 ip tcp adjust-mss 1360
 tunnel source GigabitEthernet0/0/3
 tunnel mode gre multipoint
 tunnel vrf INET-PUBLIC
 tunnel protection ipsec profile DMVPN-PROFILE
!
interface GigabitEthernet0/0/0
 description WAN-D3750X Gig1/0/4
 no ip address
 negotiation auto
 cdp enable
 channel-group 4 mode active
!
interface GigabitEthernet0/0/1
 description WAN-D3750X Gig2/0/4
 no ip address
 negotiation auto
 cdp enable
 channel-group 4 mode active
!
interface GigabitEthernet0/0/2
 no ip address
 negotiation auto
!
interface GigabitEthernet0/0/3
 bandwidth 50000
 ip vrf forwarding INET-PUBLIC
```

```
 ip address 192.168.18.11 255.255.255.0
 negotiation auto
!
interface GigabitEthernet0
 vrf forwarding Mgmt-intf
 no ip address
 shutdown
 negotiation auto
!
!
router eigrp 100
 network 10.4.0.0 0.1.255.255
 redistribute eigrp 201 route-map SET-ROUTE-TAG-DMVPN
 passive-interface default
 no passive-interface Port-channel4
 eigrp router-id 10.4.32.244
!
!
router eigrp 201
 network 10.4.36.0 0.0.1.255
 redistribute eigrp 100
 passive-interface default
 no passive-interface Tunnel10
 eigrp router-id 10.4.32.244
!
ip forward-protocol nd
!
no ip http server
ip http authentication aaa
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
ip pim autorp listener
ip pim register-source Loopback0
ip route vrf INET-PUBLIC 0.0.0.0 0.0.0.0 192.168.18.1
ip tacacs source-interface Loopback0
!
ip access-list extended ISAKMP
 permit udp any eq isakmp any eq isakmp
!
logging 10.4.48.35
!
route-map SET-ROUTE-TAG-DMVPN permit 10
 match interface Tunnel10
 set tag 65512
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
!
tacacs server TACACS-SERVER-1
 address ipv4 10.4.48.15
 key 7 03375E08140A35674B10
!
!
control-plane
!
!
!
!
line con 0
 logging synchronous
 stopbits 1
line aux 0
 stopbits 1
line vty 0 4
 transport preferred none
 transport input ssh
line vty 5 15
 transport preferred none
 transport input ssh
!
ntp source Loopback0
ntp server 10.4.48.17
!
end
```

WAN Remote-Site Devices - Dual DMVPN and DMVPN Only Design Models

This section includes configuration files corresponding to the WAN remote-site design topologies as referenced in Figure 6. Each remote-site type has its respective devices grouped together along with any other relevant configuration information.

Figure 6 - WAN remote-site designs - Dual DMVPN and DMVPN only

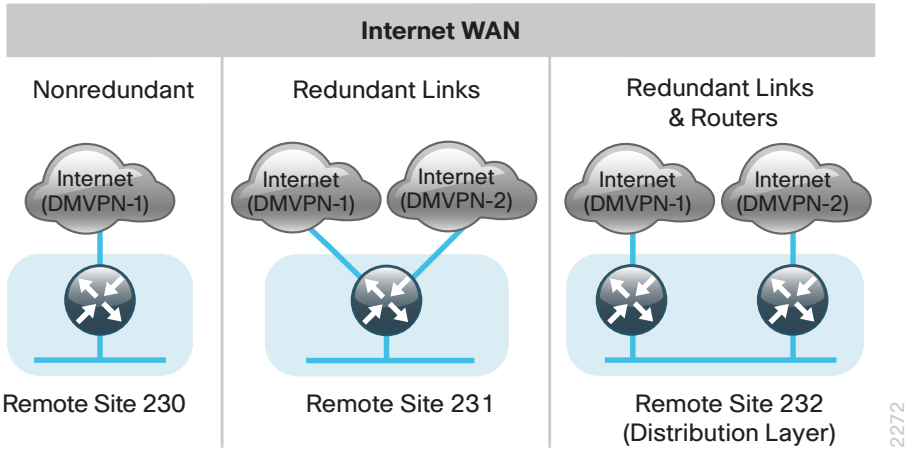


Table 5 - Remote-site DMVPN WAN connection details

Location	Net block	DMVPN	LAN interfaces
Remote Site 230 (Single-router, single-link)	10.5.192.0/21	(gig0/0) DHCP	(gig0/1)
Remote Site 231 (Single-router, dual-link)	10.5.200.0/21	(gig0/0) DHCP (gig0/1) DHCP	(gig0/2)
Remote Site 232 (Dual-router, dual-link with distribu-tion layer)	10.5.208.0/21	(gig0/0) DHCP (gig0/0) DHCP	(gig0/2) (gig0/2)

The following table lists the policed-rate link speeds for the remote-site quality-of-service (QoS) traffic shaping policies.

Table 6 - Remote-site policed-rate link speeds

Location	Net block	DMVPN-1 link speeds	DMVPN-2 link speeds
Remote Site 230	10.5.192.0/21	2 Mbps	--
Remote Site 230 (dual-link)	10.5.200.0/21	10 Mbps	5 Mbps
Remote Site 232 (dual-link)	10.5.208.0/21	10 Mbps	5 Mbps

Remote Site 230: Single-Router, Single-Link (DMVPN)

Table 7 - Remote Site 230—IP address information

Location	Net block	Data wired subnet	Voice wired subnet	Loopbacks and switches
Remote Site 230	10.5.192.0/21	10.5.196.0/24 (VLAN 64)	10.5.197.0/24 (VLAN 69)	10.255.253.205 (router) 10.5.196.5 (access switch)

RS230-1941

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS230-1941
!
boot-start-marker
boot-end-marker
!
!
enable secret 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrsw
!
aaa new-model
!
!
aaa group server tacacs+ TACACS-SERVERS
 server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
!
!
!
!
aaa session-id common
!
clock timezone PST -8 0
clock summer-time PDT recurring
!
no ipv6 cef
ipv6 spd queue min-threshold 62
ipv6 spd queue max-threshold 63
ip source-route
ip cef
!
!
!
ip vrf INET-PUBLIC1
 rd 65512:1
!
ip multicast-routing
!
!
ip domain name cisco.local
!
multilink bundle-name authenticated
!
license udi pid CISCO1941/K9 sn FTX140980GX
license boot module c1900 technology-package datak9
!
!
username admin password 7 011057175804575D72
!
redundancy
!
!
!
!
```

```
ip ssh source-interface Loopback0
ip ssh version 2
!
class-map match-any DATA
 match  dscp af21
class-map match-any INTERACTIVE-VIDEO
 match  dscp cs4  af41
class-map match-any CRITICAL-DATA
 match  dscp cs3  af31
class-map match-any VOICE
 match  dscp ef
class-map match-any SCAVENGER
 match  dscp cs1  af11
class-map match-any NETWORK-CRITICAL
 match  dscp cs2  cs6
 match access-group name ISAKMP
!
!
policy-map WAN
 class VOICE
  priority percent 10
 class INTERACTIVE-VIDEO
  priority percent 23
 class CRITICAL-DATA
  bandwidth percent 15
  random-detect dscp-based
 class DATA
  bandwidth percent 19
  random-detect dscp-based
 class SCAVENGER
  bandwidth percent 5
 class NETWORK-CRITICAL
  bandwidth percent 3
 class class-default
  bandwidth percent 25
  random-detect
policy-map WAN-INTERFACE-G0/0
 class class-default
  shape average 2000000
  service-policy WAN
!
!
crypto keyring DMVPN-KEYRING1 vrf INET-PUBLIC1
  pre-shared-key address 0.0.0.0 0.0.0.0 key cisco123
!
crypto isakmp policy 10
 encr aes 256
 authentication pre-share
 group 2
crypto isakmp keepalive 30 5
crypto isakmp profile FVRF-ISAKMP-INET-PUBLIC1
   keyring DMVPN-KEYRING1
   match identity address 0.0.0.0 INET-PUBLIC1
!
!
crypto ipsec transform-set AES256/SHA/TRANSPORT esp-aes 256 esp-
sha-hmac
 mode transport
!
crypto ipsec profile DMVPN-PROFILE1
 set transform-set AES256/SHA/TRANSPORT
 set isakmp-profile FVRF-ISAKMP-INET-PUBLIC1
!
!
!
!
!
!
interface Loopback0
 ip address 10.255.253.230 255.255.255.255
 ip pim sparse-mode
!
interface Tunnel10
 bandwidth 2000
```

```
 ip address 10.4.34.230 255.255.254.0
 no ip redirects
 ip mtu 1400
 ip pim dr-priority 0
 ip pim nbma-mode
 ip pim sparse-mode
 ip hello-interval eigrp 200 20
 ip hold-time eigrp 200 60
 ip nhrp authentication cisco123
 ip nhrp map multicast 172.16.130.1
 ip nhrp map 10.4.34.1 172.16.130.1
 ip nhrp network-id 101
 ip nhrp holdtime 600
 ip nhrp nhs 10.4.34.1
 ip nhrp registration no-unique
 ip nhrp shortcut
 ip nhrp redirect
 ip virtual-reassembly in
 ip virtual-reassembly out
 ip tcp adjust-mss 1360
 ip summary-address eigrp 200 10.5.192.0 255.255.248.0
 tunnel source GigabitEthernet0/0
 tunnel mode gre multipoint
 tunnel vrf INET-PUBLIC1
 tunnel protection ipsec profile DMVPN-PROFILE1
!
interface Port-channel1
 no ip address
 hold-queue 300 in
!
interface GigabitEthernet0/0
 bandwidth 2000
 ip vrf forwarding INET-PUBLIC1
 ip address dhcp
 ip access-group ACL-INET-PUBLIC in
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/1
 description RS230-A3560X Gig0/48
 no ip address
 duplex auto
 speed auto
!
interface GigabitEthernet0/1.64
 description Wired Data
 encapsulation dot1Q 64
 ip address 10.5.196.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface GigabitEthernet0/1.69
 description Wired Voice
 encapsulation dot1Q 69
 ip address 10.5.197.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
!
router eigrp 200
 network 10.4.34.0 0.0.1.255
 network 10.5.0.0 0.0.255.255
 network 10.255.0.0 0.0.255.255
 passive-interface default
 no passive-interface Tunnel10
 eigrp router-id 10.255.253.230
 eigrp stub connected summary
!
ip forward-protocol nd
!
ip pim autorp listener
ip pim register-source Loopback0
```

```
no ip http server
ip http authentication aaa
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!
ip tacacs source-interface Loopback0
!
ip access-list extended ACL-INET-PUBLIC
 permit udp any any eq non500-isakmp
 permit udp any any eq isakmp
 permit esp any any
 permit udp any any eq bootpc
 permit icmp any any echo
 permit icmp any any echo-reply
 permit icmp any any ttl-exceeded
 permit icmp any any port-unreachable
 permit udp any any gt 1023 ttl eq 1
ip access-list extended ISAKMP
 permit udp any eq isakmp any eq isakmp
!
logging 10.4.48.35
!
!
!
!
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
tacacs server TACACS-SERVER-1
 address ipv4 10.4.48.15
 key 7 00371605165E1F2D0A38
!
!
!
control-plane
!
!
line con 0
 logging synchronous
line aux 0
line vty 0 4
 transport preferred none
 transport input ssh
line vty 5 15
 transport preferred none
 transport input ssh
!
scheduler allocate 20000 1000
ntp source Loopback0
ntp server 10.4.48.17
!
end
```

Remote Site 231: Single-Router, Dual-Link (DMVPN + DMVPN)

Table 8 - Remote Site 231—IP address information

Location	Net block	Data wired subnet	Voice wired subnet	Loopbacks and switches
Remote Site 231	10.5.200.0/21	10.5.204.0/24 (VLAN 64)	10.5.205.0/24 (VLAN 69)	10.255.253.231 (router) 10.5.204.5 (access switch)

RS231-2911

```
version 15.1
service config
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS231-2911
```

```
!
boot-start-marker
boot-end-marker
!
!
enable secret 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrsw
!
aaa new-model
!
!
aaa group server tacacs+ TACACS-SERVERS
 server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
!
!
!
!
aaa session-id common
!
clock timezone PST -8 0
clock summer-time PDT recurring
!
no ipv6 cef
ip source-route
ip cef
!
!
!
ip vrf INET-PUBLIC1
 rd 65512:1
!
ip vrf INET-PUBLIC2
 rd 65512:2
!
ip multicast-routing
ip dhcp remember
!
!
ip domain name cisco.local
!
multilink bundle-name authenticated
!
!
!
!
!
voice-card 0
!
!
!
!
!
!
!
license udi pid CISCO2911/K9 sn FTX1411ALG3
hw-module sm 1
!
!
!
username admin password 7 0007421507545A545C
!
redundancy
!
!
!
!
ip ssh source-interface Loopback0
ip ssh version 2
!
class-map match-any DATA
```

```
 match  dscp af21
class-map match-any INTERACTIVE-VIDEO
 match  dscp cs4  af41
class-map match-any CRITICAL-DATA
 match  dscp cs3  af31
class-map match-any VOICE
 match  dscp ef
class-map match-any SCAVENGER
 match  dscp cs1  af11
class-map match-any NETWORK-CRITICAL
 match  dscp cs2  cs6
 match access-group name ISAKMP
!
!
policy-map WAN
 class VOICE
  priority percent 10
 class INTERACTIVE-VIDEO
  priority percent 23
 class CRITICAL-DATA
  bandwidth percent 15
  random-detect dscp-based
 class DATA
  bandwidth percent 19
  random-detect dscp-based
 class SCAVENGER
  bandwidth percent 5
 class NETWORK-CRITICAL
  bandwidth percent 3
 class class-default
  bandwidth percent 25
  random-detect
policy-map WAN-INTERFACE-G0/1
 class class-default
  shape average 5000000
  service-policy WAN
policy-map WAN-INTERFACE-G0/0
 class class-default
  shape average 10000000
  service-policy WAN
!
!
crypto keyring DMVPN-KEYRING1 vrf INET-PUBLIC1
  pre-shared-key address 0.0.0.0 0.0.0.0 key cisco123
crypto keyring DMVPN-KEYRING2 vrf INET-PUBLIC2
  pre-shared-key address 0.0.0.0 0.0.0.0 key cisco123
!
crypto isakmp policy 10
 encr aes 256
 authentication pre-share
 group 2
crypto isakmp keepalive 30 5
crypto isakmp profile FVRF-ISAKMP-INET-PUBLIC1
   keyring DMVPN-KEYRING1
   match identity address 0.0.0.0 INET-PUBLIC1
crypto isakmp profile FVRF-ISAKMP-INET-PUBLIC2
   keyring DMVPN-KEYRING2
   match identity address 0.0.0.0 INET-PUBLIC2
!
!
crypto ipsec transform-set AES256/SHA/TRANSPORT esp-aes 256 esp-
sha-hmac
 mode transport
!
crypto ipsec profile DMVPN-PROFILE1
 set transform-set AES256/SHA/TRANSPORT
 set isakmp-profile FVRF-ISAKMP-INET-PUBLIC1
!
crypto ipsec profile DMVPN-PROFILE2
 set transform-set AES256/SHA/TRANSPORT
 set isakmp-profile FVRF-ISAKMP-INET-PUBLIC2
!
!
!
```

```
!
!
!
!
interface Loopback0
 ip address 10.255.253.231 255.255.255.255
 ip pim sparse-mode
!
interface Tunnel10
 bandwidth 10000
 ip address 10.4.34.231 255.255.254.0
 no ip redirects
 ip mtu 1400
 ip pim dr-priority 0
 ip pim nbma-mode
 ip pim sparse-mode
 ip hello-interval eigrp 200 20
 ip hold-time eigrp 200 60
 ip nhrp authentication cisco123
 ip nhrp map multicast 172.16.130.1
 ip nhrp map 10.4.34.1 172.16.130.1
 ip nhrp network-id 101
 ip nhrp holdtime 600
 ip nhrp nhs 10.4.34.1
 ip nhrp registration no-unique
 ip nhrp shortcut
 ip nhrp redirect
 ip tcp adjust-mss 1360
 ip summary-address eigrp 200 10.5.200.0 255.255.248.0
 tunnel source GigabitEthernet0/0
 tunnel mode gre multipoint
 tunnel vrf INET-PUBLIC1
 tunnel protection ipsec profile DMVPN-PROFILE1
!
interface Tunnel11
 bandwidth 5000
 ip address 10.4.36.231 255.255.254.0
 no ip redirects
 ip mtu 1400
 ip pim dr-priority 0
 ip pim nbma-mode
 ip pim sparse-mode
 ip hello-interval eigrp 201 20
 ip hold-time eigrp 201 60
 ip nhrp authentication cisco123
 ip nhrp map multicast 172.17.130.1
 ip nhrp map 10.4.36.1 172.17.130.1
 ip nhrp network-id 102
 ip nhrp holdtime 600
 ip nhrp nhs 10.4.36.1
 ip nhrp registration no-unique
 ip nhrp shortcut
 ip nhrp redirect
 ip tcp adjust-mss 1360
 ip summary-address eigrp 201 10.5.200.0 255.255.248.0
 tunnel source GigabitEthernet0/1
 tunnel mode gre multipoint
 tunnel vrf INET-PUBLIC2
 tunnel protection ipsec profile DMVPN-PROFILE2
!
interface GigabitEthernet0/0
 bandwidth 10000
 ip vrf forwarding INET-PUBLIC1
 ip address dhcp
 ip access-group ACL-INET-PUBLIC in
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/1
 bandwidth 5000
 ip vrf forwarding INET-PUBLIC2
 ip address dhcp
```

```
 ip access-group ACL-INET-PUBLIC in
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/1
!
interface GigabitEthernet0/2
 description RS231-A2960S Gig1/0/24
 duplex auto
 speed auto
!
interface GigabitEthernet0/2.64
 description Wired Data
 encapsulation dot1Q 64
 ip address 10.5.204.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface GigabitEthernet0/2.69
 description Wired Voice
 encapsulation dot1Q 69
 ip address 10.5.205.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan1
 no ip address
!
!
router eigrp 200
 network 10.4.34.0 0.0.1.255
 network 10.5.0.0 0.0.255.255
 network 10.255.0.0 0.0.255.255
 passive-interface default
 no passive-interface Tunnel10
 eigrp router-id 10.255.253.231
 eigrp stub connected summary
!
!
router eigrp 201
 network 10.4.36.0 0.0.1.255
 network 10.5.0.0 0.0.255.255
 network 10.255.0.0 0.0.255.255
 passive-interface default
 no passive-interface Tunnel11
 eigrp router-id 10.255.253.231
 eigrp stub connected summary
!
ip forward-protocol nd
!
ip pim autorp listener
ip pim register-source Loopback0
no ip http server
ip http authentication aaa
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!
ip tacacs source-interface Loopback0
!
ip access-list extended ACL-INET-PUBLIC
 permit udp any any eq non500-isakmp
 permit udp any any eq isakmp
 permit esp any any
 permit udp any any eq bootpc
 permit icmp any any echo
 permit icmp any any echo-reply
 permit icmp any any ttl-exceeded
 permit icmp any any port-unreachable
 permit udp any any gt 1023 ttl eq 1
class-map match-any NETWORK-CRITICAL
 match access-group name ISAKMP
!
logging 10.4.48.35
!
```

```
!
!
!
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
tacacs server TACACS-SERVER-1
 address ipv4 10.4.48.15
 key 7 0812494D1B1C113C1712
!
!
!
control-plane
!
!
!
mgcp profile default
!
!
!
!
!
gatekeeper
 shutdown
!
!
!
line con 0
 logging synchronous
line aux 0
line vty 0 4
 exec-timeout 0 0
 transport preferred none
 transport input ssh
line vty 5 15
 exec-timeout 0 0
 transport preferred none
 transport input ssh
!
scheduler allocate 20000 1000
ntp source Loopback0
ntp server 10.4.48.17
!
end
```

Remote Site 232: Dual-Router, Dual-Link with Distribution Layer (DMVPN + DMVPN)

Table 9 - Remote Site 232—IP address information

Location	Net block	Data wired subnet	Voice wired subnet	Loopbacks and switches
Remote Site 232	10.5.208.0/21	10.5.209.0/24 (VLAN 100) 10.5.211.0/24 (VLAN 102)	10.5.210.0/24 (VLAN 101) 10.5.212.0/24 (VLAN 103)	10.255.253.232 (router 1) 10.255.254.232 (router 2) 10.5.215.254 (distribution switch) 10.5.215.2 (access switch 1 10.5.215.3 (access switch 2)

The following two tables provide additional information to connect to the distribution layer.

Table 10 - Remote Site 232—router connections to distribution layer

Remote-site information		Connection to distribution layer switch			Port-Channel subinterface and IP assignments		
Location	Net block	Router	Port channel	Member interfaces	Subinterface	VLAN	Network
Remote Site 232	10.5.208.0/21	RS232-2911-1	1	gig0/1 gig0/2	Port-channel1.50	50	10.5.208.0/30
					Port-channel1.99 (transit network)	99	10.5.208.8/30
		RS232-2911-2	2	gig0/1 gig0/2	Port-channel2.54	54	10.5.208.4/30
					Port-channel2.99 (transit network)	99	10.5.208.8/30

Table 11 - Remote Site 232—distribution layer switch connections

Port channel	Member interfaces	Layer3/Layer2	Connected device
1	gig1/0/11 gig2/0/11	Layer 2 (VLAN 50, 99)	RS232-2911-1
2	gig1/0/12 gig2/0/12	Layer 2 (VLAN 54, 99)	RS232-2911-2
10	gig1/0/1 gig2/0/1	Layer 2 (VLAN 100,101,106)	RS232-A3560X
11	gig1/0/2 gig2/0/2	Layer 2 (VLAN 102,103,106)	RS232-A3560X-PR2

RS232-2911-1

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS232-2911-1
!
boot-start-marker
boot-end-marker
!
!
enable secret 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrsw
!
aaa new-model
!
!
aaa group server tacacs+ TACACS-SERVERS
 server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
!
!
!
!
aaa session-id common
!
clock timezone PST -8 0
clock summer-time PDT recurring
!
no ipv6 cef
!
ip source-route
ip cef
!
!
!
ip vrf INET-PUBLIC1
 rd 65512:1
!
ip multicast-routing
!
!
ip domain name cisco.local
!
multilink bundle-name authenticated
!
!
!
!
!
voice-card 0
!
!
!
!
!
!
!
license udi pid CISCO2911/K9 sn FTX1420AJLB
license boot module c2900 technology-package securityk9
hw-module pvdm 0/0
!
!
!
username admin password 7 011057175804575D72
!
redundancy
!
!
!
```

```
!
ip ssh source-interface Loopback0
ip ssh version 2
!
class-map match-any DATA
 match  dscp af21
class-map match-any INTERACTIVE-VIDEO
 match  dscp cs4  af41
class-map match-any CRITICAL-DATA
 match  dscp cs3  af31
class-map match-any VOICE
 match  dscp ef
class-map match-any SCAVENGER
 match  dscp cs1  af11
class-map match-any NETWORK-CRITICAL
 match  dscp cs2  cs6
 match access-group name ISAKMP
!
!
policy-map WAN
 class VOICE
  priority percent 10
 class INTERACTIVE-VIDEO
  priority percent 23
 class CRITICAL-DATA
  bandwidth percent 15
  random-detect dscp-based
 class DATA
  bandwidth percent 19
  random-detect dscp-based
 class SCAVENGER
  bandwidth percent 5
 class NETWORK-CRITICAL
  bandwidth percent 3
 class class-default
  bandwidth percent 25
  random-detect
```

```
policy-map WAN-INTERFACE-G0/0
 class class-default
  shape average 10000000
  service-policy WAN
!
!
crypto keyring DMVPN-KEYRING1 vrf INET-PUBLIC1
  pre-shared-key address 0.0.0.0 0.0.0.0 key cisco123
!
crypto isakmp policy 10
 encr aes 256
 authentication pre-share
 group 2
!
crypto isakmp keepalive 30 5
crypto isakmp profile FVRF-ISAKMP-INET-PUBLIC1
   keyring DMVPN-KEYRING1
   match identity address 0.0.0.0 INET-PUBLIC1
!
!
crypto ipsec transform-set AES256/SHA/TRANSPORT esp-aes 256 esp-
sha-hmac
 mode transport
!
crypto ipsec profile DMVPN-PROFILE1
 set transform-set AES256/SHA/TRANSPORT
 set isakmp-profile FVRF-ISAKMP-INET-PUBLIC1
!
!
!
!
!
interface Loopback0
 ip address 10.255.253.232 255.255.255.255
 ip pim sparse-mode
!
interface Tunnel10
```

```
 bandwidth 10000
 ip address 10.4.34.232 255.255.254.0
 no ip redirects
 ip mtu 1400
 ip pim dr-priority 0
 ip pim nbma-mode
 ip pim sparse-mode
 ip hello-interval eigrp 200 20
 ip hold-time eigrp 200 60
 ip nhrp authentication cisco123
 ip nhrp map multicast 172.16.130.1
 ip nhrp map 10.4.34.1 172.16.130.1
 ip nhrp network-id 101
 ip nhrp holdtime 600
 ip nhrp nhs 10.4.34.1
 ip nhrp registration no-unique
 ip nhrp shortcut
 ip nhrp redirect
 ip tcp adjust-mss 1360
 ip summary-address eigrp 200 10.5.208.0 255.255.248.0
 tunnel source GigabitEthernet0/0
 tunnel mode gre multipoint
 tunnel vrf INET-PUBLIC1
 tunnel protection ipsec profile DMVPN-PROFILE1
!
interface Port-channel1
 description EtherChannel link to RS232-D3750X
 no ip address
 hold-queue 150 in
!
interface Port-channel1.50
 description R1 routed link to distribution layer
 encapsulation dot1Q 50
 ip address 10.5.208.1 255.255.255.252
 ip pim sparse-mode
!
interface Port-channel1.99
 description Transit Net
 encapsulation dot1Q 99
 ip address 10.5.208.9 255.255.255.252
 ip pim sparse-mode
!
interface GigabitEthernet0/0
 description DMVPN WAN Uplink
 ip vrf forwarding INET-PUBLIC1
 ip address dhcp
 ip access-group ACL-INET-PUBLIC in
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/1
 description RS232-D3750X Gig1/0/11
 no ip address
 duplex auto
 speed auto
 channel-group 1
!
interface GigabitEthernet0/2
 description RS232-D3750X Gig2/0/11
 no ip address
 duplex auto
 speed auto
 channel-group 1
!
!
router eigrp 200
 network 10.4.34.0 0.0.1.255
 network 10.5.0.0 0.0.255.255
 network 10.255.0.0 0.0.255.255
 redistribute eigrp 100 route-map LOOPBACK-ONLY
 passive-interface default
 no passive-interface Tunnel10
```

```
 eigrp router-id 10.255.253.232
 eigrp stub connected summary redistributed
!
!
router eigrp 100
 network 10.5.0.0 0.0.255.255
 network 10.255.0.0 0.0.255.255
 redistribute eigrp 200
 passive-interface default
 no passive-interface Port-channel1.50
 no passive-interface Port-channel1.99
 eigrp router-id 10.255.253.232
!
ip forward-protocol nd
!
ip pim autorp listener
ip pim register-source Loopback0
no ip http server
ip http authentication aaa
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!
ip tacacs source-interface Loopback0
!
ip access-list standard R2-LOOPBACK
 permit 10.255.254.232
!
ip access-list extended ACL-INET-PUBLIC
 permit udp any any eq non500-isakmp
 permit udp any any eq isakmp
 permit esp any any
 permit udp any any eq bootpc
 permit icmp any any echo
 permit icmp any any echo-reply
 permit icmp any any ttl-exceeded
 permit icmp any any port-unreachable
 permit udp any any gt 1023 ttl eq 1
ip access-list extended ISAKMP
 permit udp any eq isakmp any eq isakmp
!
logging 10.4.48.35
!
!
!
!
route-map LOOPBACK-ONLY permit 10
 match ip address R2-LOOPBACK
!
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
tacacs server TACACS-SERVER-1
 address ipv4 10.4.48.15
 key 7 13361211190910012E3D
!
!
!
control-plane
!
!
!
mgcp profile default
!
!
!
!
!
gatekeeper
 shutdown
!
!
!
line con 0
```

```
 logging synchronous
line aux 0
line vty 0 4
 transport preferred none
 transport input ssh
line vty 5 15
 transport preferred none
 transport input ssh
!
scheduler allocate 20000 1000
ntp source Loopback0
ntp server 10.4.48.17
!
end
```

RS232-2911-2

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS232-2911-2
!
boot-start-marker
boot-end-marker
!
!
enable secret 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrsw
!
aaa new-model
!
!
aaa group server tacacs+ TACACS-SERVERS
 server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
!
!
!
!
aaa session-id common
!
clock timezone PST -8 0
clock summer-time PDT recurring
!
no ipv6 cef
!

ip source-route
ip cef
!
!
!
ip vrf INET-PUBLIC2
 rd 65512:2
!
ip multicast-routing
!
!
ip domain name cisco.local
!
multilink bundle-name authenticated
!
!
!
!
!
voice-card 0
!
!
```

```
!
!
!
!
!
license udi pid CISCO2911/K9 sn FTX1420AJL8
license boot module c2900 technology-package securityk9
hw-module pvdm 0/0
!
!
!
username admin password 7 04585A150C2E1D1C5A
!
redundancy
!
!
!
!
ip ssh source-interface Loopback0
ip ssh version 2
!
class-map match-any DATA
 match  dscp af21
class-map match-any INTERACTIVE-VIDEO
 match  dscp cs4  af41
class-map match-any CRITICAL-DATA
 match  dscp cs3  af31
class-map match-any VOICE
 match  dscp ef
class-map match-any SCAVENGER
 match  dscp cs1  af11
class-map match-any NETWORK-CRITICAL
 match  dscp cs2  cs6
 match access-group name ISAKMP
!
!
policy-map WAN
 class VOICE
  priority percent 10
 class INTERACTIVE-VIDEO
  priority percent 23
 class CRITICAL-DATA
  bandwidth percent 15
  random-detect dscp-based
 class DATA
  bandwidth percent 19
  random-detect dscp-based
 class SCAVENGER
  bandwidth percent 5
 class NETWORK-CRITICAL
  bandwidth percent 3
  class class-default
  bandwidth percent 25
  random-detect
policy-map WAN-INTERFACE-G0/0
 class class-default
  shape average 5000000
  service-policy WAN
!
!
crypto keyring DMVPN-KEYRING2 vrf INET-PUBLIC2
  pre-shared-key address 0.0.0.0 0.0.0.0 key cisco123
!
crypto isakmp policy 10
 encr aes 256
 authentication pre-share
 group 2
crypto isakmp keepalive 30 5
crypto isakmp profile FVRF-ISAKMP-INET-PUBLIC2
   keyring DMVPN-KEYRING2
   match identity address 0.0.0.0 INET-PUBLIC2
!
!
crypto ipsec transform-set AES256/SHA/TRANSPORT esp-aes 256 esp-
```

```
sha-hmac
 mode transport
!
crypto ipsec profile DMVPN-PROFILE2
 set transform-set AES256/SHA/TRANSPORT
 set isakmp-profile FVRF-ISAKMP-INET-PUBLIC2
!
!
!
!
!
!
interface Loopback0
 ip address 10.255.254.232 255.255.255.255
 ip pim sparse-mode
!
interface Tunnel11
 bandwidth 5000
 ip address 10.4.36.232 255.255.254.0
 no ip redirects
 ip mtu 1400
 ip pim dr-priority 0
 ip pim nbma-mode
 ip pim sparse-mode
 ip hello-interval eigrp 201 20
 ip hold-time eigrp 201 60
 ip nhrp authentication cisco123
 ip nhrp map multicast 172.17.130.1
 ip nhrp map 10.4.36.1 172.17.130.1
 ip nhrp network-id 102
 ip nhrp holdtime 600
 ip nhrp nhs 10.4.36.1
 ip nhrp registration no-unique
 ip nhrp shortcut
 ip nhrp redirect
 ip tcp adjust-mss 1360
 ip summary-address eigrp 201 10.5.208.0 255.255.248.0
 tunnel source GigabitEthernet0/0
 tunnel mode gre multipoint
 tunnel vrf INET-PUBLIC2
 tunnel protection ipsec profile DMVPN-PROFILE2
!
interface Port-channel2
 description EtherChannel link to RS232-D3750X
 no ip address
 hold-queue 150 in
!
interface Port-channel2.54
 description R2 routed link to distribution layer
 encapsulation dot1Q 54
 ip address 10.5.208.5 255.255.255.252
 ip pim sparse-mode
!
interface Port-channel2.99
 description Transit net
 encapsulation dot1Q 99
 ip address 10.5.208.10 255.255.255.252
 ip pim sparse-mode
!
interface GigabitEthernet0/0
 description DMVPN WAN Uplink
 ip vrf forwarding INET-PUBLIC2
 ip address dhcp
 duplex auto
 speed auto
 service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/1
 description RS232-D3750X Gig1/0/12
 no ip address
 duplex auto
 speed auto
 channel-group 2
!
```

```
interface GigabitEthernet0/2
 description RS232-D3750X Gig2/0/12
 no ip address
 duplex auto
 speed auto
 channel-group 2
!
!
router eigrp 201
 network 10.4.36.0 0.0.1.255
 network 10.5.0.0 0.0.255.255
 network 10.255.0.0 0.0.255.255
 redistribute eigrp 100 route-map LOOPBACK-ONLY
 passive-interface default
 no passive-interface Tunnel11
 eigrp router-id 10.255.254.232
 eigrp stub connected summary redistributed
!
!
router eigrp 100
 network 10.5.0.0 0.0.255.255
 network 10.255.0.0 0.0.255.255
 redistribute eigrp 201
 passive-interface default
 no passive-interface Port-channel2.54
 no passive-interface Port-channel2.99
 eigrp router-id 10.255.254.232
!
ip forward-protocol nd
!
ip pim autorp listener
ip pim register-source Loopback0
no ip http server
ip http authentication aaa
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!
ip tacacs source-interface Loopback0
!
ip access-list standard R1-LOOPBACK
 permit 10.255.253.232
!
ip access-list extended ACL-INET-PUBLIC
 permit udp any any eq non500-isakmp
 permit udp any any eq isakmp
 permit esp any any
 permit udp any any eq bootpc
 permit icmp any any echo
 permit icmp any any echo-reply
 permit icmp any any ttl-exceeded
 permit icmp any any port-unreachable
 permit udp any any gt 1023 ttl eq 1
ip access-list extended ISAKMP
 permit udp any eq isakmp any eq isakmp
!
logging 10.4.48.35
!
!
!
!
route-map LOOPBACK-ONLY permit 10
 match ip address R1-LOOPBACK
!
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
tacacs server TACACS-SERVER-1
 address ipv4 10.4.48.15
 key 7 107D0C1A17120620091D
!
!
!
control-plane
```

```
!
!
!
mgcp profile default
!
!
!
!
!
gatekeeper
 shutdown
!
!
!
line con 0
 logging synchronous
line aux 0
line vty 0 4
 transport preferred none
 transport input ssh
line vty 5 15
 transport preferred none
 transport input ssh
!
scheduler allocate 20000 1000
ntp source Loopback0
ntp server 10.4.48.17
!
end
```

RS232-D3750X

```
version 15.0
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS232-D3750X
!
boot-start-marker
boot-end-marker
!
!
enable secret 5 $1$cKuX$kbkjDnW.LpKWsHlt9zitp1
!
username admin password 7 04585A150C2E1D1C5A
aaa new-model
!
!
aaa group server tacacs+ TACACS-SERVERS
 server name TACACS-SERVER-1
!
aaa authentication login default group tacacs+ local
aaa authorization console
aaa authorization exec default group tacacs+ local
!
!
!
!
!
aaa session-id common
clock timezone PST -8 0
clock summer-time PDT recurring
switch 1 provision ws-c3750x-12s
switch 2 provision ws-c3750x-12s
stack-mac persistent timer 0
system mtu routing 1500
ip routing
!
!
!
ip domain-name cisco.local
ip name-server 10.4.48.10
```

```
ip multicast-routing distributed
vtp mode transparent
udld enable

!
mls qos map policed-dscp  0 10 18 24 46 to 8
mls qos map cos-dscp 0 8 16 24 32 46 48 56
mls qos srr-queue input bandwidth 70 30
mls qos srr-queue input threshold 1 80 90
mls qos srr-queue input priority-queue 2 bandwidth 30
mls qos srr-queue input cos-map queue 1 threshold 2 3
mls qos srr-queue input cos-map queue 1 threshold 3 6 7
mls qos srr-queue input cos-map queue 2 threshold 1 4
mls qos srr-queue input dscp-map queue 1 threshold 2 24
mls qos srr-queue input dscp-map queue 1 threshold 3 48 49 50 51
52 53 54 55
mls qos srr-queue input dscp-map queue 1 threshold 3 56 57 58 59
60 61 62 63
mls qos srr-queue input dscp-map queue 2 threshold 3 32 33 40 41
42 43 44 45
mls qos srr-queue input dscp-map queue 2 threshold 3 46 47
mls qos srr-queue output cos-map queue 1 threshold 3 4 5
mls qos srr-queue output cos-map queue 2 threshold 1 2
mls qos srr-queue output cos-map queue 2 threshold 2 3
mls qos srr-queue output cos-map queue 2 threshold 3 6 7
mls qos srr-queue output cos-map queue 3 threshold 3 0
mls qos srr-queue output cos-map queue 4 threshold 3 1
mls qos srr-queue output dscp-map queue 1 threshold 3 32 33 40 41
42 43 44 45
mls qos srr-queue output dscp-map queue 1 threshold 3 46 47
mls qos srr-queue output dscp-map queue 2 threshold 1 16 17 18 19
20 21 22 23
mls qos srr-queue output dscp-map queue 2 threshold 1 26 27 28 29
30 31 34 35
mls qos srr-queue output dscp-map queue 2 threshold 1 36 37 38 39
mls qos srr-queue output dscp-map queue 2 threshold 2 24
mls qos srr-queue output dscp-map queue 2 threshold 3 48 49 50 51
52 53 54 55
mls qos srr-queue output dscp-map queue 2 threshold 3 56 57 58 59
60 61 62 63
mls qos srr-queue output dscp-map queue 3 threshold 3 0 1 2 3 4 5
6 7
mls qos srr-queue output dscp-map queue 4 threshold 1 8 9 11 13
15
mls qos srr-queue output dscp-map queue 4 threshold 2 10 12 14
mls qos queue-set output 1 threshold 1 100 100 50 200
mls qos queue-set output 1 threshold 2 125 125 100 400
mls qos queue-set output 1 threshold 3 100 100 100 3200
mls qos queue-set output 1 threshold 4 60 150 50 200
mls qos queue-set output 1 buffers 15 25 40 20
mls qos
!
!
!
!
!
spanning-tree mode rapid-pvst
spanning-tree portfast bpduguard default
spanning-tree extend system-id
spanning-tree vlan 1-4094 priority 24576
!
!
!
port-channel load-balance src-dst-ip
!
vlan internal allocation policy ascending
!
vlan 50
 name R1-link
!
vlan 54
 name R2-link
!
vlan 99
```

```
 name Transit-net
!
vlan 100
 name DataVLAN1
!
vlan 101
 name VoiceVLAN1
!
vlan 102
 name DataVLAN2
!
vlan 103
 name VoiceVLAN2
!
vlan 106
 name Management
!
vlan 999
 name NativeVLAN
!
ip ssh source-interface Loopback0
ip ssh version 2
!
!
!
!
macro name EgressQoS
 mls qos trust dscp
 queue-set 2
 srr-queue bandwidth share 1 30 35 5
 priority-queue out
@
!
!
interface Loopback0
 ip address 10.5.215.254 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel1
 description EtherChannel link to RS232-2911-1
 switchport trunk encapsulation dot1q
 switchport trunk allowed vlan 50,99
 switchport mode trunk
 ip arp inspection trust
 spanning-tree portfast trunk
 ip dhcp snooping trust
!
interface Port-channel2
 description EtherChannel link to RS232-2911-2
 switchport trunk encapsulation dot1q
 switchport trunk allowed vlan 54,99
 switchport mode trunk
 ip arp inspection trust
 spanning-tree portfast trunk
 ip dhcp snooping trust
!
interface Port-channel10
 description EtherChannel link to RS232-A3560X
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 999
 switchport trunk allowed vlan 100,101,106
 switchport mode trunk
 logging event link-status
!
interface Port-channel11
 description EtherChannel link to RS232-A3560X-PR2
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 999
 switchport trunk allowed vlan 102,103,106
 switchport mode trunk
 logging event link-status
!
interface FastEthernet0
 no ip address
```

```
 no ip route-cache
 shutdown
!
interface GigabitEthernet1/0/1
 description RS232-A3560X Gig1/1
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 999
 switchport trunk allowed vlan 100,101,106
 switchport mode trunk
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
 channel-protocol lacp
 channel-group 10 mode active
!
interface GigabitEthernet1/0/2
 description RS232-A3560X-PR2 Gig1/1
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 999
 switchport trunk allowed vlan 102,103,106
 switchport mode trunk
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
 channel-protocol lacp
 channel-group 11 mode active
!
interface GigabitEthernet1/0/11
 description Link to RS232-2911-1 Gig0/2
 switchport trunk encapsulation dot1q
 switchport trunk allowed vlan 50,99
 switchport mode trunk
 ip arp inspection trust
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
 channel-group 1 mode on
 ip dhcp snooping trust
!
interface GigabitEthernet1/0/12
 description Link to RS232-2911-2 G0/2
 switchport trunk encapsulation dot1q
 switchport trunk allowed vlan 54,99
 switchport mode trunk
 ip arp inspection trust
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
 channel-group 2 mode on
 ip dhcp snooping trust
!
interface GigabitEthernet2/0/1
 description RS232-A3560X Gig1/2
 switchport trunk encapsulation dot1q
```

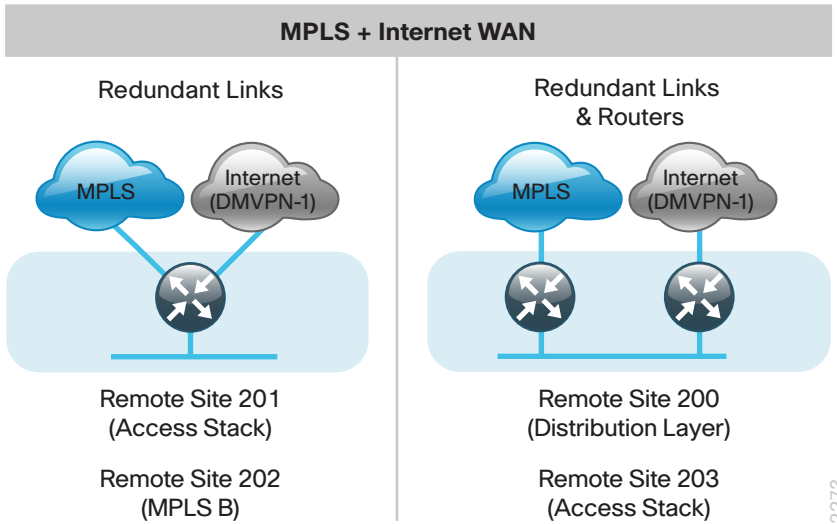
```
 switchport trunk native vlan 999
 switchport trunk allowed vlan 100,101,106
 switchport mode trunk
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
 channel-protocol lacp
 channel-group 10 mode active
!
interface GigabitEthernet2/0/2
 description RS232-A3560X-PR2 Gig1/3
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 999
 switchport trunk allowed vlan 102,103,106
 switchport mode trunk
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
 channel-protocol lacp
 channel-group 11 mode active
!
interface GigabitEthernet2/0/11
 description Link to RS232-2911-1 Gig0/1
 switchport trunk encapsulation dot1q
 switchport trunk allowed vlan 50,99
 switchport mode trunk
 ip arp inspection trust
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
 channel-group 1 mode on
 ip dhcp snooping trust
!
interface GigabitEthernet2/0/12
 description Link to RS232-2911-2 G0/1
 switchport trunk encapsulation dot1q
 switchport trunk allowed vlan 54,99
 switchport mode trunk
 ip arp inspection trust
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
 channel-group 2 mode on
 ip dhcp snooping trust
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan50
 ip address 10.5.208.2 255.255.255.252
 ip pim sparse-mode
!
interface Vlan54
```

```
 ip address 10.5.208.6 255.255.255.252
 ip pim sparse-mode
!
interface Vlan100
 ip address 10.5.209.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan101
 ip address 10.5.210.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan102
 ip address 10.5.211.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan103
 ip address 10.5.212.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan106
 ip address 10.5.215.1 255.255.255.128
 ip pim sparse-mode
!
!
router eigrp 100
 network 10.4.0.0 0.1.255.255
 passive-interface default
 no passive-interface Vlan50
 no passive-interface Vlan54
 eigrp router-id 10.5.215.254
!
!
no ip http server
ip http authentication aaa
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!
ip pim autorp listener
ip pim register-source Loopback0
ip tacacs source-interface Loopback0
!
ip sla responder
logging esm config
logging 10.4.48.35
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
tacacs server TACACS-SERVER-1
 address ipv4 10.4.48.15
 key 7 06350A225E4B1D32000E
!
!
line con 0
line vty 0 4
 transport preferred none
 transport input ssh
line vty 5 15
 transport preferred none
 transport input ssh
!
ntp source Loopback0
ntp server 10.4.48.17
!
end
```

WAN Remote-Site Devices - DMVPN Backup Dedicated Design Model (MPLS)

This section includes configuration files corresponding to the WAN remote-site design topologies as referenced in Figure 7. Each remote-site type has its respective devices grouped together along with any other relevant configuration information. The Autonomous System Number (ASN) used in Cisco SBA configurations is 65511.

Figure 7 - WAN remote-site designs - DMVPN Backup Dedicated (MPLS primary)



Notes

Table 12 - Remote-site WAN connection details - (MPLS + DMVPN remote sites)

Location	Net block	MPLS CE	MPLS PE	Carrier AS	DMVPN	LAN interfaces	Loopbacks
Remote Site 200 (Dual-router, dual-link with distribution layer)	10.5.0.0/21	(gig0/0) 192.168.3.17	192.168.3.18	65401 (A)	(gig0/0) DHCP	(gig0/1, gig0/2) (gig0/1, gig0/2)	10.255.251.200 (router 1) 10.255.253.200 (router 2)
Remote Site 201 (Single-router, dual-link with access-layer stack)	10.5.40.0/21	(gig0/0) 192.168.3.21	192.168.3.22	65401 (A)	(gig0/0) DHCP	(gig0/1, gig0/2)	10.255.251.201 (router)
Remote Site 202 (Single-router, dual-link)	10.5.64.0/21	(gig0/0) 192.168.4.5	192.168.4.6	65402 (B)	(gig0/1) DHCP	(gig0/2)	10.255.252.202 (router)
Remote Site 203 (Dual-router, dual-link with access-layer stack)	10.5.48.0/21	(gig0/0) 192.168.3.25	192.168.3.26	65401 (A)	(gig0/0) DHCP	(gig0/1, gig0/2) (gig0/1, gig0/2)	10.255.251.203 (router 1) 10.255.253.203 (router 2)

The following table lists the policed-rate link speeds for the remote-site QoS traffic shaping policies.

Table 13 - Remote-site policed-rate link speeds

Location	Net block	MPLS link speeds	DMVPN link speeds
Remote Site 200	10.5.0.0/21	50 Mbps	25 Mbps
Remote Site 201	10.5.40.0/21	10 Mbps	10 Mbps
Remote Site 202	10.5.64.0/21	10 Mbps	10 Mbps
Remote Site 203	10.5.48.0/21	20 Mbps	10 Mbps

Remote Site 200: Dual-Router, Dual-Link with Distribution Layer (MPLS + DMVPN)

Table 14 - Remote Site 200—IP address information

Location	Net block	Data wired subnet	Voice wired subnet	Loopbacks and switches
Remote Site 200	10.5.0.0/21	10.5.1.0/24 (VLAN 100) 10.5.3.0/24 (VLAN 102)	10.5.2.0/24 (VLAN 101) 10.5.4.0/24 (VLAN 103)	10.255.251.200 (router 1) 10.255.253.200 (router 2) 10.5.7.254 (distribution switch) 10.5.7.2 (access switch 1) 10.5.7.3 (access switch 2)

The following two tables provide additional information to connect to the distribution layer.

Table 15 - Remote Site 200—router connections to distribution layer

Remote-site information		Connection to distribution layer switch			Port-Channel subinterface and IP assignments		
Location	Net block	Router	Port channel	Member interfaces	Subinterface	VLAN	Network
Remote Site 200	10.5.0.0/21	RS200-3925-1	1	gig0/1 gig0/2	Port-channel1.50	50	10.5.0.0/30
					Port-channel1.99 (transit network)	99	10.5.0.8/30
		RS200-3925-2	2	gig0/1 gig0/2	Port-channel2.54	54	10.5.0.4/30
					Port-channel2.99 (transit network)	99	10.5.0.8/30

Table 16 - Remote Site 200—distribution layer switch connections

Port channel	Member interfaces	Layer3/Layer2 trunk	Connected device
1	ten3/1 ten4/1	Layer 2 (VLAN 50, 99)	RS200-3925-1
2	ten3/2 ten4/2	Layer 2 (VLAN 54, 99)	RS200-3925-2
10	ten1/1 ten2/1	Layer 2 (VLAN 100,101,106)	RS200-A3750X
11	ten1/2 ten2/2	Layer 2 (VLAN 102,103,106)	RS200-A3750X-PR1

RS200-3925-1

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS200-3925-1
!
boot-start-marker
boot-end-marker
!
!
enable secret 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrsw
!
aaa new-model
!
!
aaa group server tacacs+ TACACS-SERVERS
 server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
!
!
!
!
aaa session-id common
!
clock timezone PST -8 0
clock summer-time PDT recurring
!
no ipv6 cef
ipv6 spd queue min-threshold 62
ipv6 spd queue max-threshold 63
!
!
ip source-route
ip cef
!
!
!
ip multicast-routing
!
!
ip domain name cisco.local
!
multilink bundle-name authenticated
!
!
!
!
!
voice-card 0
!
!
!
!
!
!
!
license udi pid C3900-SPE100/K9 sn FOC14415C5Q
hw-module sm 2
!
!
!
username admin password 7 070C705F4D06485744
!
redundancy
!
!
!
!
```

```
ip ssh source-interface Loopback0
ip ssh version 2
!
class-map match-any DATA
 match  dscp af21
class-map match-any BGP-ROUTING
 match protocol bgp
class-map match-any INTERACTIVE-VIDEO
 match  dscp cs4  af41
class-map match-any CRITICAL-DATA
 match  dscp cs3  af31
class-map match-any VOICE
 match  dscp ef
class-map match-any SCAVENGER
 match  dscp cs1  af11
class-map match-any NETWORK-CRITICAL
 match  dscp cs2  cs6
!
!
policy-map MARK-BGP
 class BGP-ROUTING
  set dscp cs6
policy-map WAN
 class VOICE
  priority percent 10
 class INTERACTIVE-VIDEO
  priority percent 23
 class CRITICAL-DATA
  bandwidth percent 15
  random-detect dscp-based
 class DATA
  bandwidth percent 19
  random-detect dscp-based
 class SCAVENGER
  bandwidth percent 5
 class NETWORK-CRITICAL
  bandwidth percent 3
  service-policy MARK-BGP
 class class-default
  bandwidth percent 25
  random-detect
policy-map WAN-INTERFACE-G0/0
 class class-default
  shape average 50000000
  service-policy WAN
!
!
!
!
!
interface Loopback0
 ip address 10.255.251.200 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel1
 description EtherChannel link to RS200-D4507
 no ip address
 hold-queue 150 in
!
interface Port-channel1.50
 description R1 routed link to distribution layer
 encapsulation dot1Q 50
 ip address 10.5.0.1 255.255.255.252
 ip pim sparse-mode
 !
interface Port-channel1.99
 description Transit net
 encapsulation dot1Q 99
 ip address 10.5.0.9 255.255.255.252
 ip pim sparse-mode
!
interface GigabitEthernet0/0
 bandwidth 50000
 ip address 192.168.3.17 255.255.255.252
```

```
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/1
 description RS200-D4507 Ten3/1
 no ip address
 duplex auto
 speed auto
 channel-group 1
!
interface GigabitEthernet0/2
 description RS200-D4507 Ten4/1
 no ip address
 duplex auto
 speed auto
 channel-group 1
!
interface Vlan1
 no ip address
!
!
router eigrp 100
 default-metric 50000 100 255 1 1500
 network 10.5.0.0 0.0.255.255
 network 10.255.0.0 0.0.255.255
 redistribute bgp 65511
 passive-interface default
 no passive-interface Port-channel1.50
 no passive-interface Port-channel1.99
 eigrp router-id 10.255.251.200
!
router bgp 65511
 bgp router-id 10.255.251.200
 bgp log-neighbor-changes
 network 10.5.1.0 mask 255.255.255.0
 network 10.5.3.0 mask 255.255.255.0
 network 10.255.251.200 mask 255.255.255.255
 network 10.255.253.200 mask 255.255.255.255
 network 192.168.3.16 mask 255.255.255.252
 aggregate-address 10.5.0.0 255.255.248.0 summary-only
 neighbor 192.168.3.18 remote-as 65401
!
ip forward-protocol nd
!
ip pim autorp listener
ip pim register-source Loopback0
no ip http server
ip http authentication aaa
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!
ip tacacs source-interface Loopback0
!
!
logging 10.4.48.35
!
!
!
!
nls resp-timeout 1
cpd cr-id 1
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
tacacs server TACACS-SERVER-1
 address ipv4 10.4.48.15
 key 7 04680E051D2458650C00
!
!
!
control-plane
```

```
!
!
!
mgcp profile default
!
!
!
!
!
gatekeeper
 shutdown
!
!
!
line con 0
 logging synchronous
line aux 0
line vty 0 4
 transport preferred none
 transport input ssh
line vty 5 15
 transport preferred none
 transport input ssh
!
scheduler allocate 20000 1000
ntp source Loopback0
ntp server 10.4.48.17
end
```

RS200-3925-2

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS200-3925-2
!
boot-start-marker
boot-end-marker
!
!
enable secret 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrsw
!
aaa new-model
!
!
aaa group server tacacs+ TACACS-SERVERS
 server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
!
!
!
!
aaa session-id common
!
clock timezone PST -8 0
clock summer-time PDT recurring
!
no ipv6 cef
ipv6 spd queue min-threshold 62
ipv6 spd queue max-threshold 63
!
!
ip source-route
ip cef
!
!
!
ip vrf INET-PUBLIC1
 rd 65512:1
```

```
!
ip multicast-routing
!
!
ip domain name cisco.local
!
multilink bundle-name authenticated
!
!
!
!
!
voice-card 0
!
!
!
!
!
!
!
license udi pid C3900-SPE100/K9 sn FOC133932KA
!
!
username admin password 7 094F1F1A1A0A464058
!
redundancy
!
!
!
!
ip ssh source-interface Loopback0
ip ssh version 2
!
class-map match-any DATA
 match  dscp af21
class-map match-any BGP-ROUTING
 match protocol bgp
class-map match-any INTERACTIVE-VIDEO
 match  dscp cs4  af41
class-map match-any CRITICAL-DATA
 match  dscp cs3  af31
class-map match-any VOICE
 match  dscp ef
class-map match-any SCAVENGER
 match  dscp cs1  af11
class-map match-any NETWORK-CRITICAL
 match  dscp cs2  cs6
 match access-group name ISAKMP
!
!
policy-map WAN
 class VOICE
  priority percent 10
 class INTERACTIVE-VIDEO
  priority percent 23
 class CRITICAL-DATA
  bandwidth percent 15
  random-detect dscp-based
 class DATA
  bandwidth percent 19
  random-detect dscp-based
 class SCAVENGER
  bandwidth percent 5
 class NETWORK-CRITICAL
  bandwidth percent 3
 class class-default
  bandwidth percent 25
  random-detect
policy-map WAN-INTERFACE-G0/0
 class class-default
  shape average 25000000
  service-policy WAN
!
crypto keyring DMVPN-KEYRING1 vrf INET-PUBLIC1
```

```
  pre-shared-key address 0.0.0.0 0.0.0.0 key cisco123
!
crypto isakmp policy 10
 encr aes 256
 authentication pre-share
 group 2
crypto isakmp keepalive 30 5
crypto isakmp profile FVRF-ISAKMP-INET-PUBLIC1
   keyring DMVPN-KEYRING1
   match identity address 0.0.0.0 INET-PUBLIC1
!
!
crypto ipsec transform-set AES256/SHA/TRANSPORT esp-aes 256 esp-
sha-hmac
 mode transport
!
crypto ipsec profile DMVPN-PROFILE1
 set transform-set AES256/SHA/TRANSPORT
 set isakmp-profile FVRF-ISAKMP-INET-PUBLIC1
!
!
!
!
!
!
interface Loopback0
 ip address 10.255.253.200 255.255.255.255
 ip pim sparse-mode
!
interface Tunnel10
 bandwidth 25000
 ip address 10.4.34.200 255.255.254.0
 no ip redirects
 ip mtu 1400
 ip pim dr-priority 0
 ip pim nbma-mode
 ip pim sparse-mode
 ip hello-interval eigrp 200 20
 ip hold-time eigrp 200 60
 ip nhrp authentication cisco123
 ip nhrp map 10.4.34.1 172.16.130.1
 ip nhrp map multicast 172.16.130.1
 ip nhrp network-id 101
 ip nhrp holdtime 600
 ip nhrp nhs 10.4.34.1
 ip nhrp registration no-unique
 ip nhrp shortcut
 ip nhrp redirect
 ip tcp adjust-mss 1360
 ip summary-address eigrp 200 10.5.0.0 255.255.248.0
 tunnel source GigabitEthernet0/0
 tunnel mode gre multipoint
 tunnel vrf INET-PUBLIC1
 tunnel protection ipsec profile DMVPN-PROFILE1
!
interface Port-channel2
 description EtherChannel link to RS200-D4507
 no ip address
 hold-queue 150 in
!
interface Port-channel2.54
 description R2 routed link to RS200-D4507
 encapsulation dot1Q 54
 ip address 10.5.0.5 255.255.255.252
 ip pim sparse-mode
!
interface Port-channel2.99
 description Transit net
 encapsulation dot1Q 99
 ip address 10.5.0.10 255.255.255.252
 ip pim sparse-mode
!
interface GigabitEthernet0/0
 bandwidth 25000
```

```
 ip vrf forwarding INET-PUBLIC1
 ip address dhcp
 ip access-group ACL-INET-PUBLIC in
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/1
 description RS200-D4507 Ten3/2
 no ip address
 duplex auto
 speed auto
 channel-group 2
!
interface GigabitEthernet0/2
 description RS200-D4507 Ten4/2
 no ip address
 duplex auto
 speed auto
 channel-group 2
!
!
router eigrp 200
 network 10.4.34.0 0.0.1.255
 network 10.5.0.0 0.0.255.255
 network 10.255.0.0 0.0.255.255
 redistribute eigrp 100 route-map LOOPBACK-ONLY
 passive-interface default
 no passive-interface Tunnel10
 eigrp router-id 10.255.253.200
 eigrp stub connected summary redistributed
!
!
router eigrp 100
 network 10.5.0.0 0.0.255.255
 network 10.255.0.0 0.0.255.255
 redistribute eigrp 200
 passive-interface default
 no passive-interface Port-channel2.54
 no passive-interface Port-channel2.99
 eigrp router-id 10.255.253.200
!
ip forward-protocol nd
!
ip pim autorp listener
ip pim register-source Loopback0
no ip http server
ip http authentication aaa
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!
ip tacacs source-interface Loopback0
!
ip access-list standard R1-LOOPBACK
 permit 10.255.251.200
!
ip access-list extended ACL-INET-PUBLIC
 permit udp any any eq non500-isakmp
 permit udp any any eq isakmp
 permit esp any any
 permit udp any any eq bootpc
 permit icmp any any echo
 permit icmp any any echo-reply
 permit icmp any any ttl-exceeded
 permit icmp any any port-unreachable
 permit udp any any gt 1023 ttl eq 1
ip access-list extended ISAKMP
 permit udp any eq isakmp any eq isakmp
!
logging 10.4.48.35
!
!
!
```

```
!
nls resp-timeout 1
cpd cr-id 1
route-map LOOPBACK-ONLY permit 10
 match ip address R1-LOOPBACK
!
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
tacacs server TACACS-SERVER-1
 address ipv4 10.4.48.15
 key 7 0538030C33495A221C1C
!
!
!
control-plane
!
!
!
mgcp profile default
!
!
!
!
!
gatekeeper
 shutdown
!
!
!
line con 0
 logging synchronous
line aux 0
line vty 0 4
 transport preferred none
 transport input ssh
line vty 5 15
 transport preferred none
 transport input ssh
!
scheduler allocate 20000 1000
ntp source Loopback0
ntp server 10.4.48.17
end
```

RS200-D4507

```
version 15.1
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
service compress-config
!
hostname RS200-D4507
!
boot-start-marker
license boot level entservices
boot-end-marker
!
!
no logging console
enable secret 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrsw
!
username admin password 7 141443180F0B7B7977
aaa new-model
!
!
aaa group server tacacs+ TACACS-SERVERS
 server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
```

```
!
!
!
!
!
aaa session-id common
clock timezone PST -8 0
clock summer-time PDT recurring
udld enable

!
ip vrf mgmtVrf
!
ip multicast-routing
ip domain-name cisco.local
ip name-server 10.4.48.10
ip dhcp excluded-address 10.5.1.1 10.5.1.20
ip dhcp excluded-address 10.5.2.1 10.5.2.20
ip dhcp excluded-address 10.5.3.1 10.5.3.20
ip dhcp excluded-address 10.5.4.1 10.5.4.20
!
ip dhcp pool Data_VLAN_1
 network 10.5.1.0 255.255.255.0
 default-router 10.5.1.1
 domain-name cisco.local
 dns-server 10.4.48.10
!
ip dhcp pool Voice_VLAN_1
 network 10.5.2.0 255.255.255.0
 default-router 10.5.2.1
 domain-name cisco.local
 dns-server 10.4.48.10
!
ip dhcp pool Data_VLAN_2
 network 10.5.3.0 255.255.255.0
 default-router 10.5.3.1
 domain-name cisco.local
 dns-server 10.4.48.10
!
ip dhcp pool Voice_VLAN_2
 network 10.5.4.0 255.255.255.0
 default-router 10.5.4.1
 domain-name cisco.local
 dns-server 10.4.48.10
!
!
!
vtp mode transparent
!
power redundancy-mode redundant
!
!
!
!
!
!
spanning-tree mode rapid-pvst
spanning-tree portfast bpduguard default
spanning-tree extend system-id
spanning-tree vlan 1-4094 priority 24576
!
redundancy
 mode sso
!
vlan internal allocation policy ascending
!
vlan 50
 name R1-link
!
vlan 54
 name R2-link
!
vlan 99
 name Transit-net
```

```
!
vlan 100
 name Data1
!
vlan 101
 name Voice1
!
vlan 102
 name Data2
!
vlan 103
 name Voice2
!
vlan 106
 name Management
!
vlan 999
!
ip ssh source-interface Loopback0
ip ssh version 2
!
class-map match-any MULTIMEDIA-STREAMING-QUEUE
  match  dscp af31  af32  af33
class-map match-any CONTROL-MGMT-QUEUE
  match  dscp cs7
  match  dscp cs6
  match  dscp cs3
  match  dscp cs2
class-map match-any TRANSACTIONAL-DATA-QUEUE
  match  dscp af21  af22  af23
class-map match-any SCAVENGER-QUEUE
  match  dscp cs1
class-map match-any MULTIMEDIA-CONFERENCING-QUEUE
  match  dscp af41  af42  af43
class-map match-any BULK-DATA-QUEUE
  match  dscp af11  af12  af13
class-map match-any PRIORITY-QUEUE
  match  dscp ef
  match  dscp cs5
  match  dscp cs4
!
policy-map 1P7Q1T_Access
 class PRIORITY-QUEUE
    priority
    police cir percent 30
 class CONTROL-MGMT-QUEUE
    bandwidth remaining percent 10
 class MULTIMEDIA-CONFERENCING-QUEUE
    bandwidth remaining percent 10
 class MULTIMEDIA-STREAMING-QUEUE
    bandwidth remaining percent 10
 class TRANSACTIONAL-DATA-QUEUE
    bandwidth remaining percent 10
    dbl
 class BULK-DATA-QUEUE
    bandwidth remaining percent 4
    dbl
 class SCAVENGER-QUEUE
    bandwidth remaining percent 1
 class class-default
    bandwidth remaining percent 25
    dbl
!
policy-map 1P7Q1T
 class PRIORITY-QUEUE
    priority
 class CONTROL-MGMT-QUEUE
    bandwidth remaining percent 10
 class MULTIMEDIA-CONFERENCING-QUEUE
    bandwidth remaining percent 10
 class MULTIMEDIA-STREAMING-QUEUE
    bandwidth remaining percent 10
 class TRANSACTIONAL-DATA-QUEUE
    bandwidth remaining percent 10
```

```
    dbl
 class BULK-DATA-QUEUE
    bandwidth remaining percent 4
    dbl
 class SCAVENGER-QUEUE
    bandwidth remaining percent 1
 class class-default
    bandwidth remaining percent 25
    dbl
!
!
!
!
!
!
!
!
!
!
!
!
!
macro name AccessEdgeQoS
 auto qos voip cisco-phone
@
macro name EgressQoS
 service-policy output 1P7Q1T
@
!
!
interface Loopback0
 ip address 10.5.7.254 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel1
 description EtherChannel link to RS200-3925-1
 switchport
 switchport trunk allowed vlan 50,99
 switchport mode trunk
 ip arp inspection trust
 flowcontrol receive on
 spanning-tree portfast trunk
 ip dhcp snooping trust
!
interface Port-channel2
 description EtherChannel link to RS200-3925-2
 switchport
 switchport trunk allowed vlan 54,99
 switchport mode trunk
 flowcontrol receive on
 spanning-tree portfast trunk
!
interface Port-channel10
 description EtherChannel link to RS200-A3750X
 switchport
 switchport trunk native vlan 999
 switchport trunk allowed vlan 100,101,106
 switchport mode trunk
 logging event link-status
 flowcontrol receive on
!
interface Port-channel11
 description EtherChannel link to RS200-A3750X-PR1
 switchport
 switchport trunk native vlan 999
 switchport trunk allowed vlan 102,103,106
 switchport mode trunk
 logging event link-status
 flowcontrol receive on
!
interface FastEthernet1
 ip vrf forwarding mgmtVrf
 no ip address
 speed auto
```

```
 duplex auto
!
interface TenGigabitEthernet1/1
 description Link to RS200-A3750X Gig1/1/1
 switchport trunk native vlan 999
 switchport trunk allowed vlan 100,101,106
 switchport mode trunk
 logging event link-status
 logging event trunk-status
 macro description EgressQoS
 channel-protocol lacp
 channel-group 10 mode active
 service-policy output 1P7Q1T
!
interface TenGigabitEthernet1/2
 description Link to RS200-A3750X-PR1 Gig1/1/1
 switchport trunk native vlan 999
 switchport trunk allowed vlan 102,103,106
 switchport mode trunk
 logging event link-status
 logging event trunk-status
 macro description EgressQoS
 channel-protocol lacp
 channel-group 11 mode active
 service-policy output 1P7Q1T
!
interface TenGigabitEthernet2/1
 description Link to RS200-A3750X Gig2/1/1
 switchport trunk native vlan 999
 switchport trunk allowed vlan 100,101,106
 switchport mode trunk
 logging event link-status
 logging event trunk-status
 macro description EgressQoS
 channel-protocol lacp
 channel-group 10 mode active
 service-policy output 1P7Q1T
!
interface TenGigabitEthernet2/2
 description Link to RS200-A3750X-PR1 Gig1/1/2
 switchport trunk native vlan 999
 switchport trunk allowed vlan 102,103,106
 switchport mode trunk
 logging event link-status
 logging event trunk-status
 macro description EgressQoS
 channel-protocol lacp
 channel-group 11 mode active
 service-policy output 1P7Q1T
!
interface TenGigabitEthernet3/1
 description Link to RS200-3925-1 Gig0/1
 switchport trunk allowed vlan 50,99
 switchport mode trunk
 ip arp inspection trust
 logging event link-status
 logging event trunk-status
 macro description EgressQoS
 channel-group 1 mode on
 service-policy output 1P7Q1T
 ip dhcp snooping trust
!
interface TenGigabitEthernet3/2
 description Link to RS200-3925-2 Gig0/1
 switchport trunk allowed vlan 54,99
 switchport mode trunk
 logging event link-status
 logging event trunk-status
 macro description EgressQoS
 channel-group 2 mode on
 service-policy output 1P7Q1T
!
interface TenGigabitEthernet4/1
 description Link to RS200-3925-1 Gig0/2
```

```
 switchport trunk allowed vlan 50,99
 switchport mode trunk
 ip arp inspection trust
 logging event link-status
 logging event trunk-status
 macro description EgressQoS
 channel-group 1 mode on
 service-policy output 1P7Q1T
 ip dhcp snooping trust
!
interface TenGigabitEthernet4/2
 description Link to RS200-3925-2 Gig0/2
 switchport trunk allowed vlan 54,99
 switchport mode trunk
 logging event link-status
 logging event trunk-status
 macro description EgressQoS
 channel-group 2 mode on
 service-policy output 1P7Q1T
!
interface Vlan1
 no ip address
!
interface Vlan50
 ip address 10.5.0.2 255.255.255.252
 ip pim sparse-mode
!
interface Vlan54
 ip address 10.5.0.6 255.255.255.252
 ip pim sparse-mode
!
interface Vlan100
 ip address 10.5.1.1 255.255.255.0
 ip pim sparse-mode
!
interface Vlan101
 ip address 10.5.2.1 255.255.255.0
 ip pim sparse-mode
!
interface Vlan102
 ip address 10.5.3.1 255.255.255.0
 ip pim sparse-mode
!
interface Vlan103
 ip address 10.5.4.1 255.255.255.0
 ip pim sparse-mode
!
interface Vlan106
 description RS200 Management VLAN
 ip address 10.5.7.1 255.255.255.128
 ip pim sparse-mode
!
!
router eigrp 100
 network 10.5.0.0 0.0.255.255
 redistribute static route-map static-to-eigrp
 passive-interface default
 no passive-interface Vlan50
 no passive-interface Vlan54
 eigrp router-id 10.5.7.254
 nsf
!
no ip http server
ip http authentication aaa
ip http secure-server
ip pim autorp listener
ip pim register-source Loopback0
!
ip tacacs source-interface Loopback0
!
logging 10.4.48.35
!
!
snmp-server community cisco RO
```

```
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
snmp-server host 10.4.48.35 cisco123
!
tacacs server TACACS-SERVER-1
 address ipv4 10.4.48.15
 key 7 13361211190910012E3D
!
!
!
line con 0
 exec-timeout 120 0
 stopbits 1
line vty 0 4
 transport preferred none
 transport input ssh
line vty 5 15
 transport preferred none
 transport input ssh
!
ntp source Loopback0
ntp update-calendar
ntp server 10.4.48.17
end
```

Remote Site 201: Single-Router, Dual-Link with Access-Layer Stack (MPLS + DMVPN)

Table 17 - Remote Site 201—IP address information

Location	Net block	Data wired subnet	Voice wired subnet	Loopbacks and switches
Remote Site 201	10.5.40.0/21	10.5.44.0/24 (VLAN 64)	10.5.45.0/24 (VLAN 69)	10.255.251.201 (router) 10.5.44.5 (access switch)

RS201-2911

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS201-2911
!
boot-start-marker
boot-end-marker
!
!
enable secret 5 $1$Rmfp$Btut/0xCUYDOmlruhEsPt1
!
aaa new-model
!
!
aaa group server tacacs+ TACACS-SERVERS
 server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
!
!
!
!
aaa session-id common
!
clock timezone PST -8 0
clock summer-time PDT recurring
!
no ipv6 cef
ipv6 spd queue min-threshold 62
ipv6 spd queue max-threshold 63
!
```

```
ip source-route
ip auth-proxy max-login-attempts 5
ip admission max-login-attempts 5
ip cef
!
!
!
ip vrf INET-PUBLIC1
 rd 65512:1
!
ip multicast-routing
!
!
ip domain name cisco.local
ip name-server 10.4.48.10
!
multilink bundle-name authenticated
!
!
!
!
!
voice-card 0
!
!
!
!
!
!
!
license udi pid CISCO2911/K9 sn FTX1347A1TN
license boot module c2900 technology-package datak9
hw-module sm 1
!
!
!
username admin password 7 04585A150C2E1D1C5A
!
redundancy
!
!
!
!
ip ssh source-interface Loopback0
ip ssh version 2
!
class-map match-any DATA
 match  dscp af21
class-map match-any BGP-ROUTING
 match protocol bgp
class-map match-any INTERACTIVE-VIDEO
 match  dscp cs4  af41
class-map match-any CRITICAL-DATA
 match  dscp cs3  af31
class-map match-any VOICE
 match  dscp ef
class-map match-any SCAVENGER
 match  dscp cs1  af11
class-map match-any NETWORK-CRITICAL
 match  dscp cs2  cs6
 match access-group name ISAKMP
!
!
policy-map MARK-BGP
 class BGP-ROUTING
  set dscp cs6
policy-map WAN
 class VOICE
  priority percent 10
 class INTERACTIVE-VIDEO
  priority percent 23
 class CRITICAL-DATA
  bandwidth percent 15
  random-detect dscp-based
```

```
 class DATA
  bandwidth percent 19
  random-detect dscp-based
 class SCAVENGER
  bandwidth percent 5
 class NETWORK-CRITICAL
  bandwidth percent 3
  service-policy MARK-BGP
 class class-default
  bandwidth percent 25
  random-detect
policy-map WAN-INTERFACE-G0/0/0
 class class-default
  shape average 10000000
  service-policy WAN
policy-map WAN-INTERFACE-G0/0
 class class-default
  shape average 10000000
  service-policy WAN
!
!
crypto keyring DMVPN-KEYRING1 vrf INET-PUBLIC1
  pre-shared-key address 0.0.0.0 0.0.0.0 key cisco123
!
crypto isakmp policy 10
 encr aes 256
 authentication pre-share
 group 2
!
crypto isakmp keepalive 30 5
crypto isakmp profile FVRF-ISAKMP-INET-PUBLIC1
   keyring DMVPN-KEYRING1
   match identity address 0.0.0.0 INET-PUBLIC1
!
!
crypto ipsec transform-set AES256/SHA/TRANSPORT esp-aes 256 esp-
sha-hmac
 mode transport
!
crypto ipsec profile DMVPN-PROFILE1
 set transform-set AES256/SHA/TRANSPORT
 set isakmp-profile FVRF-ISAKMP-INET-PUBLIC1
!
!
!
!
interface Loopback0
 ip address 10.255.251.201 255.255.255.255
 ip pim sparse-mode
!
interface Tunnel10
 bandwidth 10000
 ip address 10.4.34.201 255.255.254.0
 no ip redirects
 ip mtu 1400
 ip pim dr-priority 0
 ip pim nbma-mode
 ip pim sparse-mode
 ip hello-interval eigrp 200 20
 ip hold-time eigrp 200 60
 ip nhrp authentication cisco123
 ip nhrp map multicast 172.16.130.1
 ip nhrp map 10.4.34.1 172.16.130.1
 ip nhrp network-id 101
 ip nhrp holdtime 600
 ip nhrp nhs 10.4.34.1
 ip nhrp registration no-unique
 ip nhrp shortcut
 ip nhrp redirect
 ip tcp adjust-mss 1360
 ip summary-address eigrp 200 10.5.40.0 255.255.248.0
 tunnel source GigabitEthernet0/0/0
 tunnel mode gre multipoint
 tunnel vrf INET-PUBLIC1
```

```
 tunnel protection ipsec profile DMVPN-PROFILE1
!
interface Port-channel1
 description EtherChannel link to RS201-A2960S
 no ip address
 hold-queue 150 in
!
interface Port-channel1.64
 description Wired Data
 encapsulation dot1Q 64
 ip address 10.5.44.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Port-channel1.69
 description Wired Voice
 encapsulation dot1Q 69
 ip address 10.5.45.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface GigabitEthernet0/0
 bandwidth 10000
 ip address 192.168.3.21 255.255.255.252
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/1
 description RS201-A2960S Gig2/0/24
 no ip address
 duplex auto
 speed auto
 channel-group 1
!
interface GigabitEthernet0/2
 description RS201-A2960S Gig1/0/24
 no ip address
 duplex auto
 speed auto
 channel-group 1
!
interface GigabitEthernet0/0/0
 bandwidth 10000
 ip vrf forwarding INET-PUBLIC1
 ip address dhcp
 ip access-group ACL-INET-PUBLIC in
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/0/0
!
interface Vlan1
 no ip address
!
!
!
router eigrp 200
 network 10.4.34.0 0.0.1.255
 network 10.5.0.0 0.0.255.255
 network 10.255.0.0 0.0.255.255
 passive-interface default
 no passive-interface Tunnel10
 eigrp router-id 10.255.251.201
 eigrp stub connected summary
!
router bgp 65511
 bgp router-id 10.255.251.201
 bgp log-neighbor-changes
 network 10.5.44.0 mask 255.255.255.0
 network 10.5.45.0 mask 255.255.255.0
 network 10.255.251.201 mask 255.255.255.255
 network 192.168.3.20 mask 255.255.255.252
```

```
 aggregate-address 10.5.40.0 255.255.248.0 summary-only
 neighbor 192.168.3.22 remote-as 65401
!
ip forward-protocol nd
!
ip pim autorp listener
ip pim register-source Loopback0
no ip http server
ip http authentication aaa
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!
ip tacacs source-interface Loopback0
!
ip access-list extended ACL-INET-PUBLIC
 permit udp any any eq non500-isakmp
 permit udp any any eq isakmp
 permit esp any any
 permit udp any any eq bootpc
 permit icmp any any echo
 permit icmp any any echo-reply
 permit icmp any any ttl-exceeded
 permit icmp any any port-unreachable
 permit udp any any gt 1023 ttl eq 1
ip access-list extended ISAKMP
 permit udp any eq isakmp any eq isakmpip sla responder
!
logging 10.4.48.35
access-list 55 permit 10.4.48.0 0.0.0.255
!
!
!
!
!
snmp-server community cisco RO 55
snmp-server community cisco123 RW 55
snmp-server trap-source Loopback0
tacacs server TACACS-SERVER-1
 address ipv4 10.4.48.15
 key 7 0538030C33495A221C1C
!
!
!
control-plane
!
!
!
mgcp profile default
!
!
!
!
!
gatekeeper
 shutdown
!
!
!
line con 0
 logging synchronous
line aux 0
line vty 0 4
 access-class 55 in
 transport preferred none
 transport input ssh
line vty 5 15
 access-class 55 in
 transport preferred none
 transport input ssh
!
scheduler allocate 20000 1000
ntp source Loopback0
ntp server 10.4.48.17
!
end
```

Remote Site 202: Single-Router, Dual-Link (MPLS + DMVPN)

Table 18 - Remote Site 202—IP address information

Location	Net block	Data wired subnet	Voice wired subnet	Loopbacks and switches
Remote Site 202	10.5.64.0/21	10.5.68.0/24 (VLAN 64)	10.5.69.0/24 (VLAN 69)	10.255.252.202 (router) 10.5.68.5 (access switch)

RS202-2911

```
version 15.1
service config
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS202-2911
!
boot-start-marker
boot-end-marker
!
!
enable secret 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrsw
!
aaa new-model
!
!
aaa group server tacacs+ TACACS-SERVERS
 server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
!
!
!
!
aaa session-id common
!
clock timezone PST -8 0
clock summer-time PDT recurring
!
no ipv6 cef
ip source-route
ip cef
!
!
!
ip vrf INET-PUBLIC1
 rd 65512:1
!
ip multicast-routing
!
!
ip domain name cisco.local
!
multilink bundle-name authenticated
!
!
!
!
!
voice-card 0
!
!
!
!
!
!
!
```

```
license udi pid CISCO2911/K9 sn FTX1347A1TC
!
!
username admin password 7 0205554808095E731F
!
redundancy
!
!
!
!
ip ssh source-interface Loopback0
ip ssh version 2
!
class-map match-any DATA
 match  dscp af21
class-map match-any BGP-ROUTING
 match protocol bgp
class-map match-any INTERACTIVE-VIDEO
 match  dscp cs4  af41
class-map match-any CRITICAL-DATA
 match  dscp cs3  af31
class-map match-any VOICE
 match  dscp ef
class-map match-any SCAVENGER
 match  dscp cs1  af11
class-map match-any NETWORK-CRITICAL
 match  dscp cs2  cs6
 match access-group name ISAKMP
!
!
policy-map MARK-BGP
 class BGP-ROUTING
  set dscp cs6
policy-map WAN
 class VOICE
  priority percent 10
 class INTERACTIVE-VIDEO
  priority percent 23
 class CRITICAL-DATA
  bandwidth percent 15
  random-detect dscp-based
 class DATA
  bandwidth percent 19
  random-detect dscp-based
 class SCAVENGER
  bandwidth percent 5
 class NETWORK-CRITICAL
  bandwidth percent 3
  service-policy MARK-BGP
 class class-default
  bandwidth percent 25
  random-detect
policy-map WAN-INTERFACE-G0/1
 class class-default
  shape average 10000000
  service-policy WAN
policy-map WAN-INTERFACE-G0/0
 class class-default
  shape average 10000000
  service-policy WAN
!
!
crypto keyring DMVPN-KEYRING1 vrf INET-PUBLIC1
  pre-shared-key address 0.0.0.0 0.0.0.0 key cisco123
!
crypto isakmp policy 10
 encr aes 256
 authentication pre-share
 group 2
!
crypto isakmp keepalive 30 5
crypto isakmp profile FVRF-ISAKMP-INET-PUBLIC1
   keyring DMVPN-KEYRING1
   match identity address 0.0.0.0 INET-PUBLIC1
```

```
!
!
crypto ipsec transform-set AES256/SHA/TRANSPORT esp-aes 256 esp-
sha-hmac
 mode transport
!
crypto ipsec profile DMVPN-PROFILE1
 set transform-set AES256/SHA/TRANSPORT
 set isakmp-profile FVRF-ISAKMP-INET-PUBLIC1
!
!
!
!
!
interface Loopback0
 ip address 10.255.252.202 255.255.255.255
 ip pim sparse-mode
!
interface Tunnel10
 bandwidth 10000
 ip address 10.4.34.202 255.255.254.0
 no ip redirects
 ip mtu 1400
 ip pim dr-priority 0
 ip pim nbma-mode
 ip pim sparse-mode
 ip hello-interval eigrp 200 20
 ip hold-time eigrp 200 60
 ip nhrp authentication cisco123
 ip nhrp map multicast 172.16.130.1
 ip nhrp map 10.4.34.1 172.16.130.1
 ip nhrp network-id 101
 ip nhrp holdtime 600
 ip nhrp nhs 10.4.34.1
 ip nhrp registration no-unique
 ip nhrp shortcut
 ip nhrp redirect
 ip tcp adjust-mss 1360
 ip summary-address eigrp 200 10.5.64.0 255.255.248.0
 tunnel source GigabitEthernet0/1
 tunnel mode gre multipoint
 tunnel vrf INET-PUBLIC1
 tunnel protection ipsec profile DMVPN-PROFILE1
!
interface GigabitEthernet0/0
 bandwidth 10000
 ip address 192.168.4.5 255.255.255.252
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/1
 bandwidth 10000
 ip vrf forwarding INET-PUBLIC1
 ip address dhcp
 ip access-group ACL-INET-PUBLIC in
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/1
!
interface GigabitEthernet0/2
 no ip address
 duplex auto
 speed auto
!
interface GigabitEthernet0/2.64
 description Wired Data
 encapsulation dot1Q 64
 ip address 10.5.68.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
```

```
interface GigabitEthernet0/2.69
 description Wired Voice
 encapsulation dot1Q 69
 ip address 10.5.69.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
!
router eigrp 200
 network 10.4.34.0 0.0.1.255
 network 10.5.0.0 0.0.255.255
 network 10.255.0.0 0.0.255.255
 passive-interface default
 no passive-interface Tunnel10
 eigrp router-id 10.255.252.202
 eigrp stub connected summary
!
router bgp 65511
 bgp router-id 10.255.252.202
 bgp log-neighbor-changes
 network 10.5.68.0 mask 255.255.255.0
 network 10.5.69.0 mask 255.255.255.0
 network 10.255.252.202 mask 255.255.255.255
 network 192.168.4.4 mask 255.255.255.252
 aggregate-address 10.5.64.0 255.255.248.0 summary-only
 neighbor 192.168.4.6 remote-as 65402
!
ip forward-protocol nd
!
ip pim autorp listener
ip pim register-source Loopback0
no ip http server
ip http authentication aaa
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!
ip tacacs source-interface Loopback0
!
ip access-list extended ACL-INET-PUBLIC
 permit udp any any eq non500-isakmp
 permit udp any any eq isakmp
 permit esp any any
 permit udp any any eq bootpc
 permit icmp any any echo
 permit icmp any any echo-reply
 permit icmp any any ttl-exceeded
 permit icmp any any port-unreachable
 permit udp any any gt 1023 ttl eq 1
ip access-list extended ISAKMP
 permit udp any eq isakmp any eq isakmp
!
logging 10.4.48.35
!
!
!
!
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
tacacs server TACACS-SERVER-1
 address ipv4 10.4.48.15
 key 7 122A0014000E182F2F32
!
!
!
control-plane
!
!
!
mgcp profile default
!
!
!
```

```
!
!
gatekeeper
 shutdown
!
!
!
line con 0
 logging synchronous
line aux 0
line vty 0 4
 transport preferred none
 transport input ssh
line vty 5 15
 transport preferred none
 transport input ssh
!
scheduler allocate 20000 1000
ntp source Loopback0
ntp server 10.4.48.17
!
End
```

Remote Site 203: Dual-Router, Dual-Link with Access Layer Stack (MPLS + DMVPN)

Table 19 - Remote Site 203—IP address information

Location	Net block	Data wired subnet	Voice wired subnet	Loopbacks and switches
Remote Site 203	10.5.48.0/21	10.5.52.0/24 (VLAN 64)	10.5.53.0/24 (VLAN 69)	10.255.251.203 (router 1) 10.255.253.203 (router 2) 10.5.52.5 (access switch)

RS203-2921-1

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS203-2921-1
!
boot-start-marker
boot-end-marker
!
!
enable secret 5 $1$pjO/$nqa8fNoI84ek9xadTFdVw.
!
aaa new-model
!
!
aaa group server tacacs+ TACACS-SERVERS
 server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
!
!
!
!
aaa session-id common
!
clock timezone PST -8 0
clock summer-time PDT recurring
!
no ipv6 cef
ipv6 spd queue min-threshold 62
ipv6 spd queue max-threshold 63
ip source-route
```

```
ip auth-proxy max-login-attempts 5
ip admission max-login-attempts 5
ip cef
!
!
!
ip multicast-routing
!
!
ip domain name cisco.local
!
multilink bundle-name authenticated
!
!
!
!
voice-card 0
!
!
!
!
!
!
!
license udi pid CISCO2921/K9 sn FTX1446AKCZ
license boot module c2900 technology-package securityk9
hw-module sm 1
!
!
!
username admin password 7 0508571C22431F5B4A
!
redundancy
!
!
!
!
ip ssh source-interface Loopback0
ip ssh version 2
!
track 50 ip sla 100 reachability
!
class-map match-any DATA
 match  dscp af21
class-map match-any BGP-ROUTING
 match protocol bgp
class-map match-any INTERACTIVE-VIDEO
 match  dscp cs4  af41
class-map match-any CRITICAL-DATA
 match  dscp cs3  af31
class-map match-any VOICE
 match  dscp ef
class-map match-any SCAVENGER
 match  dscp cs1  af11
class-map match-any NETWORK-CRITICAL
 match  dscp cs2  cs6
!
!
policy-map MARK-BGP
 class BGP-ROUTING
  set dscp cs6
policy-map WAN
 class VOICE
  priority percent 10
 class INTERACTIVE-VIDEO
  priority percent 23
 class CRITICAL-DATA
  bandwidth percent 15
  random-detect dscp-based
 class DATA
  bandwidth percent 19
  random-detect dscp-based
 class SCAVENGER
  bandwidth percent 5
```

```
 class NETWORK-CRITICAL
  bandwidth percent 3
  service-policy MARK-BGP
 class class-default
  bandwidth percent 25
  random-detect
policy-map WAN-INTERFACE-G0/0
 class class-default
  shape average 20000000
  service-policy WAN
!
!
!
!
!
!
interface Loopback0
 ip address 10.255.251.203 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel1
 description EtherChannel link to RS203-A3750X
 no ip address
 hold-queue 150 in
!
interface Port-channel1.64
 description Wired Data
 encapsulation dot1Q 64
 ip address 10.5.52.2 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim dr-priority 110
 ip pim sparse-mode
 standby version 2
 standby 1 ip 10.5.52.1
 standby 1 priority 110
 standby 1 preempt
 standby 1 authentication md5 key-string 7 130646010803557878
 standby 1 track 50 decrement 10
!
interface Port-channel1.69
 description Wired Voice
 encapsulation dot1Q 69
 ip address 10.5.53.2 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim dr-priority 110
 ip pim sparse-mode
 standby version 2
 standby 1 ip 10.5.53.1
 standby 1 priority 110
 standby 1 preempt
 standby 1 authentication md5 key-string 7 141443180F0B7B7977
 standby 1 track 50 decrement 10
!
interface Port-channel1.99
 encapsulation dot1Q 99
 ip address 10.5.48.1 255.255.255.252
 ip pim sparse-mode
!
interface GigabitEthernet0/0
 bandwidth 20000
 ip address 192.168.3.25 255.255.255.252
 ip pim sparse-mode
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/1
 description RS203-A3750X Gig1/0/23
 no ip address
 duplex auto
 speed auto
 channel-group 1
!
```

```
interface GigabitEthernet0/2
 description RS203-A3750X Gig2/0/23
 no ip address
 duplex auto
 speed auto
 channel-group 1
!
!
interface Vlan1
 no ip address
!
!
router eigrp 100
 default-metric 20000 100 255 1 1500
 network 10.4.0.0 0.1.255.255
 network 10.255.0.0 0.0.255.255
 redistribute bgp 65511
 passive-interface default
 no passive-interface Port-channel1.99
 eigrp router-id 10.255.251.203
!
router bgp 65511
 bgp router-id 10.255.251.203
 bgp log-neighbor-changes
 network 10.5.52.0 mask 255.255.255.0
 network 10.5.53.0 mask 255.255.255.0
 network 10.255.251.203 mask 255.255.255.255
 network 10.255.253.203 mask 255.255.255.255
 network 192.168.3.24 mask 255.255.255.252
 aggregate-address 10.5.48.0 255.255.248.0 summary-only
 neighbor 192.168.3.26 remote-as 65401
!
ip forward-protocol nd
!
ip pim autorp listener
ip pim register-source Loopback0
no ip http server
ip http authentication aaa
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!
ip tacacs source-interface Loopback0
!
!
ip sla 100
 icmp-echo 192.168.3.26 source-interface GigabitEthernet0/0
 threshold 1000
 timeout 1000
 frequency 15
ip sla schedule 100 life forever start-time now
logging 10.4.48.35
!
!
!
!
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
tacacs server TACACS-SERVER-1
 address ipv4 10.4.48.15
 key 7 03375E08140A35674B10
!
!
!
control-plane
!
!
!
mgcp profile default
!
!
!
!
```

```
!
gatekeeper
 shutdown
!
!
!
line con 0
 logging synchronous
line aux 0
line vty 0 4
 transport preferred none
 transport input ssh
line vty 5 15
 transport preferred none
 transport input ssh
!
scheduler allocate 20000 1000
ntp source Loopback0
ntp server 10.4.48.17
!
end
```

RS203-2921-2

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS203-2921-2
!
boot-start-marker
boot-end-marker
!
!
enable secret 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrsw
!
aaa new-model
!
!
aaa group server tacacs+ TACACS-SERVERS
 server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
!
!
!
!
aaa session-id common
!
clock timezone PST -8 0
clock summer-time PDT recurring
!
no ipv6 cef
ip source-route
ip auth-proxy max-login-attempts 5
ip admission max-login-attempts 5
ip cef
!
!
!
ip vrf INET-PUBLIC1
 rd 65512:1
!
ip multicast-routing
!
!
ip domain name cisco.local
!
multilink bundle-name authenticated
!
```

```
!
!
!
voice-card 0
!
!
!
!
!
!
!
license udi pid CISCO2921/K9 sn FTX1348AHMM
hw-module sm 1
!
!
!
username admin password 7 0508571C22431F5B4A
!
redundancy
!
!
!
!
ip ssh source-interface Loopback0
ip ssh version 2
!
class-map match-any DATA
 match  dscp af21
class-map match-any BGP-ROUTING
 match protocol bgp
class-map match-any INTERACTIVE-VIDEO
 match  dscp cs4  af41
class-map match-any CRITICAL-DATA
 match  dscp cs3  af31
class-map match-any VOICE
 match  dscp ef
class-map match-any SCAVENGER
 match  dscp cs1  af11
class-map match-any NETWORK-CRITICAL
 match  dscp cs2  cs6
 match access-group name ISAKMP
!
!
policy-map WAN
 class VOICE
  priority percent 10
 class INTERACTIVE-VIDEO
  priority percent 23
 class CRITICAL-DATA
  bandwidth percent 15
  random-detect dscp-based
 class DATA
  bandwidth percent 19
  random-detect dscp-based
 class SCAVENGER
  bandwidth percent 5
 class NETWORK-CRITICAL
  bandwidth percent 3
 class class-default
  bandwidth percent 25
  random-detect
policy-map WAN-INTERFACE-G0/0
 class class-default
  shape average 10000000
  service-policy WAN
!
!
crypto keyring DMVPN-KEYRING1 vrf INET-PUBLIC1
  pre-shared-key address 0.0.0.0 0.0.0.0 key cisco123
!
crypto isakmp policy 10
 encr aes 256
 authentication pre-share
 group 2
```

```
crypto isakmp keepalive 30 5
crypto isakmp profile FVRF-ISAKMP-INET-PUBLIC1
   keyring DMVPN-KEYRING1
   match identity address 0.0.0.0 INET-PUBLIC1
!
!
crypto ipsec transform-set AES256/SHA/TRANSPORT esp-aes 256 esp-
sha-hmac
 mode transport
!
crypto ipsec profile DMVPN-PROFILE1
 set transform-set AES256/SHA/TRANSPORT
 set isakmp-profile FVRF-ISAKMP-INET-PUBLIC1
!
!
!
!
!
!
interface Loopback0
 ip address 10.255.253.203 255.255.255.255
 ip pim sparse-mode
!
interface Tunnel10
 bandwidth 10000
 ip address 10.4.34.203 255.255.254.0
 no ip redirects
 ip mtu 1400
 ip pim dr-priority 0
 ip pim nbma-mode
 ip pim sparse-mode
 ip hello-interval eigrp 200 20
 ip hold-time eigrp 200 60
 ip nhrp authentication cisco123
 ip nhrp map multicast 172.16.130.1
 ip nhrp map 10.4.34.1 172.16.130.1
 ip nhrp network-id 101
 ip nhrp holdtime 600
 ip nhrp nhs 10.4.34.1
 ip nhrp registration no-unique
 ip nhrp shortcut
 ip nhrp redirect
 ip tcp adjust-mss 1360
 ip summary-address eigrp 200 10.5.48.0 255.255.248.0
 tunnel source GigabitEthernet0/0
 tunnel mode gre multipoint
 tunnel vrf INET-PUBLIC1
 tunnel protection ipsec profile DMVPN-PROFILE1
!
interface Port-channel2
 description EtherChannel link to RS203-A3750X
 no ip address
 hold-queue 150 in
!
interface Port-channel2.64
 description Wired Data
 encapsulation dot1Q 64
 ip address 10.5.52.3 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim dr-priority 105
 ip pim sparse-mode
 standby version 2
 standby 1 ip 10.5.52.1
 standby 1 priority 105
 standby 1 preempt
 standby 1 authentication md5 key-string 7 130646010803557878
!
interface Port-channel2.69
 description Wired Voice
 encapsulation dot1Q 69
 ip address 10.5.53.3 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim dr-priority 105
 ip pim sparse-mode
```

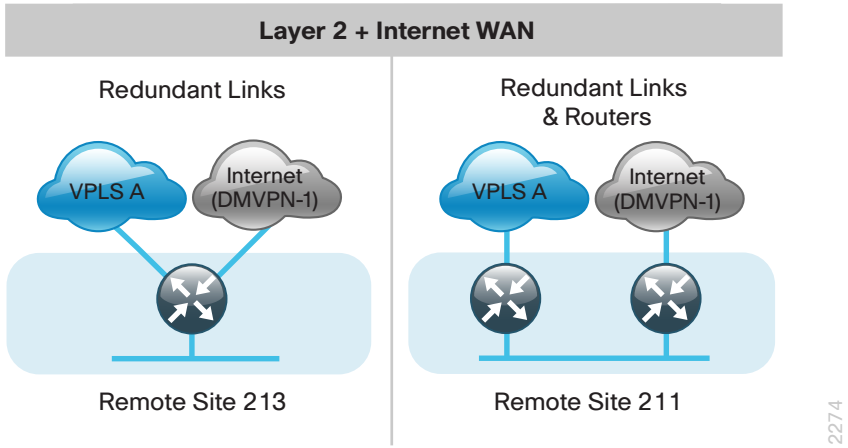
```
 standby version 2
 standby 1 ip 10.5.53.1
 standby 1 priority 105
 standby 1 preempt
 standby 1 authentication md5 key-string 7 130646010803557878
!
interface Port-channel2.99
 description Transit Net
 encapsulation dot1Q 99
 ip address 10.5.48.2 255.255.255.252
 ip pim sparse-mode
!
interface GigabitEthernet0/0
 ip vrf forwarding INET-PUBLIC1
 ip address dhcp
 ip access-group ACL-INET-PUBLIC in
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/1
 description RS203-A3750X Gig2/0/24
 no ip address
 duplex auto
 speed auto
 channel-group 2
!
interface GigabitEthernet0/2
 description RS203-A3750X Gig1/0/24
 no ip address
 duplex auto
 speed auto
 channel-group 2
!
!
interface Vlan1
 no ip address
!
!
router eigrp 200
 network 10.4.34.0 0.0.1.255
 network 10.5.0.0 0.0.255.255
 network 10.255.0.0 0.0.255.255
 redistribute eigrp 100 route-map LOOPBACK-ONLY
 passive-interface default
 no passive-interface Tunnel10
 eigrp router-id 10.255.253.203
 eigrp stub connected summary redistributed
!
!
router eigrp 100
 network 10.4.0.0 0.1.255.255
 network 10.255.0.0 0.0.255.255
 redistribute eigrp 200
 passive-interface default
 no passive-interface Port-channel2.99
 eigrp router-id 10.255.253.203
!
ip forward-protocol nd
!
ip pim autorp listener
ip pim register-source Loopback0
no ip http server
ip http authentication aaa
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!
ip tacacs source-interface Loopback0
!
ip access-list standard R1-LOOPBACK
 permit 10.255.251.203
!
ip access-list extended ACL-INET-PUBLIC
```

```
 permit udp any any eq non500-isakmp
 permit udp any any eq isakmp
 permit esp any any
 permit udp any any eq bootpc
 permit icmp any any echo
 permit icmp any any echo-reply
 permit icmp any any ttl-exceeded
 permit icmp any any port-unreachable
 permit udp any any gt 1023 ttl eq 1
ip access-list extended ISAKMP
 permit udp any eq isakmp any eq isakmp
!
logging 10.4.48.35
!
!
!
!
route-map LOOPBACK-ONLY permit 10
 match ip address R1-LOOPBACK
!
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
tacacs server TACACS-SERVER-1
 address ipv4 10.4.48.15
 key 7 107D0C1A17120620091D
!
!
!
control-plane
!
!
!
mgcp profile default
!
!
!
!
!
gatekeeper
 shutdown
!
!
!
line con 0
 logging synchronous
line aux 0
line vty 0 4
 transport preferred none
 transport input ssh
line vty 5 15
 transport preferred none
 transport input ssh
!
scheduler allocate 20000 1000
ntp source Loopback0
ntp server 10.4.48.17
!
end
```

WAN Remote-Site Devices - DMVPN Backup Dedicated Design Model (Layer 2 WAN)

This section includes configuration files corresponding to the WAN remote-site design topologies as referenced in Figure 8. Each remote-site type has its respective devices grouped together along with any other relevant configuration information. The EIGRP Autonomous System Number (ASN) used in Cisco SBA configurations is 300.

Figure 8 - WAN remote-site designs - DMVPN Backup Dedicated (Layer 2 Primary)



Notes

Table 20 - Remote-site WAN connection details - (Layer 2 WAN + DMVPN remote sites)

Location	Net block	(WAN interface) address/mask	VLAN	WAN aggregation router	DMVPN	LAN interfaces	Loopbacks
Remote Site 211 (Dual-router, dual-link)	10.5.152.0/21	(gig0/0.38) 10.4.38.211/24	38	10.4.38.1	(gig0/0) DHCP	(gig0/2) (gig0/2)	10.255.255.211 (router 1) 10.255.253.211 (router 2)
Remote Site 213 (Single-router, dual-link)	10.5.176.0/21	(gig0/0.39) 10.4.39.213/24	39	10.4.39.1	(gig0/1) DHCP	(gig0/2)	10.255.255.213 (router)

The following table lists the policed-rate link speeds for the remote-site QoS traffic shaping policies.

Table 21 - Remote-site policed-rate link speeds

Location	Net block	Layer 2 WAN link speeds	DMVPN link speeds
Remote Site 211	10.5.152.0/21	10 Mbps	5 Mbps
Remote Site 213	10.5.176.0/21	20 Mbps	10 Mbps

Remote Site 211: Dual-Router, Dual-Link (Layer 2 WAN + DMVPN)

Table 22 - Remote Site 211—IP address information

Location	Net block	Data wired subnet	Voice wired subnet	Loopbacks and switches
Remote Site 211	10.5.152.0/21	10.5.156.0/24 (VLAN 64)	10.5.157.0/24 (VLAN 69)	10.255.255.211 (router 1) 10.255.253.211 (router 2) 10.5.156.5 (access switch)

RS211-2921-1

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS211-2921-1
!
boot-start-marker
boot-end-marker
!
!
card type t1 0 0
enable secret 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrsw
!
aaa new-model
!
!
aaa group server tacacs+ TACACS-SERVERS
 server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
!
!
!
!
aaa session-id common
!
clock timezone PST -8 0
clock summer-time PDT recurring
network-clock-participate wic 0
!
no ipv6 cef
ip source-route
ip cef
!
!
!
ip multicast-routing
!
!
ip domain name cisco.local
!
multilink bundle-name authenticated
!
!
!
!
voice-card 0
 dspfarm
 dsp services dspfarm
!
!
!
!
!
license udi pid CISCO2911/K9 sn FTX1418AM08
hw-module pvdm 0/0
!
!
!
username admin password 7 121A540411045D5679
!
redundancy
!
!
!
!
!
ip ssh source-interface Loopback0
ip ssh version 2
```

```
!
track 50 ip sla 100 reachability
!
class-map match-any DATA
 match  dscp af21
class-map match-any BGP-ROUTING
 match protocol bgp
class-map match-any INTERACTIVE-VIDEO
 match  dscp cs4  af41
class-map match-any CRITICAL-DATA
 match  dscp cs3  af31
class-map match-any VOICE
 match  dscp ef
class-map match-any SCAVENGER
 match  dscp cs1  af11
class-map match-any NETWORK-CRITICAL
 match  dscp cs2  cs6
!
!
policy-map WAN
 class VOICE
  priority percent 10
 class INTERACTIVE-VIDEO
  priority percent 23
 class CRITICAL-DATA
  bandwidth percent 15
  random-detect dscp-based
 class DATA
  bandwidth percent 19
  random-detect dscp-based
 class SCAVENGER
  bandwidth percent 5
 class NETWORK-CRITICAL
  bandwidth percent 3
 class class-default
  bandwidth percent 25
  random-detect
```

```
policy-map WAN-INTERFACE-G0/0
 class class-default
  shape average 10000000
  service-policy WAN
!
!
!
!
!
interface Loopback0
 ip address 10.255.255.211 255.255.255.255
 ip pim sparse-mode
!
interface GigabitEthernet0/0
 bandwidth 20000
 no ip address
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/0.38
 encapsulation dot1Q 38
 ip address 10.4.38.211 255.255.255.0
 ip pim sparse-mode
 ip summary-address eigrp 300 10.5.152.0 255.255.248.0
!
interface GigabitEthernet0/1
 no ip address
 shutdown
 duplex auto
 speed auto
!
interface GigabitEthernet0/2
 description RS211-A2960S Gig1/0/24
 no ip address
 duplex auto
```

```
 speed auto
!
interface GigabitEthernet0/2.64
 description Wired Data
 encapsulation dot1Q 64
 ip address 10.5.156.2 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim dr-priority 110
 ip pim sparse-mode
 standby version 2
 standby 1 ip 10.5.156.1
 standby 1 priority 110
 standby 1 preempt
 standby 1 authentication md5 key-string 7 0007421507545A545C
 standby 1 track 50 decrement 10
!
interface GigabitEthernet0/2.69
 encapsulation dot1Q 69
 ip address 10.5.157.2 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim dr-priority 110
 ip pim sparse-mode
 standby version 2
 standby 1 ip 10.5.157.1
 standby 1 priority 110
 standby 1 preempt
 standby 1 authentication md5 key-string 7 04585A150C2E1D1C5A
 standby 1 track 50 decrement 10
!
interface GigabitEthernet0/2.99
 description Transit Net
 encapsulation dot1Q 99
 ip address 10.5.152.1 255.255.255.252
 ip pim sparse-mode
!
!
router eigrp 300
 network 10.4.38.0 0.0.0.255
 network 10.5.0.0 0.0.255.255
 network 10.255.0.0 0.0.255.255
 redistribute eigrp 100 route-map LOOPBACK-ONLY
 passive-interface default
 no passive-interface GigabitEthernet0/0.38
 eigrp router-id 10.255.255.211
 eigrp stub connected summary redistributed
!
!
router eigrp 100
 network 10.4.0.0 0.1.255.255
 network 10.255.0.0 0.0.255.255
 redistribute eigrp 300
 passive-interface default
 no passive-interface GigabitEthernet0/2.99
 eigrp router-id 10.255.255.211
!
ip forward-protocol nd
!
ip pim autorp listener
ip pim register-source Loopback0
no ip http server
ip http authentication aaa
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!
ip tacacs source-interface Loopback0
!
ip access-list standard R2-LOOPBACK
 permit 10.255.253.211
!
ip sla 100
 icmp-echo 10.4.38.1 source-interface GigabitEthernet0/0.38
 threshold 1000
 timeout 1000
 frequency 15
```

```
ip sla schedule 100 life forever start-time now
logging 10.4.48.35
!
!
!
route-map LOOPBACK-ONLY permit 10
 match ip address R2-LOOOPBACK
!
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
tacacs server TACACS-SERVER-1
 address ipv4 10.4.48.15
 key 7 122A0014000E182F2F32
!
!
!
control-plane
!
!
!
!
!
!
gatekeeper
 shutdown
!
!
!
!
line con 0
 logging synchronous
line aux 0
line vty 0 4
 transport preferred none
 transport input ssh
line vty 5 15
 transport preferred none
 transport input ssh
!
scheduler allocate 20000 1000
ntp source Loopback0
ntp server 10.4.48.17
!
end
```

RS211-2921-2

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS211-2921-2
!
boot-start-marker
boot-end-marker
!
!
enable secret 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrsw
!
aaa new-model
!
!
aaa group server tacacs+ TACACS-SERVERS
 server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
!
!
```

```
!
!
aaa session-id common
!
clock timezone PST -8 0
clock summer-time PDT recurring
!
no ipv6 cef
ip source-route
ip cef
!
!
!
ip vrf INET-PUBLIC1
 rd 65512:1
!
!
!
ip domain name cisco.local
!
multilink bundle-name authenticated
!
!
!
!
voice-card 0
!
!
!
!
!
license udi pid CISCO2911/K9 sn FTX1420AJLC
hw-module pvdm 0/0
!
!
!
username admin password 7 141443180F0B7B7977
!
redundancy
!
!
!
!
ip ssh source-interface Loopback0
ip ssh version 2
!
class-map match-any DATA
 match  dscp af21
class-map match-any BGP-ROUTING
 match protocol bgp
class-map match-any INTERACTIVE-VIDEO
 match  dscp cs4  af41
class-map match-any CRITICAL-DATA
 match  dscp cs3  af31
class-map match-any VOICE
 match  dscp ef
class-map match-any SCAVENGER
 match  dscp cs1  af11
class-map match-any NETWORK-CRITICAL
 match  dscp cs2  cs6
 match access-group name ISAKMP
!
!
policy-map WAN
 class VOICE
  priority percent 10
 class INTERACTIVE-VIDEO
  priority percent 23
 class CRITICAL-DATA
  bandwidth percent 15
  random-detect dscp-based
 class DATA
  bandwidth percent 19
  random-detect dscp-based
```

```
 class SCAVENGER
  bandwidth percent 5
 class NETWORK-CRITICAL
  bandwidth percent 3
 class class-default
  bandwidth percent 25
  random-detect
policy-map WAN-INTERFACE-G0/0
 class class-default
  shape average 5000000
  service-policy WAN
!
!
crypto keyring DMVPN-KEYRING1 vrf INET-PUBLIC1
  pre-shared-key address 0.0.0.0 0.0.0.0 key cisco123
!
crypto isakmp policy 10
 encr aes 256
 authentication pre-share
 group 2
crypto isakmp keepalive 30 5
crypto isakmp profile FVRF-ISAKMP-INET-PUBLIC1
   keyring DMVPN-KEYRING1
   match identity address 0.0.0.0 INET-PUBLIC1
!
!
crypto ipsec transform-set AES256/SHA/TRANSPORT esp-aes 256 esp-
sha-hmac
 mode transport
!
crypto ipsec profile DMVPN-PROFILE1
 set transform-set AES256/SHA/TRANSPORT
 set isakmp-profile FVRF-ISAKMP-INET-PUBLIC1
!
!
!
!
!
!
interface Loopback0
 ip address 10.255.253.211 255.255.255.255
 ip pim sparse-mode
!
interface Tunnel10
 bandwidth 5000
 ip address 10.4.34.211 255.255.254.0
 no ip redirects
 ip mtu 1400
 ip pim dr-priority 0
 ip pim nbma-mode
 ip pim sparse-mode
 ip hello-interval eigrp 200 20
 ip hold-time eigrp 200 60
 ip nhrp authentication cisco123
 ip nhrp map 10.4.34.1 172.16.130.1
 ip nhrp map multicast 172.16.130.1
 ip nhrp network-id 101
 ip nhrp holdtime 600
 ip nhrp nhs 10.4.34.1
 ip nhrp registration no-unique
 ip nhrp shortcut
 ip nhrp redirect
 ip tcp adjust-mss 1360
 ip summary-address eigrp 200 10.5.152.0 255.255.248.0
 tunnel source GigabitEthernet0/0
 tunnel mode gre multipoint
 tunnel vrf INET-PUBLIC1
 tunnel protection ipsec profile DMVPN-PROFILE1
!
interface GigabitEthernet0/0
 bandwidth 5000
 ip vrf forwarding INET-PUBLIC1
 ip address dhcp
 ip access-group ACL-INET-PUBLIC in
```

```
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/1
 no ip address
 shutdown
 duplex auto
 speed auto
!
interface GigabitEthernet0/2
 description RS211-A2960S Gig1/0/23
 no ip address
 duplex auto
 speed auto
!
interface GigabitEthernet0/2.64
 description Wired Data
 encapsulation dot1Q 64
 ip address 10.5.156.3 255.255.255.0
 ip helper-address 10.4.48.10
 ip wccp 61 redirect in
 ip pim dr-priority 105
 ip pim sparse-mode
 standby version 2
 standby 1 ip 10.5.156.1
 standby 1 priority 105
 standby 1 preempt
 standby 1 authentication md5 key-string 7 104D580A061843595F
!
interface GigabitEthernet0/2.69
 description Wired Voice
 encapsulation dot1Q 69
 ip address 10.5.157.3 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim dr-priority 105
 ip pim sparse-mode
 standby version 2
 standby 1 ip 10.5.157.1
 standby 1 priority 105
 standby 1 preempt
 standby 1 authentication md5 key-string 7 08221D5D0A16544541
!
interface GigabitEthernet0/2.99
 description Transit Net
 encapsulation dot1Q 99
 ip address 10.5.152.2 255.255.255.252
 ip pim sparse-mode
!
!
router eigrp 200
 network 10.4.34.0 0.0.1.255
 network 10.5.0.0 0.0.255.255
 network 10.255.0.0 0.0.255.255
 redistribute eigrp 100 route-map LOOPBACK-ONLY
 passive-interface default
 no passive-interface Tunnel10
 eigrp router-id 10.255.253.211
 eigrp stub connected summary redistributed
!
!
router eigrp 100
 network 10.4.0.0 0.1.255.255
 network 10.255.0.0 0.0.255.255
 redistribute eigrp 200
 passive-interface default
 no passive-interface GigabitEthernet0/2.99
 eigrp router-id 10.255.253.211
!
ip forward-protocol nd
!
ip pim register-source Loopback0
no ip http server
```

```
ip http authentication aaa
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!
ip tacacs source-interface Loopback0
!
ip access-list standard R1-LOOPBACK
 permit 10.255.255.211
!
ip access-list extended ACL-INET-PUBLIC
 permit udp any any eq non500-isakmp
 permit udp any any eq isakmp
 permit esp any any
 permit udp any any eq bootpc
 permit icmp any any echo
 permit icmp any any echo-reply
 permit icmp any any ttl-exceeded
 permit icmp any any port-unreachable
 permit udp any any gt 1023 ttl eq 1
ip access-list extended ISAKMP
 permit udp any eq isakmp any eq isakmp
!
logging 10.4.48.35
!
!
!
!
route-map LOOPBACK-ONLY permit 10
 match ip address R1-LOOPBACK
!
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
tacacs server TACACS-SERVER-1
 address ipv4 10.4.48.15
 key 7 15210E0F162F3F0F2D2A
!
!
!
control-plane
!
!
mgcp profile default
!
!
!
!
gatekeeper
 shutdown
!
!
!
line con 0
 logging synchronous
line aux 0
line vty 0 4
 transport preferred none
 transport input ssh
line vty 5 15
 transport preferred none
 transport input ssh
!
scheduler allocate 20000 1000
ntp source Loopback0
ntp server 10.4.48.17
!
end
```

Remote Site 213: Single-Router, Dual-Link (Layer 2 WAN + DMVPN)

Table 23 - Remote Site 213—IP address information

Location	Net block	Data wired subnet	Voice wired subnet	Loopbacks and switches
Remote Site 213	10.5.176.0/21	10.5.180.0/24 (VLAN 64)	10.5.181.0/24 (VLAN 69)	10.255.255.213 (router) 10.5.180.5 (access switch)

RS213-2911

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS213-2911
!
boot-start-marker
boot-end-marker
!
!
enable secret 5 $1$EZVQ$SdWFvRIIMCDGtrW515P7b1
!
aaa new-model
!
!
aaa group server tacacs+ TACACS-SERVERS
 server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
!
!
!
!
aaa session-id common
!
clock timezone PST -8 0
clock summer-time PDT recurring
!
no ipv6 cef
!
!
ip source-route
ip auth-proxy max-login-attempts 5
ip admission max-login-attempts 5
ip cef
!
!
!
ip vrf INET-PUBLIC1
 rd 65512:1
!
ip multicast-routing
ip dhcp remember
!
!
no ip domain lookup
ip domain name cisco.local
!
multilink bundle-name authenticated
!
!
!
!
!
voice-card 0
!
!
```

```
!
!
!
!
!
license udi pid CISCO2911/K9 sn FTX1420AJL9
license boot module c2900 technology-package securityk9
hw-module pvdm 0/0
!
!
!
username admin password 7 08221D5D0A16544541
!
redundancy
!
!
!
!
ip ssh source-interface Loopback0
ip ssh version 2
!
class-map match-any DATA
 match  dscp af21
class-map match-any INTERACTIVE-VIDEO
 match  dscp cs4  af41
class-map match-any CRITICAL-DATA
 match  dscp cs3  af31
class-map match-any VOICE
 match  dscp ef
class-map match-any SCAVENGER
 match  dscp cs1  af11
class-map match-any NETWORK-CRITICAL
 match  dscp cs2  cs6
 match access-group name ISAKMP
!
!
policy-map WAN
 class VOICE
  priority percent 10
 class INTERACTIVE-VIDEO
  priority percent 23
 class CRITICAL-DATA
  bandwidth percent 15
  random-detect dscp-based
 class DATA
  bandwidth percent 19
  random-detect dscp-based
 class SCAVENGER
  bandwidth percent 5
 class NETWORK-CRITICAL
  bandwidth percent 3
 class class-default
  bandwidth percent 25
  random-detect
policy-map WAN-INTERFACE-G0/1
 class class-default
  shape average 10000000
  service-policy WAN
policy-map WAN-INTERFACE-G0/0
 class class-default
  shape average 20000000
  service-policy WAN
!
!
crypto keyring DMVPN-KEYRING1 vrf INET-PUBLIC1
  pre-shared-key address 0.0.0.0 0.0.0.0 key cisco123
!
crypto isakmp policy 10
 encr aes 256
 authentication pre-share
 group 2
!
crypto isakmp keepalive 30 5
crypto isakmp profile FVRF-ISAKMP-INET-PUBLIC1
```

```
   keyring DMVPN-KEYRING1
   match identity address 0.0.0.0 INET-PUBLIC1
!
!
crypto ipsec transform-set AES256/SHA/TRANSPORT esp-aes 256 esp-
sha-hmac
 mode transport
!
crypto ipsec profile DMVPN-PROFILE1
 set transform-set AES256/SHA/TRANSPORT
 set isakmp-profile FVRF-ISAKMP-INET-PUBLIC1
!
!
!
!
!
interface Loopback0
 ip address 10.255.255.213 255.255.255.255
 ip pim sparse-mode
!
interface Tunnel10
 bandwidth 10000
 ip address 10.4.34.213 255.255.254.0
 no ip redirects
 ip mtu 1400
 ip pim dr-priority 0
 ip pim nbma-mode
 ip pim sparse-mode
 ip hello-interval eigrp 200 20
 ip hold-time eigrp 200 60
 ip nhrp authentication cisco123
 ip nhrp map multicast 172.16.130.1
 ip nhrp map 10.4.34.1 172.16.130.1
 ip nhrp network-id 101
 ip nhrp holdtime 600
 ip nhrp nhs 10.4.34.1
 ip nhrp registration no-unique
 ip nhrp shortcut
 ip nhrp redirect
 ip tcp adjust-mss 1360
 ip summary-address eigrp 200 10.5.176.0 255.255.248.0
 tunnel source GigabitEthernet0/1
 tunnel mode gre multipoint
 tunnel vrf INET-PUBLIC1
 tunnel protection ipsec profile DMVPN-PROFILE1
!
interface GigabitEthernet0/0
 bandwidth 20000
 no ip address
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/0.39
 encapsulation dot1Q 39
 ip address 10.4.39.213 255.255.255.0
 ip pim sparse-mode
 ip summary-address eigrp 300 10.5.176.0 255.255.248.0
!
interface GigabitEthernet0/1
 description Internet WAN Uplink
 bandwidth 10000
 ip vrf forwarding INET-PUBLIC1
 ip address dhcp
 ip access-group ACL-INET-PUBLIC in
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/1
!
interface GigabitEthernet0/2
 description RS213-3560X Gig0/24
 ip address 10.5.176.129 255.255.255.248
```

```
 duplex auto
 speed auto
!
interface GigabitEthernet0/2.64
 description Wired Data
 encapsulation dot1Q 64
 ip address 10.5.180.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface GigabitEthernet0/2.69
 description Wired Voice
 encapsulation dot1Q 69
 ip address 10.5.181.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
!
router eigrp 300
 network 10.4.39.0 0.0.0.255
 network 10.5.0.0 0.0.255.255
 network 10.255.0.0 0.0.255.255
 passive-interface default
 no passive-interface GigabitEthernet0/0.39
 eigrp router-id 10.255.255.213
 eigrp stub connected summary
!
!
router eigrp 200
 network 10.4.34.0 0.0.1.255
 network 10.5.0.0 0.0.255.255
 network 10.255.0.0 0.0.255.255
 passive-interface default
 no passive-interface Tunnel10
 eigrp router-id 10.255.255.213
 eigrp stub connected summary
!
ip forward-protocol nd
!
ip pim autorp listener
ip pim register-source Loopback0
no ip http server
ip http authentication aaa
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!
ip tacacs source-interface Loopback0
!
!
ip access-list extended ACL-INET-PUBLIC
 permit udp any any eq non500-isakmp
 permit udp any any eq isakmp
 permit esp any any
 permit udp any any eq bootpc
 permit icmp any any echo
 permit icmp any any echo-reply
 permit icmp any any ttl-exceeded
 permit icmp any any port-unreachable
 permit udp any any gt 1023 ttl eq 1
ip access-list extended ISAKMP
 permit udp any eq isakmp any eq isakmp
!
logging 10.4.48.35
!
!
!
!
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
tacacs server TACACS-SERVER-1
 address ipv4 10.4.48.15
 key 7 15210E0F162F3F0F2D2A
```

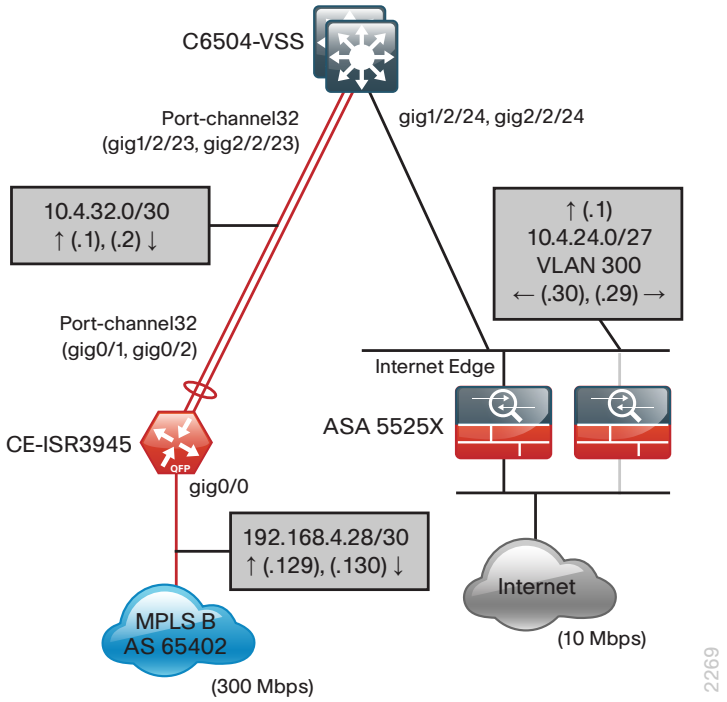
```
!
!
!
control-plane
!
!
!
mgcp profile default
!
!
!
!
!
gatekeeper
 shutdown
!
!
!
line con 0
 logging synchronous
line aux 0
line vty 0 4
 exec-timeout 0 0
 transport preferred none
 transport input ssh
line vty 5 15
 exec-timeout 0 0
 transport preferred none
 transport input ssh
!
scheduler allocate 20000 1000
ntp source Loopback0
ntp server 10.4.48.17
!
end
```

Notes

WAN-Aggregation Devices – DMVPN Backup Shared Design Model

This section includes configuration files corresponding to the DMVPN Backup Shared design model as referenced in Figure 9.

Figure 9 - WAN-aggregation design—DMVPN Backup Shared



The following table provides the loopback addresses for the WAN aggregation devices in the DMVPN Backup Shared design model, shown in the preceding figure.

Table 24 - Loopback addresses

Hostname	Loopback0
C6504-VSS	10.4.15.254/32
CE-ISR3945	10.4.32.254/32

CE-ISR3945

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname CE-ISR3945
!
boot-start-marker
boot-end-marker
!
enable secret 5 $1$65Nt$Q8DJB/6aNGP5lgpo6CCkA.
!
aaa new-model
!
!
!
!
!
!
!
aaa session-id common
!
```

```
!
!
clock timezone PST -8
clock summer-time PDT recurring
!
!
no ipv6 cef
ip source-route
ip cef
!
!
ip multicast-routing
!
!
ip domain name cisco.local
!
multilink bundle-name authenticated
!
!
!
!
!
voice-card 0
!
!
!
!
!
!
license udi pid C3900-SPE150/K9 sn FOC133037KH
!
!
!
username admin password 7 04585A150C2E1D1C5A
!
redundancy
!
!
ip ssh source-interface Loopback0
ip ssh version 2
!
class-map match-any DATA
 match  dscp af21
class-map match-any INTERACTIVE-VIDEO
 match  dscp cs4  af41
class-map match-any CRITICAL-DATA
 match  dscp cs3  af31
class-map match-any VOICE
 match  dscp ef
class-map match-any SCAVENGER
 match  dscp cs1  af11
class-map match-any NETWORK-CRITICAL
 match  dscp cs2  cs6
!
!
policy-map WAN
 class VOICE
  priority percent 10
 class INTERACTIVE-VIDEO
  priority percent 23
 class CRITICAL-DATA
  bandwidth percent 15
  random-detect dscp-based
 class DATA
  bandwidth percent 19
  random-detect dscp-based
 class SCAVENGER
  bandwidth percent 5
 class NETWORK-CRITICAL
  bandwidth percent 3
 class class-default
  bandwidth percent 25
  random-detect
policy-map WAN-INTERFACE-G0/0
```

```
 class class-default
  shape average 300000000
  service-policy WAN
!
crypto keyring DMVPN-KEYRING
  pre-shared-key address 0.0.0.0 0.0.0.0 key cisco123
!
crypto isakmp policy 10
 encr aes 256
 authentication pre-share
 group 2
crypto isakmp profile ISAKMP-PROFILE
   keyring DMVPN-KEYRING
   match identity address 0.0.0.0
!
!
crypto ipsec transform-set AES256/SHA/TRANSPORT esp-aes 256 esp-
sha-hmac
 mode transport
!
crypto ipsec profile DMVPN-PROFILE
 set transform-set AES256/SHA/TRANSPORT
 set isakmp-profile ISAKMP-PROFILE
!
!
!
!
!
!
interface Loopback0
 ip address 10.4.32.254 255.255.255.255
 ip pim sparse-mode
 !
!
interface Tunnel10
 bandwidth 10000
 ip address 10.4.34.1 255.255.255.0
 no ip redirects
 ip mtu 1400
 ip pim nbma-mode
 ip pim sparse-mode
 ip hello-interval eigrp 200 20
 ip hold-time eigrp 200 60
 ip nhrp authentication cisco123
 ip nhrp map multicast dynamic
 ip nhrp network-id 101
 ip nhrp holdtime 600
 ip nhrp redirect
 ip tcp adjust-mss 1360
 no ip split-horizon eigrp 200
 tunnel source Port-channel32
 tunnel mode gre multipoint
 tunnel protection ipsec profile DMVPN-PROFILE
 !
!
interface Port-channel32
 ip address 10.4.32.2 255.255.255.252
 ip pim sparse-mode
 !
 hold-queue 150 in
!
interface GigabitEthernet0/0
 bandwidth 300000
 ip address 192.168.4.129 255.255.255.252
 duplex auto
 speed auto
 no cdp enable
 !
!
interface GigabitEthernet0/1
 description C6504-VSS Gig2/2/23
 no ip address
 duplex auto
 speed auto
```

```
 channel-group 32
 !
!
interface GigabitEthernet0/2
 description C6504-VSS Gig1/2/23
 no ip address
 duplex auto
 speed auto
 channel-group 32
 !
!
!
!
router eigrp 100
 default-metric 300000 300 255 1 1500
 network 10.4.0.0 0.1.255.255
 redistribute static
 redistribute eigrp 200 route-map SET-ROUTE-TAG-DMVPN
 passive-interface default
 no passive-interface Port-channel32
 eigrp router-id 10.4.32.254
!
!
router eigrp 200
 network 10.4.34.0 0.0.0.255
 redistribute eigrp 100
 passive-interface default
 no passive-interface Tunnel10
 eigrp router-id 10.4.32.254
!
ip forward-protocol nd
!
ip pim autorp listener
ip pim register-source Loopback0
no ip http server
ip http secure-server
!
ip route 10.5.0.0 255.255.0.0 192.168.4.130
ip route 10.255.252.101 255.255.255.255 192.168.4.130
ip route 192.168.4.128 255.255.255.224 192.168.4.130
!
!
!
!
!
nls resp-timeout 1
cpd cr-id 1
route-map SET-ROUTE-TAG-DMVPN permit 10
 match interface Tunnel10
 set tag 65512
!
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
!
control-plane
 !
!
!
!
!
!
!
!
!
!
gatekeeper
 shutdown
!
!
line con 0
 logging synchronous
line aux 0
```

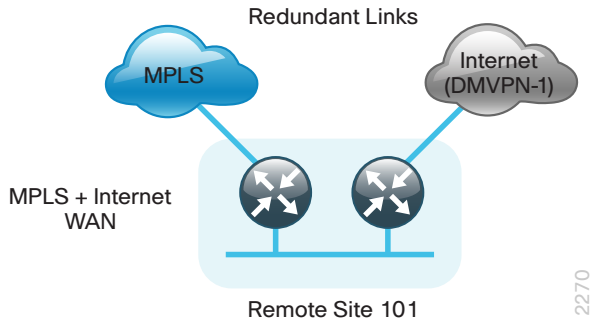
```
line vty 0 4
 transport preferred none
 transport input ssh
line vty 5 15
 transport preferred none
 transport input ssh
!
scheduler allocate 20000 1000
ntp source Loopback0
ntp update-calendar
ntp server 10.4.48.17
end
```

Notes

WAN Remote-Site Devices – DMVPN Backup Shared Design Model

This section includes configuration files corresponding to the DMVPN Backup Shared design model as referenced in Figure 10. Each remote-site type has its respective devices grouped together along with any other relevant configuration information. The Autonomous System Number (ASN) used in Cisco SBA configurations is 65511.

Figure 10 - WAN remote-site designs—DMVPN Backup Shared



Notes

Table 25 - Remote-site WAN connection details

Location	Net block	MPLS CE	MPLS PE	Carrier AS	DMVPN	LAN interfaces	Loopbacks
Remote Site 101 (Single-router, dual-link with local DHCP)	10.5.8.0/21	(gig0/0) 192.168.4.137	192.168.4.138	Statically routed (B)	(gig0/1) DHCP	(gig0/2)	10.255.252.101 (router)

The following table lists the link speeds for the remote-site QoS traffic shaping policies.

Table 26 - Remote-site link speeds

Location	Net block	Layer 3 WAN link speeds	DMVPN link speeds
Remote Site 101	10.5.8.0/21	10 Mbps	5 Mbps

Remote Site 101: Single-Router, Single-Link with Local DHCP (MPLS-B Static)

Table 27 - Remote Site 101—IP address information

Location	Net block	Data wired subnet	Voice wired subnet	Loopbacks and switches
Remote Site 101	10.5.8.0/21	10.5.12.0/24 (VLAN 64)	10.5.13.0/24 (VLAN 69)	10.255.252.101 (router) 10.5.12.5 (access switch)

RS101-2921

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS101-2921
!
boot-start-marker
boot-end-marker
!
!
!
enable secret 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrsw
!
aaa new-model
!
!
!
!
!
!
!
aaa session-id common
!
clock timezone PST -8 0
clock summer-time PDT recurring
!
no ipv6 cef
ip source-route
ip cef
!
!
!
ip vrf INET-PUBLIC1
 rd 65512:1
!
ip multicast-routing
ip dhcp excluded-address 10.5.12.1 10.5.12.19
ip dhcp excluded-address 10.5.13.1 10.5.13.19
!
ip dhcp pool DHCP-Wired-Data
 network 10.5.12.0 255.255.255.0
 default-router 10.5.12.1
 domain-name cisco.local
 dns-server 10.4.48.10
!
ip dhcp pool DHCP-Wired-Voice
 network 10.5.13.0 255.255.255.0
 default-router 10.5.13.1
 domain-name cisco.local
 dns-server 10.4.48.10
!
!
!
ip domain name cisco.local
!
multilink bundle-name authenticated
!
!
!
!
!
voice-card 0
!
!
!
!
!
!
!
!
license udi pid CISCO2921/K9 sn FTX1419ALZK
hw-module pvdm 0/0
!
```

```
!
!
username admin password 7 070C705F4D06485744
!
redundancy
!
!
!
!
ip ssh source-interface Loopback0
ip ssh version 2
!
class-map match-any DATA
 match  dscp af21
class-map match-any BGP-ROUTING
 match protocol bgp
class-map match-any INTERACTIVE-VIDEO
 match  dscp cs4  af41
class-map match-any CRITICAL-DATA
 match  dscp cs3  af31
class-map match-any VOICE
 match  dscp ef
class-map match-any SCAVENGER
 match  dscp cs1  af11
class-map match-any NETWORK-CRITICAL
 match  dscp cs2  cs6
 match access-group name ISAKMP
!
!
policy-map MARK-BGP
 class BGP-ROUTING
  set dscp cs6
policy-map WAN
 class VOICE
  priority percent 10
 class INTERACTIVE-VIDEO
  priority percent 23
 class CRITICAL-DATA
  bandwidth percent 15
  random-detect dscp-based
 class DATA
  bandwidth percent 19
  random-detect dscp-based
 class SCAVENGER
  bandwidth percent 5
 class NETWORK-CRITICAL
  bandwidth percent 3
  service-policy MARK-BGP
 class class-default
  bandwidth percent 25
  random-detect
policy-map WAN-INTERFACE-G0/0
 class class-default
  shape average 10000000
  service-policy WAN
policy-map WAN-INTERFACE-G0/1
 class class-default
  shape average 5000000
  service-policy WAN
!
track 60 ip sla 200 reachability
!
crypto keyring DMVPN-KEYRING1 vrf INET-PUBLIC1
  pre-shared-key address 0.0.0.0 0.0.0.0 key cisco123
!
crypto isakmp policy 10
 encr aes 256
 authentication pre-share
 group 2
crypto isakmp keepalive 30 5
crypto isakmp profile FVRF-ISAKMP-INET-PUBLIC1
   keyring DMVPN-KEYRING1
   match identity address 0.0.0.0 INET-PUBLIC1
!
!
crypto ipsec transform-set AES256/SHA/TRANSPORT esp-aes 256 esp-
```

```
sha-hmac
 mode transport
!
crypto ipsec profile DMVPN-PROFILE1
 set transform-set AES256/SHA/TRANSPORT
 set isakmp-profile FVRF-ISAKMP-INET-PUBLIC1
!
!
!
!
!
interface Loopback0
 ip address 10.255.252.101 255.255.255.255
 ip pim sparse-mode
!
interface Tunnel10
 bandwidth 5000
 ip address 10.4.34.102 255.255.255.0
 no ip redirects
 ip mtu 1400
 ip pim dr-priority 0
 ip pim nbma-mode
 ip pim sparse-mode
 ip hello-interval eigrp 200 20
 ip hold-time eigrp 200 60
 ip nhrp authentication cisco123
 ip nhrp map 10.4.34.1 172.17.30.4
 ip nhrp map multicast 172.17.30.4
 ip nhrp network-id 101
 ip nhrp holdtime 600
 ip nhrp nhs 10.4.34.1
 ip nhrp registration no-unique
 ip nhrp shortcut
 ip nhrp redirect
 ip tcp adjust-mss 1360
 ip summary-address eigrp 200 10.5.8.0 255.255.248.0
 shutdown
 tunnel source GigabitEthernet0/1
 tunnel mode gre multipoint
 tunnel vrf INET-PUBLIC1
 tunnel protection ipsec profile DMVPN-PROFILE1
!
interface Embedded-Service-Engine0/0
 no ip address
 shutdown
!
interface GigabitEthernet0/0
 bandwidth 10000
 ip address 192.168.4.137 255.255.255.252
 duplex auto
 speed auto
 no cdp enable
!
interface GigabitEthernet0/1
 bandwidth 5000
 ip vrf forwarding INET-PUBLIC1
 ip address dhcp
 ip access-group ACL-INET-PUBLIC in
 duplex auto
 speed auto
 no cdp enable
!
interface GigabitEthernet0/2
 description RS101-A3560X Gig0/24
 no ip address
 duplex auto
 speed auto
!
interface GigabitEthernet0/2.64
 description Wired Data
 encapsulation dot1Q 64
 ip address 10.5.12.1 255.255.255.0
 ip pim sparse-mode
!
interface GigabitEthernet0/2.69
 description Wired Voice
```

```
 encapsulation dot1Q 69
 ip address 10.5.13.1 255.255.255.0
 ip pim sparse-mode
!
!
!
router eigrp 200
 network 10.4.34.0 0.0.1.255
 network 10.5.0.0 0.0.255.255
 network 10.255.0.0 0.0.255.255
 passive-interface default
 no passive-interface Tunnel10
 eigrp router-id 10.255.252.101
 eigrp stub connected summary
!
ip forward-protocol nd
!
ip pim autorp listener
ip pim register-source Loopback0
no ip http server
ip http secure-server
!
ip route 0.0.0.0 0.0.0.0 192.168.4.138
!
ip access-list extended ACL-INET-PUBLIC
 permit udp any any eq non500-isakmp
 permit udp any any eq isakmp
 permit esp any any
 permit udp any any eq bootpc
 permit icmp any any echo
 permit icmp any any echo-reply
 permit icmp any any ttl-exceeded
 permit icmp any any port-unreachable
 permit udp any any gt 1023 ttl eq 1
ip access-list extended ISAKMP
 permit udp any eq isakmp any eq isakmp
!
ip sla 200
 icmp-echo 192.168.4.129 source-interface GigabitEthernet0/0
 threshold 1000
 frequency 15
ip sla schedule 200 life forever start-time now
!
!
!
!
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
!
!
!
control-plane
!
!
!
!
mgcp profile default
!
!
!
!
!
gatekeeper
 shutdown
!
!
!
line con 0
 logging synchronous
line aux 0
line vty 0 4
 transport preferred none
```

```
 transport input ssh
line vty 5 15
 transport preferred none
 transport input ssh
!
scheduler allocate 20000 1000
ntp source Loopback0
ntp update-calendar
ntp server 10.4.48.17
event manager applet ACTIVATE-VPN
 event track 60 state down
 action 1  cli command "enable"
 action 2  cli command "configure terminal"
 action 3  cli command "interface tunnel10"
 action 4  cli command "no shutdown"
 action 5  cli command "end"
 action 99 syslog msg "Primary Link Down - Activating VPN
interface"
event manager applet DEACTIVATE-VPN
 event track 60 state up
 action 1  cli command "enable"
 action 2  cli command "configure terminal"
 action 3  cli command "interface tunnel10"
 action 4  cli command "shutdown"
 action 5  cli command "end"
 action 99 syslog msg "Primary Link Restored - Deactivating VPN
interface"
!
end
```

Notes

Feedback

Please use the feedback form to send comments and suggestions about this guide.

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