Newer Cisco SBA Guides Available

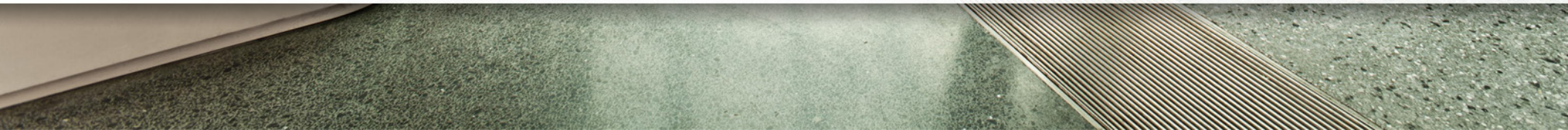
This guide is part of an older series of Cisco Smart Business Architecture designs. To access the latest Cisco SBA Guides, go to http://www.cisco.com/go/sba

Cisco strives to update and enhance SBA guides on a regular basis. As we develop a new 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.

MPLS WAN Configuration Files Guide

SMART BUSINESS ARCHITECTURE

August 2012 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 August 2012 are the "August 2012 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.

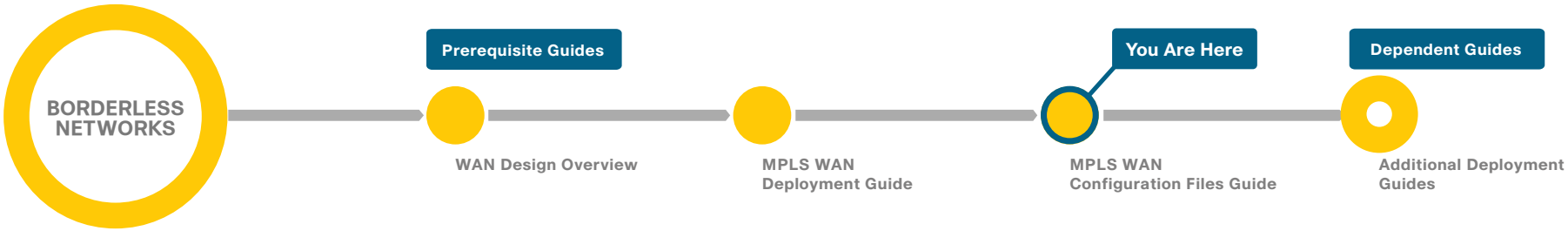
About This Guide

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

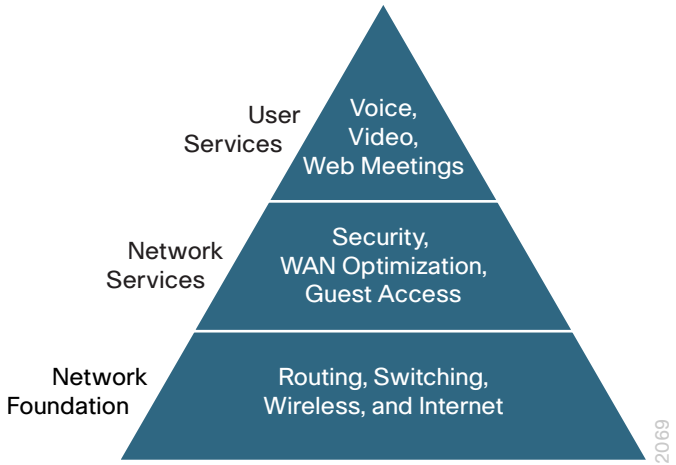
For Cisco partners and customers with up to 10,000 connected users, Cisco has created an "out-of-the-box" deployment that is simple, fast, affordable, scalable, and flexible. It is designed it to be easy to configure, deploy, and manage. The simplicity of this deployment, though, belies the depth and 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 Cisco SBA design and deployment guides; these 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 *MPLS WAN Deployment Guide* has the following sections:

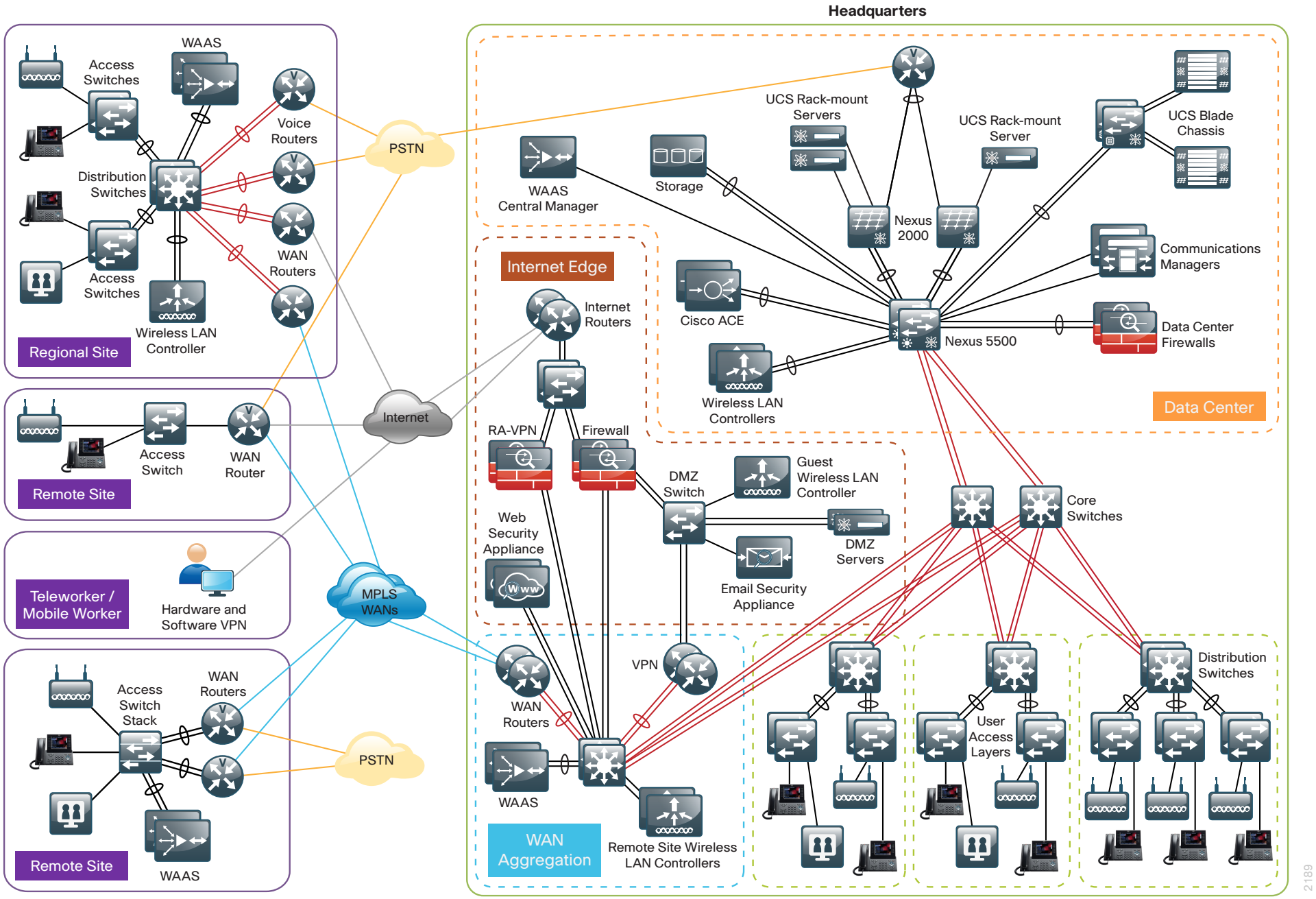
- Deploying an MPLS WAN
- Deploying a WAN Remote-Site Distribution Layer
- Deploying WAN Quality of Service

Using the MPLS WAN Configuration Files Guide

This document provides the available configuration files for the products used in *the MPLS 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 *MPLS WAN Deployment Guide* and the *MPLS WAN Configuration Files Guide* provide the complete list of products used in the lab testing of this design.

Figure 2 - Cisco SBA Overview



Appendix A: 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)S Advanced Enterprise
	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)M4 securityk9, datak9
	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)M4 securityk9, datak9
	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	
Modular WAN Remote-site Router	Cisco 2951 Voice Sec. Bundle, PVDM3-32, UC and SEC License PAK	C2951-VSEC/K9	15.1(4)M4 securityk9, datak9
	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	
Modular WAN Remote-site Router	1941 WAAS Express only Bundle	C1941-WAASX-SEC/K9	15.1(4)M4 securityk9, datak9
	Data Paper PAK for Cisco 1900 series	SL-19-DATA-K9	
Fixed WAN Remote-site Router	Cisco 881 SRST Ethernet Security Router with FXS FXO 802.11n FCC Compliant	C881SRST-K9	15.1(4)M4 securityk9, datak9

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
	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(1)SE2 IP Base
	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	
Standalone Access Layer Switch	Cisco Catalyst 3560-X Series Standalone 48 Ethernet 10/100/1000 PoE+ ports	WS-C3560X-48PF-S	15.0(1)SE2 IP Base
	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(1)SE2 LAN Base
	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
	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	
	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
	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(1)SE2 IP Services
	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 Configuration Files

WAN-Aggregation Devices – Dual MPLS and MPLS Dynamic Design Models

This section includes configuration files corresponding to the Dual MPLS design model as referenced in Figure 3. These configuration files also apply to the MPLS Dynamic design model.

Notes

Figure 3 - WAN-aggregation design—Dual MPLS and MPLS Dynamic design models

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

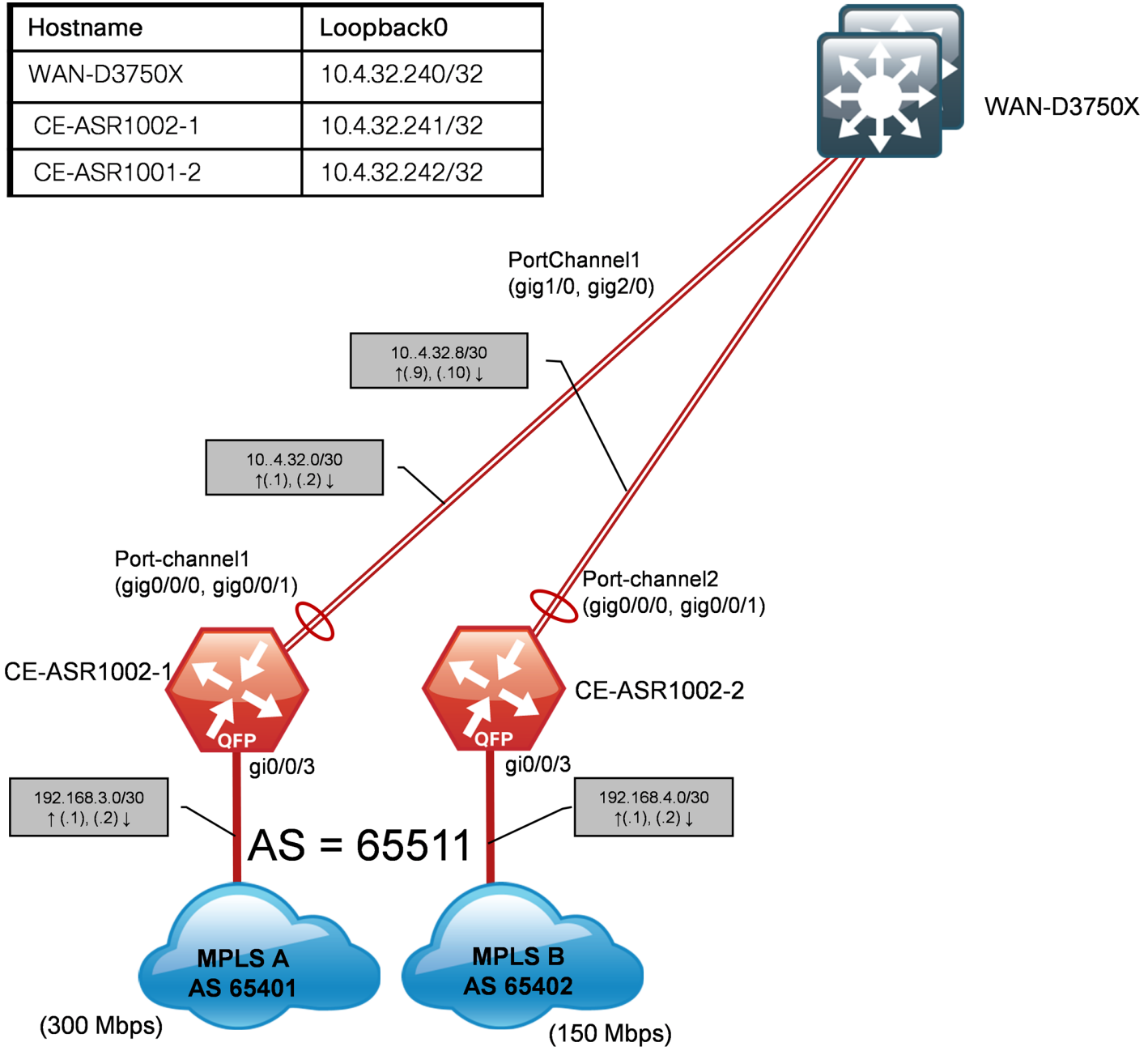


Table 1 provides a summary of the various distribution layer switch device interconnections to other WAN-aggregation components.

Table 1 - Dual MPLS design model—distribution layer switch port channel information

Port-Channel	Member interfaces	Layer3/Layer2	Connected device
1	gig1/0/1 gig2/0/1	Layer 3	CE-ASR1002-1
2	gig1/0/2 gig2/0/2	Layer 3	CE-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
!
!
logging buffered 1000000
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 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 3 100 100 100 400
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 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 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 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
 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 esm config
logging trap errors
logging 10.4.48.35
logging 10.4.48.36
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
```

CE-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 CE-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 domain name cisco.local
ip multicast-routing distributed
!
!
!
!
multilink bundle-name authenticated
!
!
```

```
!
!
!
!
!
!
username admin password 7 0205554808095E731F
!
redundancy
 mode none
!
!
!
!
!
!
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-G0/0/3
 class class-default
  shape average 300000000
   service-policy WAN
!
!
!
!
interface Loopback0
 ip address 10.4.32.241 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel1
 ip address 10.4.32.2 255.255.255.252
 ip pim sparse-mode
 no negotiation auto
!
interface GigabitEthernet0/0/0
```

```
 description WAN-D3750X Gig1/0/1
 no ip address
 negotiation auto
 cdp enable
 channel-group 1 mode active
!
interface GigabitEthernet0/0/1
 description WAN-D3750X Gig2/0/1
 no ip address
 negotiation auto
 channel-group 1 mode active
!
interface GigabitEthernet0/0/2
 no ip address
 shutdown
 negotiation auto
!
interface GigabitEthernet0/0/3
 description MPLS PE router
 bandwidth 300000
 ip address 192.168.3.1 255.255.255.252
 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
 distribute-list route-map BLOCK-TAGGED-ROUTES in
 default-metric 300000 100 255 1 1500
 network 10.4.0.0 0.1.255.255
 redistribute bgp 65511
 passive-interface default
 no passive-interface Port-channel1
 eigrp router-id 10.4.32.241
!
router bgp 65511
 bgp router-id 10.4.32.241
 bgp log-neighbor-changes
 network 0.0.0.0
 network 192.168.3.0 mask 255.255.255.252
 redistribute eigrp 100
 neighbor 10.4.32.242 remote-as 65511
 neighbor 10.4.32.242 update-source Loopback0
 neighbor 10.4.32.242 next-hop-self
 neighbor 192.168.3.2 remote-as 65401
!
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 tacacs source-interface Loopback0
!
logging 10.4.48.35
access-list 55 permit 10.4.48.0 0.0.0.255
!
route-map BLOCK-TAGGED-ROUTES deny 10
 match tag 65401 65402 65512
!
route-map BLOCK-TAGGED-ROUTES permit 20
!
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 01200307490E12242455
!
!
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
```

CE-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 CE-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 domain name cisco.local
ip multicast-routing distributed
!
!
!
!
multilink bundle-name authenticated
!
```

```
!
!
!
!
!
!
!
!
!
!
username admin password 7 094F1F1A1A0A464058
!
redundancy
 mode none
!
!
!
!
!
!
!
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-G0/0/3
 class class-default
  shape average 300000000
   service-policy WAN
!
!
!
!
interface Loopback0
 ip address 10.4.32.242 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel1
 ip address 10.4.32.10 255.255.255.252
```

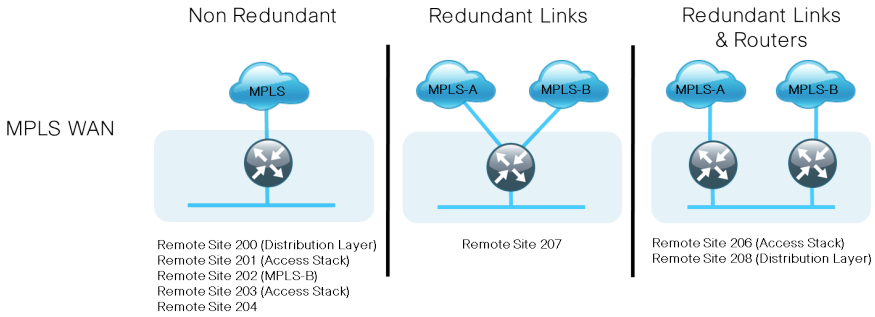
```
 ip pim sparse-mode
 no negotiation auto
!
interface GigabitEthernet0/0/0
 description WAN-D3750X Gig1/0/2
 no ip address
 negotiation auto
 channel-group 1 mode active
!
interface GigabitEthernet0/0/1
 description WAN-D3750X Gig2/0/2
 no ip address
 negotiation auto
 channel-group 1 mode active
!
interface GigabitEthernet0/0/2
 no ip address
 shutdown
 negotiation auto
!
interface GigabitEthernet0/0/3
 description MPLS PE router
 bandwidth 300000
 ip address 192.168.4.1 255.255.255.252
 service-policy output WAN-INTERFACE-G0/0/3
!
interface GigabitEthernet0/2/0
 no ip address
 shutdown
 negotiation auto
!
interface GigabitEthernet0/2/1
 no ip address
 shutdown
 negotiation auto
!
interface GigabitEthernet0/2/2
 no ip address
 shutdown
 negotiation auto
!
interface GigabitEthernet0/2/3
 no ip address
 shutdown
 negotiation auto
!
interface GigabitEthernet0
 vrf forwarding Mgmt-intf
 no ip address
 shutdown
 negotiation auto
!
!
router eigrp 100
 distribute-list route-map BLOCK-TAGGED-ROUTES in
 default-metric 150000 100 255 1 1500
 network 10.4.0.0 0.1.255.255
 redistribute bgp 65511
 redistribute static
 passive-interface default
 no passive-interface Port-channel1
 eigrp router-id 10.4.32.242
!
router bgp 65511
 bgp router-id 10.4.32.242
 bgp log-neighbor-changes
 network 0.0.0.0
 network 192.168.3.0 mask 255.255.255.252
 redistribute eigrp 100
 neighbor 10.4.32.241 remote-as 65511
 neighbor 10.4.32.241 update-source Loopback0
 neighbor 10.4.32.241 next-hop-self
 neighbor 192.168.4.2 remote-as 65402
!
```

```
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 tacacs source-interface Loopback0
!
!
logging 10.4.48.35
access-list 55 permit 10.4.48.0 0.0.0.255
!
route-map BLOCK-TAGGED-ROUTES deny 10
 match tag 65401 65402 65512
!
route-map BLOCK-TAGGED-ROUTES permit 20
!
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 0235015819031B0A4957
!
!
control-plane
!
!
!
line con 0
 logging synchronous
 stopbits 1
line aux 0
 stopbits 1
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
!
ntp source Loopback0
ntp server 10.4.48.17
!
end
```

WAN Remote-Site Devices – Dual MPLS and MPLS Dynamic Design Models

This section includes configuration files corresponding to the Dual MPLS design model as referenced in Figure 4. Each remote-site type has its respective devices grouped together along with any other relevant configuration information.

Figure 4 - WAN remote-site designs—Dual MPLS and MPLS Dynamic



Notes

Table 2 lists the specific details for the MPLS WAN connections at each site.

Table 2 - Remote-site WAN connection details

Remote-Site		**MPLS (Our AS = 65511)**			**LAN interfaces**	**Loopbacks**
Location	Net Block	MPLS CE	MPLS PE	Carrier AS		
Remote site 200 (Single-router, single-link with distribution layer)	10.5.0.0/21	(gi0/0) 192.168.3.17	192.168.3.18	65401 (A)	(gi0/1, gi0/2)	10.255.251.200 (r)
Remote site 201 (Single-router, single-link with access-layer stack)	10.5.40.0/21	(gi0/0) 192.168.3.21	192.168.3.22	65401 (A)	(gi0/1, gi0/2)	10.255.251.201 (r)
Remote site 202 (Single-router, single-link)	10.5.64.0/21	(gi0/0) 192.168.4.5	192.168.4.6	65402 (B)	(gi0/2)	10.255.252.202 (r)
Remote site 203 (Single-router, single-link with access-layer stack)	10.5.48.0/21	(gi0/0) 192.168.3.25	192.168.3.26	65401 (A)	(gi0/1, gi0/2)	10.255.251.203 (r)
Remote site 204 (Single-router, single-link)	10.5.56.0/21	(gi0/0) 192.168.3.29	192.168.3.30	65401 (A)	(gi0/1)	10.255.251.204 (r)
Remote site 206 (Dual-router, dual-link with access-layer stack)	10.5.8.0/21	(gi0/0) 192.168.3.9 (gi0/0) 192.168.4.9	192.168.3.10 192.168.4.10	65401 (A) 65402 (B)	(gi0/1, gi0/2) (gi0/1, gi0/2)	10.255.251.206 (r1) 10.255.252.206 (r2)
Remote site 207 (Single-router, dual-link)	10.5.16.0/21	(gi0/0) 192.168.3.13 (gi0/1) 192.168.4.13	192.168.3.14 192.168.4.14	65401 (A) 65402 (B)	(gi0/2)	10.255.251.207 (r)
Remote site 208 (Dual-router, dual-link with distribution layer)	10.5.80.0/21	(gi0/0) 192.168.3.45 (gi0/0) 192.168.4.45	192.168.3.46 192.168.4.45	65401 (A) 65402 (B)	(gi0/1, gi0/2) (gi0/1, gi0/2)	10.255.251.208 (r1) 10.255.252.208 (r2)

Table 3 lists the link speeds for the remote-site quality-of-service (QoS) traffic shaping policies.

Table 3 - Remote-site link speeds

Remote-Site information		**Link speeds (policed rates)**
Location	Net Block	MPLS
Remote site 200	10.5.0.0/21	50 Mbps
Remote site 201	10.5.40.0/21	10 Mbps
Remote site 202	10.5.64.0/21	10 Mbps
Remote site 203	10.5.48.0/21	20 Mbps
Remote site 204	10.5.56.0/21	2 Mbps
Remote site 206 (dual-link)	10.5.8.0/21	50/25 Mbps
Remote site 207 (dual-link)	10.5.16.0/21	20/10 Mbps
Remote site 208 (dual-link)	10.5.80.0/21	25/25 Mbps

Remote Site 200: Single-Router, Single-Link with Distribution Layer (MPLS-A)

Table 4 shows the IP address information for remote site 200.

Table 4 - Remote site 200—IP address information

Remote-Site information		Wired subnets		Operational IP assignments
Location	Net Block	Data	Voice	Loopbacks and switches
Remote site 200	10.5.0.0/21	10.5.1.0/24 (Vlan100) 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) 10.5.7.254 (distribution switch) 10.5.7.2 (access switch 1) 10.5.7.3 (access switch 2)

Table 5 and Table 6 provide additional information to connect to the distribution layer.

Table 5 - Remote site 200—router connection 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	gi0/1 gi0/2	Port-channel1.50	50	10.5.0.0/30

Table 6 - Remote site 200—distribution layer switch connections

Port-Channel	Member interfaces	Layer3/Layer2	Connected device
1	gi1/0/23 gi2/0/23	Trunk (Vlan50)	RS200-3925-1
10	gi1/0/1 gi2/0/1	Layer 2 (Vlan100,101,106)	RS200-A3750X
11	gi1/0/2	Layer 2 (Vlan102,103,106)	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 25000000
  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-D3750X
 no ip address
 hold-queue 150 in
!
interface Port-channel1.50
 description R1 routed link to distribution layer
 encapsulation dot1Q 50
 ip address 10.5.0.1 255.255.255.252
 ip pim sparse-mode
!
interface Embedded-Service-Engine0/0
 no ip address
 shutdown
!
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-D3750X Gig2/0/23
 no ip address
 duplex auto
 speed auto
 channel-group 1
!
interface GigabitEthernet0/2
 description RS200-D3750X Gig1/0/23
 no ip address
 duplex auto
 speed auto
 channel-group 1
!
interface Vlan1
 no ip address
!
!
router eigrp 100
 default-metric 25000 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
 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 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-D3750X

```
version 15.0
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS200-D3750X
!
boot-start-marker
boot-end-marker
!
!
enable secret 5 $1$x0JT$FtmnsQGSNhDjO.siJKuJg0
!
username admin password 7 130646010803557878
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-24s
switch 2 provision ws-c3750x-24s
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 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 3 100 100 100 400
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 100
 name DataVLAN1
!
vlan 101
 name VoiceVLAN1
!
vlan 102
 name DataVLAN2
!
vlan 103
```

```
 name VoiceVLAN2
!
vlan 999
 name NATIVE
!
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 10.5.7.254 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel1
 description EtherChannel link to RS200-3925-1
 switchport trunk encapsulation dot1q
 switchport trunk allowed vlan 50
 switchport mode trunk
 ip arp inspection trust
 spanning-tree portfast trunk
 ip dhcp snooping trust
!
interface Port-channel10
 description EtherChannel link to RS200-A3750X
 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 RS200-A3750X-PR1
 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 RS200-A3750X Gig2/1/1
 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 RS200-A3750X-PR1 Gig1/1/1
 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 GigabitEthernet1/0/23
 description Link to RS200-3925-1 Gig0/1
 switchport trunk encapsulation dot1q
 switchport trunk allowed vlan 50
 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 GigabitEthernet2/0/1
 description RS200-A3750X Gig1/1/1
 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 GigabitEthernet2/0/2
 description **RS200-A3750X-PR1 Gig1/1/2**
 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 GigabitEthernet2/0/23
 description Link to RS200-3925-1 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 Vlan1
 no ip address
 shutdown
!
interface Vlan50
 ip address 10.5.0.2 255.255.255.252
 ip pim sparse-mode
!
interface Vlan100
 description Wired Data 1
 ip address 10.5.1.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan101
 description Wired Voice 1
 ip address 10.5.2.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan102
 description Wired Data 2
 ip address 10.5.3.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan103
 description Wired Voice 2
 ip address 10.5.4.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan106
 description Management
 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
 network 10.255.0.0 0.0.255.255
 passive-interface default
 no passive-interface Vlan50
 eigrp router-id 10.5.7.254
 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 esm config
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 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
```

Notes

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

Table 7 shows the IP address information for remote site 201.

Table 7 - Remote site 201—IP address information

Remote-Site information		Wired subnets		Operational IP assignments
Location	Net Block	Data (Vlan 64)	Vlan (Vlan 69)	Loopbacks and switches
Remote site 201	10.5.40.0/21	10.5.44.0/24	10.5.45.0/24	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 authentication login MODULE none
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
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
!
!
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
!
!
!
!
interface Loopback0
```

```
 ip address 10.255.251.201 255.255.255.255
 ip pim sparse-mode
!
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 Vlan1
 no ip address
!
!
!
!
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
!
!
```

```
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, Single-Link (MPLS-B)

Table 8 shows the IP address information for remote site 202.

Table 8 - Remote site 202—IP address information

Remote-Site information		Wired subnets		Operational IP assignments
Location	Net Block	Data (Vlan 64)	Vlan (Vlan 69)	Loopbacks and switches
Remote site 202	10.5.64.0/21	10.5.68.0/24	10.5.69.0/24	10.255.252.202 (r) 10.5.68.5 (sw)

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 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
!
!
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
!
!
!
interface Loopback0
 ip address 10.255.252.202 255.255.255.255
 ip pim sparse-mode
!
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 GigabitEthernet0/2
 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 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
!
!
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
```

Notes

Remote Site 203: Single-Router, Single-Link with Access Layer Stack (MPLS-A)

Table 9 shows the IP address information for remote site 203.

Table 9 - Remote site 203—IP address information

Remote-Site information		Wired subnets		Operational IP assignments
Location	Net Block	Data (Vlan 64)	Vlan (Vlan 69)	Loopbacks and switches
Remote site 203	10.5.48.0/21	10.5.52.0/24	10.5.53.0/24	10.255.251.203 (router) 10.5.52.5 (sw)

RS203-2921-1

```
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 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
!
!
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
!
!
!
interface Loopback0
 ip address 10.255.252.202 255.255.255.255
 ip pim sparse-mode
!
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 GigabitEthernet0/2
 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 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
!
!
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
```

Notes

Remote Site 204: Single-Router, Single-Link (MPLS-A)

Table 10 shows the IP address information for remote site 204.

Table 10 - Remote site 204—IP address information

Remote-Site information		Wired subnets		Operational IP assignments
Location	Net Block	Data (Vlan 64)	Vlan (Vlan 69)	Loopbacks and switches
Remote site 204	10.5.56.0/21	10.5.60.0/24	10.5.61.0/24	10.255.251.204 (router) 10.5.60.5 (access-switch)

RS204-1941

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS204-1941
!
boot-start-marker
boot-end-marker
!
!
no logging console
enable secret 5 $1$RrQw$FEwDKjP09Uafh7ycdtSkE0
!
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 multicast-routing
!
!
ip domain name cisco.local
ip name-server 10.4.48.10
!
multilink bundle-name authenticated
!
license udi pid CISCO1941/K9 sn FTX140980GQ
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 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 2000000
  service-policy WAN
!
!
!
!
!
interface Loopback0
 ip address 10.255.251.204 255.255.255.255
 ip pim sparse-mode
!
interface GigabitEthernet0/0
 description Link to MPLS-A
 bandwidth 2000
 ip address 192.168.3.29 255.255.255.252
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/1
 description RS204-A2960S Gig1/0/24
 no ip address
 duplex auto
 speed auto
```

```
!
interface GigabitEthernet0/1.64
 description Wired-Data
 encapsulation dot1Q 64
 ip address 10.5.60.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface GigabitEthernet0/1.69
 description Wired-Voice
 encapsulation dot1Q 69
 ip address 10.5.61.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
router bgp 65511
 bgp router-id 10.255.251.204
 bgp log-neighbor-changes
 network 10.5.60.0 mask 255.255.255.0
 network 10.5.61.0 mask 255.255.255.0
 network 10.255.251.204 mask 255.255.255.255
 network 192.168.3.28 mask 255.255.255.252
 aggregate-address 10.5.56.0 255.255.248.0 summary-only
 neighbor 192.168.3.30 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 responder
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
!
!
line con 0
line aux 0
line 2
 no activation-character
 no exec
 transport preferred none
 transport input all
 transport output pad telnet rlogin lapb-ta mop udptn v120 ssh
 stopbits 1
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 206: Dual-Router, Dual-Link with Access-Layer Stack (MPLS-A/MPLS-B)

Table 11 shows the IP address information for remote site 206.

Table 11 - Remote site 206—IP address information

Remote-Site information		Wired subnets		Operational IP assignments
Location	Net Block	Data (Vlan 64)	Vlan (Vlan 69)	Loopbacks and switches WAE
Remote site 206	10.5.8.0/21	10.5.12.0/24	10.5.13.0/24	10.255.251.206 (router 1) 10.255.252.206 (router 2) 10.5.12.5 (access-switch)

RS206-3925-1

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS206-3925-1
!
boot-start-marker
boot-end-marker
!
!
enable secret 5 $1$E6Pr$6ve4899UvKc3Ep931aMCV/
!
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 CISCO3900-MPE120 sn FHH13030040
license boot module c3900 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 50000000
  service-policy WAN
!
!
!
!
```

```
!
!
interface Loopback0
 ip address 10.255.251.206 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel1
 description EtherChannel Link to RS206-A2960S
 no ip address
 hold-queue 150 in
!
interface Port-channel1.64
 description Wired Data
 encapsulation dot1Q 64
 ip address 10.5.12.2 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim dr-priority 110
 ip pim sparse-mode
 standby version 2
 standby 1 ip 10.5.12.1
 standby 1 priority 110
 standby 1 preempt
 standby 1 authentication md5 key-string 7 110A4816141D5A5E57
 standby 1 track 50 decrement 10
!
interface Port-channel1.69
 description Wired Voice
 encapsulation dot1Q 69
 ip address 10.5.13.2 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim dr-priority 110
 ip pim sparse-mode
 standby version 2
 standby 1 ip 10.5.13.1
 standby 1 priority 110
 standby 1 preempt
 standby 1 authentication md5 key-string 7 130646010803557878
 standby 1 track 50 decrement 10
!
interface Port-channel1.99
 description Transit Network
 encapsulation dot1Q 99
 ip address 10.5.8.1 255.255.255.252
 ip pim sparse-mode
!
interface GigabitEthernet0/0
 bandwidth 50000
 ip address 192.168.3.9 255.255.255.252
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/1
 no ip address
 duplex auto
 speed auto
 channel-group 1
!
interface GigabitEthernet0/2
 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-channel1.99
 eigrp router-id 10.255.251.206
!
router bgp 65511
 bgp router-id 10.255.251.206
 bgp log-neighbor-changes
 network 10.5.12.0 mask 255.255.255.0
 network 10.5.13.0 mask 255.255.255.0
 network 10.255.251.206 mask 255.255.255.255
 network 10.255.252.206 mask 255.255.255.255
 network 192.168.3.8 mask 255.255.255.252
 aggregate-address 10.5.8.0 255.255.248.0 summary-only
 neighbor 10.5.8.2 remote-as 65511
 neighbor 10.5.8.2 next-hop-self
 neighbor 192.168.3.10 remote-as 65401
 neighbor 192.168.3.10 route-map PREFER-MPLS-A in
 neighbor 192.168.3.10 route-map NO-TRANSIT-AS out
!
ip forward-protocol nd
!
ip as-path access-list 1 permit _65401$
ip as-path access-list 10 permit ^$
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 192.168.3.10 source-interface GigabitEthernet0/0
 threshold 1000
 timeout 1000
 frequency 15
ip sla schedule 100 life forever start-time now
logging 10.4.48.35
access-list 55 permit 10.4.48.0 0.0.0.255
!
!
!
!
nls resp-timeout 1
cpd cr-id 1
route-map NO-TRANSIT-AS permit 10
 match as-path 10
!
route-map PREFER-MPLS-A permit 10
 match as-path 1
 set local-preference 200
!
route-map PREFER-MPLS-A permit 20
!
!
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
```

RS206-3925-2

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS206-3925-2
!
boot-start-marker
boot-end-marker
!
!
enable secret 5 $1$fWE4$yQItBXlCdkEFFiUhHQXTe0
!
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 C3900-SPE100/K9 sn FOC134601WE
hw-module sm 1
!
!
!
username admin password 7 121A540411045D5679
!
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-G0/1
 class class-default
  shape average 25000000
  service-policy WAN
!
!
!
!
!
interface Loopback0
 ip address 10.255.252.206 255.255.255.255
 ip pim sparse-mode
!
```

```
interface Port-channel2
 description EtherChannel Link to RS206-A2960S
 no ip address
 hold-queue 150 in
!
interface Port-channel2.64
 description Wired Data
 encapsulation dot1Q 64
 ip address 10.5.12.3 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim dr-priority 105
 ip pim sparse-mode
 standby version 2
 standby 1 ip 10.5.12.1
 standby 1 priority 105
 standby 1 preempt
 standby 1 authentication md5 key-string 7 104D580A061843595F
!
interface Port-channel2.69
 description Wired Voice
 encapsulation dot1Q 69
 ip address 10.5.13.3 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim dr-priority 105
 ip pim sparse-mode
 standby version 2
 standby 1 ip 10.5.13.1
 standby 1 priority 105
 standby 1 preempt
 standby 1 authentication md5 key-string 7 110A4816141D5A5E57
!
interface Port-channel2.99
 description Tansit Network
 encapsulation dot1Q 99
 ip address 10.5.8.2 255.255.255.252
!
interface GigabitEthernet0/0
 bandwidth 25000
 ip address 192.168.4.9 255.255.255.252
 ip pim sparse-mode
 duplex auto
 speed auto
!
interface GigabitEthernet0/1
 no ip address
 duplex auto
 speed auto
 channel-group 2
!
interface GigabitEthernet0/2
 no ip address
 duplex auto
 speed auto
 channel-group 2
!
interface Vlan1
 no ip address
!
!
router eigrp 100
 default-metric 25000 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-channel2.99
 eigrp router-id 10.255.252.206
!
router bgp 65511
 bgp router-id 10.255.252.206
 bgp log-neighbor-changes
 network 10.5.12.0 mask 255.255.255.0
 network 10.5.13.0 mask 255.255.255.0
 network 10.255.251.206 mask 255.255.255.255
```

```
 network 10.255.252.206 mask 255.255.255.255
 network 192.168.4.8 mask 255.255.255.252
 aggregate-address 10.5.8.0 255.255.248.0 summary-only
 neighbor 10.5.8.1 remote-as 65511
 neighbor 10.5.8.1 next-hop-self
 neighbor 192.168.4.10 remote-as 65402
 neighbor 192.168.4.10 route-map NO-TRANSIT-AS out
!
ip forward-protocol nd
!
ip as-path access-list 10 permit ^$
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
access-list 55 permit 10.4.48.0 0.0.0.255
!
!
!
!
nls resp-timeout 1
cpd cr-id 1
route-map NO-TRANSIT-AS permit 10
 match as-path 10
!
!
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 207: Single-Router, Dual-Link (MPLS-A/MPLS-B)

Table 12 shows the IP address information for remote site 207.

Table 12 - Remote site 207—IP address information

Remote-Site information		Wired subnets		Operational IP assignments
Location	Net Block	Data (Vlan 64)	Vlan (Vlan 69)	Loopbacks and switches
Remote site 207	10.5.16.0/21	10.5.20.0/24	10.5.21.0/24	10.255.251.207 (router) 10.5.20.5 (access switch)

RS207-2921

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS207-2921
!
boot-start-marker
boot-end-marker
!
!
enable secret 5 $1$QTJi$3MjRbu2d.MfadRwjWExUr.
!
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 multicast-routing
!
!
ip domain name cisco.local
ip name-server 10.4.48.10
!
multilink bundle-name authenticated
!
!
!
!
!
voice-card 0
```

```
!
!
!
!
!
!
!
license udi pid CISCO2921/K9 sn FHK1345F209
hw-module pvdm 0/0
!
!
!
username admin password 7 104D580A061843595F
!
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-G0/1
 class class-default
  shape average 10000000
  service-policy WAN
policy-map WAN-INTERFACE-G0/0
 class class-default
  shape average 20000000
  service-policy WAN
!
!
!
!
!
!
```

```
interface Loopback0
 ip address 10.255.251.207 255.255.255.255
 ip pim sparse-mode
!
interface GigabitEthernet0/0
 description MPLS A WAN Uplink
 bandwidth 20000
 ip address 192.168.3.13 255.255.255.252
 ip pim sparse-mode
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/1
 description MPLS B WAN Uplink
 bandwidth 10000
 ip address 192.168.4.13 255.255.255.252
 ip pim sparse-mode
 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 10.5.20.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface GigabitEthernet0/2.69
 description Wired Voice
 encapsulation dot1Q 69
 ip address 10.5.21.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
!
router bgp 65511
 bgp router-id 10.255.251.207
 bgp log-neighbor-changes
 network 10.5.20.0 mask 255.255.255.0
 network 10.5.21.0 mask 255.255.255.0
 network 10.255.251.207 mask 255.255.255.255
 network 192.168.3.12 mask 255.255.255.252
 network 192.168.4.12 mask 255.255.255.252
 aggregate-address 10.5.16.0 255.255.248.0 summary-only
 neighbor 192.168.3.14 remote-as 65401
 neighbor 192.168.3.14 route-map PREFER-MPLS-A in
 neighbor 192.168.3.14 route-map NO-TRANSIT-AS out
 neighbor 192.168.4.14 remote-as 65402
 neighbor 192.168.4.14 route-map NO-TRANSIT-AS out
!
ip forward-protocol nd
!
ip as-path access-list 1 permit _65401$
ip as-path access-list 10 permit ^$
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
!
```

```
!
!
!
route-map NO-TRANSIT-AS permit 10
 match as-path 10
!
route-map PREFER-MPLS-A permit 10
 match as-path 1
 set local-preference 200
!
route-map PREFER-MPLS-A permit 20
!
!
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 fax t38 ecm
!
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 208: Dual-router, Dual-Link with Distribution Layer (MPLS-A/MPLS-B)

Table 13 shows the IP address information for remote site 208.

Table 13 - Remote site 208—IP address information

Remote-Site information		Wired subnets		Operational IP assignments
Location	Net Block	Data	Voice	Loopbacks and switches
Remote site 208	10.5.80.0/21	10.5.81.0/24 (Vlan100) 10.5.83.0/24 (Vlan 102)	10.5.82.0/24 (Vlan 101) 10.5.84.0/24 (Vlan 103)	10.255.251.208 (router 1) 10.255.252.208 (router 2) 10.5.87.254 (distribution switch) 10.5.87.2 (access switch 1) 10.5.87.3 (access switch 2) 10.5.87.4 (access switch 3)

Table 14 and Table 15 provide additional information to connect to the distribution layer.

Table 14 - Remote site 208—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 208	10.5.80.0/21	RS208-2951-1	1	gi0/1 gi0/2	Port-channel1.50	50	10.5.80.0/30
					Port-channel1.99 (transit network)	99	10.5.80.8/30
		RS208-2951-2	2	gi0/1 gi0/2	Port-channel2.54	54	10.5.80.4/30
					Port-channel2.99 (transit network)	99	10.5.80.8/30

Table 15 - Remote site 208—distribution layer switch connections

Port-Channel	Member interfaces	Layer3/Layer2	Connected device
1	gi1/0/12 gi2/0/12	Trunk (Vlan50, 99)	RS208-2951-1
2	gi1/0/11 gi2/0/11	Trunk (Vlan54, 99)	RS208-2951-2
10	gi1/0/1 gi2/0/1	Layer 2 (Vlan100,101,106)	RS208-A2960S
11	gi2/0/2	Trunk (Vlan102,103,106)	RS208-A3560X-PR1
12	gi2/0/3	Trunk (Vlan102,103,106)	RS208-A3750X-PR2

RS208-2951-1

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS208-2951-1
!
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 authentication login MODULE none
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 multicast-routing
!
!
ip domain name cisco.local
!
multilink bundle-name authenticated
!
!
!
!
!
voice-card 0
!
!
!
!
!
license udi pid CISCO2951/K9 sn FTX1502AJ0E
hw-module sm 2
!
!
!
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
!
!
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 25000000
  service-policy WAN
!
!
!
!
!
!
interface Loopback0
 ip address 10.255.251.208 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel1
 description EtherChannel link to RS208-D3750X
 no ip address
 hold-queue 150 in
!
interface Port-channel1.50
 description R1 router link to distribution layer
 encapsulation dot1Q 50
 ip address 10.5.80.1 255.255.255.252
 ip pim sparse-mode
!
interface Port-channel1.99
 description Transit Net
 encapsulation dot1Q 99
 ip address 10.5.80.9 255.255.255.252
 ip pim sparse-mode
!
interface Embedded-Service-Engine0/0
 no ip address
 shutdown
!
interface GigabitEthernet0/0
```

```
 bandwidth 25000
 ip address 192.168.3.45 255.255.255.252
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/1
 description RS208-D3750X Gig1/0/12
 no ip address
 duplex auto
 speed auto
 channel-group 1
!
interface GigabitEthernet0/2
 description RS208-D3750X Gig2/0/12
 no ip address
 duplex auto
 speed auto
 channel-group 1
!
interface Vlan1
 no ip address
!
!
router eigrp 100
 default-metric 25000 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 10.255.251.208
!
router bgp 65511
 bgp router-id 10.255.251.208
 bgp log-neighbor-changes
 network 10.5.81.0 mask 255.255.255.0
 network 10.5.83.0 mask 255.255.255.0
 network 10.255.251.208 mask 255.255.255.255
 network 10.255.252.208 mask 255.255.255.255
 network 192.168.3.44 mask 255.255.255.252
 aggregate-address 10.5.80.0 255.255.248.0 summary-only
 neighbor 10.5.80.10 remote-as 65511
 neighbor 10.5.80.10 next-hop-self
 neighbor 192.168.3.46 remote-as 65401
 neighbor 192.168.3.46 route-map PREFER-MPLS-A in
 neighbor 192.168.3.46 route-map NO-TRANSIT-AS out
!
ip forward-protocol nd
!
ip as-path access-list 1 permit _65401$
ip as-path access-list 10 permit ^$
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
route-map NO-TRANSIT-AS permit 10
 match as-path 10
!
route-map PREFER-MPLS-A permit 10
```

```
 match as-path 1
 set local-preference 200
!
route-map PREFER-MPLS-A permit 20
!
!
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 0235015819031B0A4957
!
!
!
control-plane
!
!
!
mgcp profile default
!
!
!
!
!
gatekeeper
 shutdown
!
!
!
line con 0
 logging synchronous
line aux 0
line vty 0 4
 transport preferred none
 transport input all
line vty 5 15
 transport preferred none
 transport input all
!
scheduler allocate 20000 1000
ntp source Loopback0
ntp update-calendar
ntp server 10.4.48.17
!
end
```

RS208-2951-2

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS208-2951-2
!
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 authentication login MODULE none
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 multicast-routing
!
!
ip domain name cisco.local
!
multilink bundle-name authenticated
!
!
!
!
!
voice-card 0
!
!
!
!
!
!
!
license udi pid CISCO2951/K9 sn FHK1425F25D
hw-module pvdm 0/0
!
hw-module sm 2
!
!
!
username admin password 7 110A4816141D5A5E57
!
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 25000000
  service-policy WAN
!
!
!
!
!
interface Loopback0
 ip address 10.255.252.208 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel2
 description EtherChannel link to RS208-D3750X
 no ip address
 hold-queue 150 in
!
interface Port-channel2.54
 description R2 routed link to RS208-D3750X
 encapsulation dot1Q 54
 ip address 10.5.80.5 255.255.255.252
 ip wccp 61 redirect in
 ip pim sparse-mode
!
interface Port-channel2.99
 description Transit net
 encapsulation dot1Q 99
 ip address 10.5.80.10 255.255.255.252
 ip pim sparse-mode
!
interface GigabitEthernet0/0
 bandwidth 25000
 ip address 192.168.4.45 255.255.255.252
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/1
 description RS208-D3750X Gig1/0/11
 no ip address
 duplex auto
 speed auto
 channel-group 2
!
interface GigabitEthernet0/2
 description RS208-D3750X Gig2/0/11
 no ip address
 duplex auto
 speed auto
 channel-group 2
!
interface Vlan1
 no ip address
!
!
router eigrp 100
 default-metric 25000 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-channel2.54
 no passive-interface Port-channel2.99
 eigrp router-id 10.255.252.208
!
router bgp 65511
 bgp router-id 10.255.252.208
 bgp log-neighbor-changes
 network 10.5.81.0 mask 255.255.255.0
 network 10.5.83.0 mask 255.255.255.0
 network 10.255.251.208 mask 255.255.255.255
 network 10.255.252.208 mask 255.255.255.255
 network 192.168.4.44 mask 255.255.255.252
 aggregate-address 10.5.80.0 255.255.248.0 summary-only
 neighbor 10.5.80.9 remote-as 65511
 neighbor 10.5.80.9 next-hop-self
 neighbor 192.168.4.46 remote-as 65402
 neighbor 192.168.4.46 route-map NO-TRANSIT-AS out
!
ip forward-protocol nd
!
ip as-path access-list 10 permit ^$
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
route-map NO-TRANSIT-AS permit 10
 match as-path 10
!
!
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
```

RS208-D3750X

```
version 15.0
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS208-D3750X
!
boot-start-marker
boot-end-marker
!
!
logging buffered 1000000
enable secret 5 $1$MLI2$7NmyX6pKu3eEaqriKTAL7/
!
username admin password 7 0205554808095E731F
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 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 3 100 100 100 400
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 10.5.87.254 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel1
 description EtherChannel link to RS200-2951-1
 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 RS208-2951-2
 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 to RS208-A2960S
 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 RS208-A3560X-PR1
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 999
 switchport trunk allowed vlan 102,103,106
 switchport mode trunk
 logging event link-status
!
interface Port-channel12
 description EtherChannel to RS208-A3750X-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 Link to RS208-A29060S Gig1/0/50
 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 Link to **RS208-A3560X-PR1 Gig1/2**
 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 GigabitEthernet1/0/3
 description RS208-A3750X-PR2 Gig1/1/3
 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 12 mode active
!
interface GigabitEthernet1/0/11
 description Link to RS208-2951-2 Gig0/1
 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 GigabitEthernet1/0/12
 description Link to RS208-2951-1 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 GigabitEthernet2/0/1
 description Link to RS208-A2960S Gig1/0/49
 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 Link to RS208-A3560X-PR1 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 GigabitEthernet2/0/3
 description RS208-A3750X-PR2 Gig1/1/1
 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 12 mode active
!
interface GigabitEthernet2/0/11
 description Link to RS208-2951-2 Gig0/2
 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 GigabitEthernet2/0/12
 description Link to RS208-2951-1 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 Vlan1
 no ip address
 shutdown
!
interface Vlan50
 ip address 10.5.80.2 255.255.255.252
 ip pim sparse-mode
!
interface Vlan54
 ip address 10.5.80.6 255.255.255.252
 ip pim sparse-mode
!
interface Vlan100
 ip address 10.5.81.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan101
 ip address 10.5.82.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan102
 ip address 10.5.83.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan103
 ip address 10.5.84.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan106
 description Management
 ip address 10.5.87.1 255.255.255.128
!
!
router eigrp 100
 network 10.4.0.0 0.1.255.255
 passive-interface default
 no passive-interface Vlan50
 no passive-interface Vlan54
 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 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 073C244F5C0C0D2E120B
```

```
!
!
!
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
```

Notes

WAN-Aggregation Devices—MPLS Static Design Model

This section includes configuration files corresponding to the MPLS Static design model as referenced in Figure 5.

Figure 5 - WAN-aggregation design—MPLS Static

Hostname	Loopback0
C6504-VSS	10.4.15.254/32
CE-ASR1002-1	10.4.32.254/32

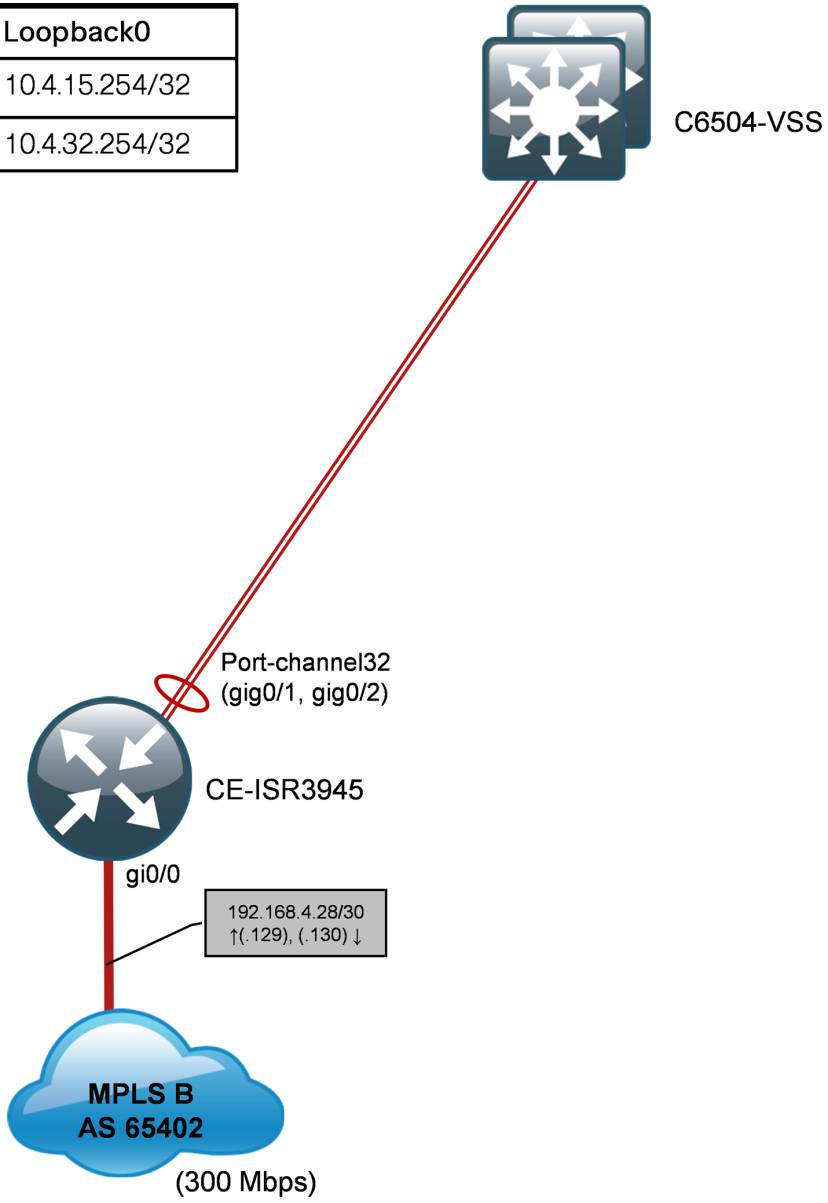


Table 16 provides a summary of the various distribution layer switch device interconnections to other WAN-aggregation components.

Table 16 - MPLS Static design model—distribution layer switch port channel information

Port-Channel	Member interfaces	Layer3/Layer2	Connected device
32	gig1/2/23 gig2/2/23	Layer 3	CE-ISR3945

C6504-VSS

```
version 15.0
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
service counters max age 5
!
hostname C6504-VSS
!
boot-start-marker
boot-end-marker
!
!
enable secret 5 $1$XzOF$hXiNWnTGyT3kN9zKNmGC6.
!
username admin password 7 04585A150C2E1D1C5A
aaa new-model
!
!
aaa authorization console
!
!
!
aaa session-id common
platform ip cef load-sharing ip-only
clock timezone PST -8
clock summer-time PDT recurring
!
!
ip domain-name cisco.local
ip name-server 10.10.48.10
ip multicast-routing
udld enable
!
switch virtual domain 100
 switch mode virtual
 mac-address use-virtual
!
!
table-map cos-discard-class-map
 map from  0 to 0
 map from  1 to 8
 map from  2 to 16
 map from  3 to 24
 map from  4 to 32
 map from  5 to 46
 map from  6 to 48
 map from  7 to 56
!
!
!
macro name EgressQoSTenGig
  service-policy type lan-queuing output 1P7Q4T
@
macro name EgressQoS
  service-policy type lan-queuing output 1P3Q8T
@
!
!
spanning-tree mode rapid-pvst
```

```
spanning-tree portfast edge bpduguard default
spanning-tree extend system-id
!
!
!
!
!
!
diagnostic bootup level minimal
!
redundancy
 main-cpu
  auto-sync running-config
 mode sso
!
vlan internal allocation policy ascending
vlan access-log ratelimit 2000
!
vlan 1128
 name Guest_Wireless
!
ip ssh source-interface Loopback0
ip ssh version 2
!
class-map type lan-queuing match-any MULTIMEDIA-STREAMING-QUEUE
  match  dscp af31  af32  af33
class-map match-any class-copp-icmp-redirect-unreachable
class-map match-all class-copp-glean
class-map type lan-queuing match-any CONTROL-MGMT-QUEUE
  match  dscp cs7
  match  dscp cs6
  match  dscp cs3
  match  dscp cs2
  match cos  3  6  7
class-map type lan-queuing match-any TRANSACTIONAL-DATA-QUEUE
  match  dscp af21  af22  af23
  match cos  2
class-map match-all class-copp-receive
class-map type lan-queuing match-any PRIORITY-QUEUE-GIG
  match cos  4  5
class-map match-all class-copp-options
class-map match-all class-copp-broadcast
class-map match-all class-copp-mcast-acl-bridged
class-map match-all class-copp-slb
class-map type lan-queuing match-any SCAVENGER-QUEUE
  match  dscp cs1
  match cos  1
class-map match-all class-copp-mtu-fail
class-map match-all class-copp-ttl-fail
class-map match-all class-copp-arp-snooping
class-map match-any class-copp-mcast-copy
class-map match-any class-copp-ip-connected
class-map match-any class-copp-match-igmp
  match access-group name acl-copp-match-igmp
class-map match-all class-copp-unknown-protocol
class-map match-any class-copp-vacl-log
class-map match-all class-copp-mcast-ipv6-control
class-map match-any class-copp-match-pimv6-data
  match access-group name acl-copp-match-pimv6-data
class-map match-any class-copp-mcast-punt
class-map match-all class-copp-unsupp-rewrite
class-map match-all class-copp-ucast-egress-acl-bridged
class-map match-all class-copp-ip-admission
class-map type lan-queuing match-any MULTIMEDIA-CONFERENCING-
QUEUE
  match  dscp af41  af42  af43
  match cos  4
class-map match-all class-copp-service-insertion
class-map type lan-queuing match-any BULK-DATA-QUEUE
  match  dscp af11  af12  af13
class-map match-all class-copp-mac-pbf
class-map match-any class-copp-match-mld
  match access-group name acl-copp-match-mld
class-map type lan-queuing match-any BULK-DATA-SCAVENGER
  match cos  1
class-map match-all class-copp-ucast-ingress-acl-bridged
```

```
class-map match-all class-copp-dhcp-snooping
class-map match-all class-copp-wccp
class-map match-all class-copp-nd
class-map match-any class-copp-ipv6-connected
class-map match-all class-copp-mcast-rpf-fail
class-map type lan-queuing match-any PRIORITY-QUEUE
  match  dscp ef
  match  dscp cs5
  match  dscp cs4
  match cos  5
class-map match-any class-copp-ucast-rpf-fail
class-map match-all class-copp-mcast-ip-control
class-map match-any class-copp-match-pim-data
  match access-group name acl-copp-match-pim-data
class-map match-any class-copp-match-ndv6
  match access-group name acl-copp-match-ndv6
class-map type lan-queuing match-any CONTROL-AND-STREAM-MEDIA
  match cos  2  3  6  7
class-map match-any class-copp-mcast-v4-data-on-routedPort
class-map match-any class-copp-mcast-v6-data-on-routedPort
!
!
policy-map type lan-queuing 1P7Q4T
  class PRIORITY-QUEUE
    priority
  class CONTROL-MGMT-QUEUE
    bandwidth remaining percent 14
    queue-buffers ratio 10
    random-detect dscp-based
    random-detect dscp 16 percent 60 70
    random-detect dscp 24 percent 70 80
    random-detect dscp 48 percent 80 90
    random-detect dscp 56 percent 90 100
  class MULTIMEDIA-CONFERENCING-QUEUE
    bandwidth remaining percent 14
    queue-buffers ratio 10
    random-detect dscp-based
    random-detect dscp 34 percent 90 100
    random-detect dscp 36 percent 80 90
    random-detect dscp 38 percent 70 80
  class MULTIMEDIA-STREAMING-QUEUE
    bandwidth remaining percent 14
    queue-buffers ratio 10
    random-detect dscp-based
    random-detect dscp 26 percent 90 100
    random-detect dscp 28 percent 80 90
    random-detect dscp 30 percent 70 80
  class TRANSACTIONAL-DATA-QUEUE
    bandwidth remaining percent 14
    queue-buffers ratio 10
    random-detect dscp-based
    random-detect dscp 18 percent 90 100
    random-detect dscp 20 percent 80 90
    random-detect dscp 22 percent 70 80
  class BULK-DATA-QUEUE
    bandwidth remaining percent 6
    queue-buffers ratio 10
    random-detect dscp-based
    random-detect dscp 10 percent 90 100
    random-detect dscp 12 percent 80 90
    random-detect dscp 14 percent 70 80
  class SCAVENGER-QUEUE
    bandwidth remaining percent 2
    queue-buffers ratio 10
    random-detect dscp-based
    random-detect dscp 8 percent 80 100
  class class-default
    queue-buffers ratio 25
    random-detect dscp-based aggregate
    random-detect dscp values 0 1 2 3 4 5 6 7 percent 80 100
    random-detect dscp values 9 11 13 15 17 19 21 23 percent 80
100
    random-detect dscp values 25 27 29 31 33 35 37 39 percent 80
100
```

```
    random-detect dscp values 41 42 43 44 45 47 49 50 percent 80
100
    random-detect dscp values 51 52 53 54 55 57 58 59 percent 80
100
    random-detect dscp values 60 61 62 63 percent 80 100
policy-map policy-default-autocopp
  class class-copp-mcast-v4-data-on-routedPort
   police rate 10 pps burst 1 packets     conform-action drop
exceed-action drop
  class class-copp-mcast-v6-data-on-routedPort
   police rate 10 pps burst 1 packets     conform-action drop
exceed-action drop
  class class-copp-icmp-redirect-unreachable
   police rate 100 pps burst 10 packets     conform-action
transmit     exceed-action drop
  class class-copp-ucast-rpf-fail
   police rate 100 pps burst 10 packets     conform-action
transmit     exceed-action drop
  class class-copp-vacl-log
   police rate 2000 pps burst 1 packets     conform-action
transmit     exceed-action drop
  class class-copp-mcast-punt
   police rate 1000 pps burst 256 packets     conform-action
transmit     exceed-action drop
  class class-copp-mcast-copy
   police rate 1000 pps burst 256 packets     conform-action
transmit     exceed-action drop
  class class-copp-ip-connected
   police rate 1000 pps burst 256 packets     conform-action
transmit     exceed-action drop
  class class-copp-ipv6-connected
   police rate 1000 pps burst 256 packets     conform-action
transmit     exceed-action drop
  class class-copp-match-pim-data
   police rate 1000 pps burst 1000 packets     conform-action
transmit     exceed-action drop
  class class-copp-match-pimv6-data
   police rate 1000 pps burst 1000 packets     conform-action
transmit     exceed-action drop
  class class-copp-match-mld
   police rate 10000 pps burst 10000 packets     conform-action
set-discard-class-transmit 48     exceed-action transmit
  class class-copp-match-igmp
   police rate 10000 pps burst 10000 packets     conform-action
set-discard-class-transmit 48     exceed-action transmit
  class class-copp-match-ndv6
   police rate 1000 pps burst 1000 packets     conform-action set-
discard-class-transmit 48     exceed-action drop
policy-map type lan-queuing 1P3Q8T
  class PRIORITY-QUEUE-GIG
    priority
    queue-buffers ratio 15
  class CONTROL-AND-STREAM-MEDIA
    bandwidth remaining percent 55
    queue-buffers ratio 40
    random-detect cos-based
    random-detect cos 2 percent 60 70
    random-detect cos 3 percent 70 80
    random-detect cos 6 percent 80 90
    random-detect cos 7 percent 90 100
  class BULK-DATA-SCAVENGER
    bandwidth remaining percent 10
    queue-buffers ratio 20
    random-detect cos-based
    random-detect cos 1 percent 80 100
  class class-default
    queue-buffers ratio 25
    random-detect cos-based
    random-detect cos 0 percent 80 100
!
!
 auto qos default
!
!
```

```
!
interface Loopback0
 ip address 10.10.15.254 255.255.255.255
 ip pim sparse-mode
!
interface Loopback1
 ip address 10.10.15.252 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel32
 description CE-ISR3945
 no switchport
 ip address 10.10.32.1 255.255.255.252
 ip pim sparse-mode
 logging event link-status
 carrier-delay msec 0
!
interface Port-channel101
 no switchport
 no ip address
 no platform qos channel-consistency
 switch virtual link 1
!
interface Port-channel102
 no switchport
 no ip address
 no platform qos channel-consistency
 switch virtual link 2
!
interface TenGigabitEthernet1/1/4
 no switchport
 no ip address
 no cdp enable
 channel-group 101 mode on
!
interface TenGigabitEthernet1/1/5
 no switchport
 no ip address
 no cdp enable
 channel-group 101 mode on
!
interface GigabitEthernet1/2/23
 description CE-ISR3945 Gig0/2
 no switchport
 no ip address
 logging event link-status
 logging event trunk-status
 carrier-delay msec 0
 macro description EgressQoS
 channel-group 32 mode on
 service-policy type lan-queuing output 1P3Q8T
!
interface GigabitEthernet2/2/23
 description CE-ISR3945 Gig0/1
 no switchport
 no ip address
 logging event link-status
 logging event trunk-status
 carrier-delay msec 0
 macro description EgressQoS
 channel-group 32 mode on
 service-policy type lan-queuing output 1P3Q8T
!
interface Vlan1
 no ip address
 shutdown
!
!
router eigrp 100
 network 10.10.0.0 0.1.255.255
 passive-interface default
 no passive-interface Port-channel32
 eigrp router-id 10.10.15.254
 nsf
!
ip forward-protocol nd
```

```
!
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
!
!
ip access-list extended acl-copp-match-igmp
 permit igmp any any
ip access-list extended acl-copp-match-pim-data
 deny   pim any host 224.0.0.13
 permit pim any any
!
access-list 10 permit 239.1.0.0 0.0.255.255
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
tacacs-server host 10.10.48.15 key 7 13361211190910012E3D
no tacacs-server directed-request
!
!
ipv6 access-list acl-copp-match-mld
 permit icmp any any mld-report
 permit icmp any any mld-query
 permit icmp any any mld-reduction
 permit icmp any any 143
!
ipv6 access-list acl-copp-match-ndv6
 permit icmp any any nd-na
 permit icmp any any nd-ns
 permit icmp any any router-advertisement
 permit icmp any any router-solicitation
 permit icmp any any redirect
!
ipv6 access-list acl-copp-match-pimv6-data
 deny 103 any host FF02::D
 permit 103 any any
!
control-plane
 service-policy input policy-default-autocopp
!
!
line con 0
 exec-timeout 0 0
line aux 0
line vty 0 4
 transport preferred none
 transport input ssh
line vty 5 15
 transport preferred none
 transport input ssh
!
ntp clock-period 17180035
ntp source Loopback0
ntp update-calendar
ntp server 10.10.48.17
!
!
module provision switch 1
 slot 1 slot-type 318 port-type 31 number 3 port-type 60 number 2
virtual-slot 17
 slot 2 slot-type 156 port-type 31 number 24  virtual-slot 18
 slot 4 slot-type 284 port-type 60 number 16  virtual-slot 20
 !
module provision switch 2
 slot 1 slot-type 318 port-type 31 number 3 port-type 60 number 2
virtual-slot 33
 slot 2 slot-type 156 port-type 31 number 24  virtual-slot 34
 slot 4 slot-type 284 port-type 60 number 16  virtual-slot 36

!

end
```

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
!
!
!
!
!
!
interface Loopback0
 ip address 10.4.32.254 255.255.255.255
 ip pim sparse-mode
 !
!
```

```
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
 !
!
interface FastEthernet0/0/0
 no ip address
 shutdown
 duplex auto
 speed auto
 !
!
interface FastEthernet0/0/1
 no ip address
 shutdown
 duplex auto
 speed auto
 !
!
!
!
router eigrp 100
 default-metric 300000 300 255 1 1500
 network 10.4.0.0 0.1.255.255
 redistribute static
 passive-interface default
 no passive-interface Port-channel32
 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 10.255.252.2 255.255.255.255 192.168.4.130
ip route 10.255.252.4 255.255.255.255 192.168.4.130
ip route 192.168.4.128 255.255.255.224 192.168.4.130
!
!
!
!
!
nls resp-timeout 1
cpd cr-id 1
!
```

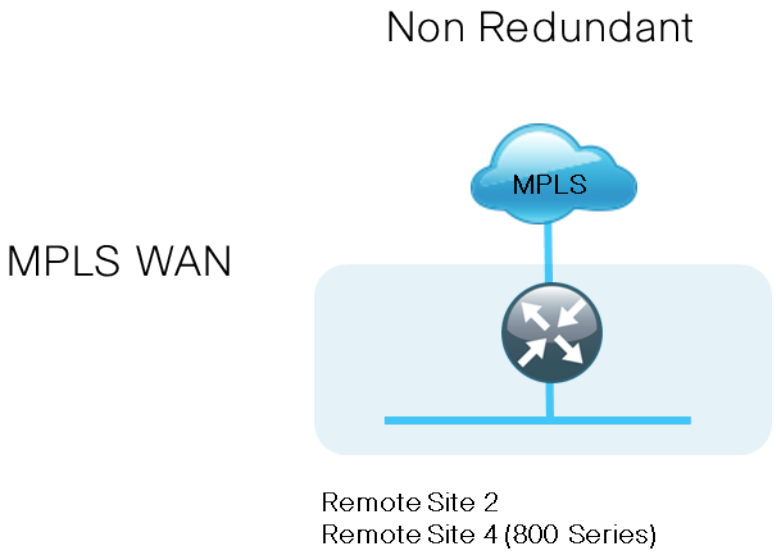
```
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
!
control-plane
 !
!
!
!
!
!
!
!
!
gatekeeper
 shutdown
!
!
line con 0
 logging synchronous
line aux 0
line vty 0 4
 transport preferred none
 transport input ssh
line vty 5 15
 transport preferred 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—MPLS Static Design Model

This section includes configuration files corresponding to the MPLS static design model 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—MPLS Static



Notes

Table 17 lists the specific details for the MPLS WAN and DMVPN WAN connections at each site.

Table 17 - Remote-site WAN connection details

Remote-Site		**MPLS (Our AS = 65511)**				
Location	Net Block	MPLS CE	MPLS PE	Carrier AS	**LAN interfaces**	**Loopbacks**
Remote site 2 (Single-router, single-link with local DHCP)	10.5.8.0/21	(gi0/0) 192.168.4.137	192.168.4.138	Statically routed (B)	(gi0/2)	10.255.252.2 (r)
Remote site 4 (800 Series single-router, single-link with local DHCP)	10.5.24.0/21	(gi0/0) 192.168.4.145	192.168.4.146	Statically routed (B)	(fa0)	10.255.252.4 (r)

Table 18 lists the link speeds for the remote-site QoS traffic shaping policies.

Table 18 - Remote-site link speeds

Remote-Site information		**Link speeds (policed rates)**
Location	Net Block	MPLS
Remote site 2	10.5.8.0/21	10 Mbps
Remote site 4	10.5.24.0/21	2 Mbps

Remote Site 2: Single-Router, Single-Link with Local DHCP (MPLS-B Static)

Table 19 shows the IP address information for remote site 2.

Table 19 - Remote site 2—IP address information

Remote-Site information		**Wired subnets**		**Operational IP assignments**
Location	Net Block	Data (Vlan 64)	Vlan (Vlan 69)	Loopbacks and switches
Remote site 2	10.5.8.0/21	10.5.12.0/24	10.5.13.0/24	10.255.252.2 (router) 10.5.12.5 (access switch)

RS2-2921

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS2-2921
!
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 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
!
!
!
!
!
interface Loopback0
 ip address 10.255.252.2 255.255.255.255
 ip pim sparse-mode
!
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
 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 RS2-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
!
!
!
!
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
!
```

```
!
!
!
!
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
end
```

Remote Site 4: 800 Series Single-Router, Single-Link with Local DHCP (MPLS-B Static)

Table 20 shows the IP address information for remote site 4.

Table 20 - Remote site 4—IP address information

Remote-Site information		Wired subnets		Operational IP assignments
Location	Net Block	Data (Vlan 64)	Vlan (Vlan 69)	Loopbacks and switches
Remote site 4	10.5.24.0/21	10.5.28.0/24	10.5.29.0/24	10.255.252.4 (router) 10.5.28.5 (access switch)

RS4-881

```
version 15.1
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS4-881
!
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
!
ip source-route
!
!
!
ip dhcp excluded-address 10.5.28.1 10.5.28.19
ip dhcp excluded-address 10.5.29.1 10.5.29.19
!
ip dhcp pool DHCP-Wired-Data
 network 10.5.28.0 255.255.255.0
 default-router 10.5.28.1
 domain-name cisco.local
 dns-server 10.4.48.10
!
ip dhcp pool DHCP-Wired-Voice
 network 10.5.29.0 255.255.255.0
 default-router 10.5.29.1
 domain-name cisco.local
 dns-server 10.4.48.10
!
!
ip cef
ip domain name cisco.local
ip multicast-routing
no ipv6 cef
!
```

```
!
!
!
!
multilink bundle-name authenticated
!
!
!
!
!
!
!
voice-card 0
!
license udi pid C881SRSTW-GN-A-K9 sn FTX1542006X
!
!
dot1x system-auth-control
!
spanning-tree portfast bpduguard
spanning-tree vlan 64 priority 8192
spanning-tree vlan 69 priority 8192
username admin password 7 0007421507545A545C
!
!
!
!
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-F4
 class class-default
  shape average 2000000
  service-policy WAN
!
!
!
!
!
!
!
!
```

```
!
interface Loopback0
 ip address 10.255.252.4 255.255.255.255
 ip pim sparse-mode
!
interface FastEthernet0
 switchport trunk native vlan 999
 switchport trunk allowed vlan 1,2,64,69,1002-1005
 switchport mode trunk
 no ip address
!
interface FastEthernet1
 no ip address
!
interface FastEthernet2
 no ip address
!
interface FastEthernet3
 switchport access vlan 64
 switchport voice vlan 69
 no ip address
 spanning-tree portfast
!
interface FastEthernet4
 bandwidth 2000
 ip address 192.168.4.145 255.255.255.252
 duplex auto
 speed auto
 no cdp enable
 service-policy output WAN-INTERFACE-F4
!
interface Vlan1
 no ip address
!
interface Vlan64
 description Wired Data
 ip address 10.5.28.1 255.255.255.0
 ip pim sparse-mode
!
interface Vlan69
 description Wired Voice
 ip address 10.5.29.1 255.255.255.0
 ip pim sparse-mode
!
ip forward-protocol nd
no ip http server
ip http secure-server
!
!
ip pim autorp listener
ip pim register-source Loopback0
ip route 0.0.0.0 0.0.0.0 192.168.4.146
!
!
!
!
!
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
!
!
!
control-plane
!
!
!
!
mgcp profile default
!
!
!
!
```

```
line con 0
 logging synchronous
line aux 0
line vty 0 4
 length 0
 transport preferred none
 transport input ssh
!
ntp source Loopback0
ntp server 10.4.48.17
end
```

Notes

Feedback

Click here to provide feedback to Cisco SBA.

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