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.

LAN Configuration Guide

SMART BUSINESS ARCHITECTURE

February 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 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.

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 2011 are the "August 2011 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 forum at the bottom of one of the following sites:

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

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

An RSS feed is available if you would like to be notified when new comments are posted.

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What's In This SBA Guide

About SBA

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.

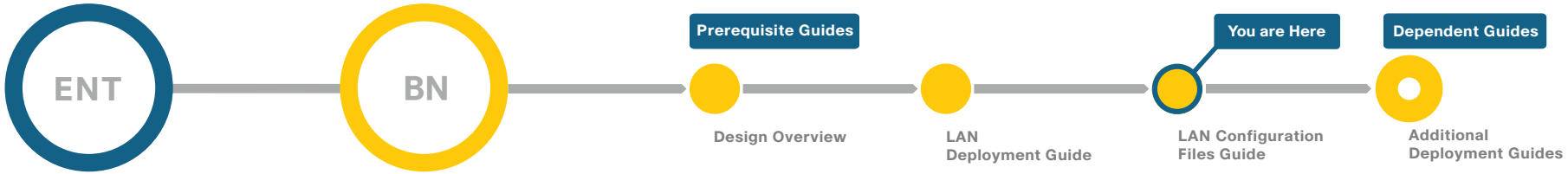
For more information, see the *How to Get Started with Cisco SBA* document:

http://www.cisco.com/en/US/docs/solutions/Enterprise/Borderless_Networks/Smart_Business_Architecture/SBA_Getting_Started.pdf

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.

This guide provides the configuration files for the prerequisite deployment guide, as shown on the Route to Success below.



Route to Success

To ensure your success when implementing the designs in this guide, you should read any guides that this guide depends upon—shown to the left of this guide on the route above. Any guides that depend upon this guide are shown to the right of this guide.

For customer access to all SBA guides: http://www.cisco.com/go/sba
For partner access: http://www.cisco.com/go/sbachannel

Introduction

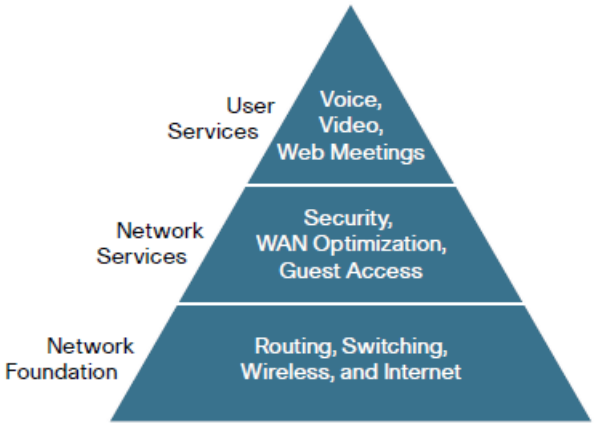
For Cisco partners and customers with 2000–10,000 connected users, we have created an "out-of-the-box" deployment that is simple, fast, affordable, scalable, and flexible. We have designed it to be easy—easy to configure, deploy, and manage.

The simplicity of this deployment, though, belies the depth and breadth of the architecture. Based on feedback from many customers and partners, Cisco has developed a solid network foundation with a flexible platform that does not require re-engineering to support additional Network or User services.

The Smart Business Architecture (SBA) Borderless Networks (BN) for Enterprise Organizations architecture is comprised of a single Design Guide, and Deployment guides and Configuration guides for each of the three sections: LAN, WAN, and Internet Edge.

The SBA BN for Enterprise Organizations Deployment Guide is a prescriptive reference design that provides step-by-step instructions for the deployment of the products in the design. It is based on Enterprise 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.

Figure 1 - Smart Business Architecture Model



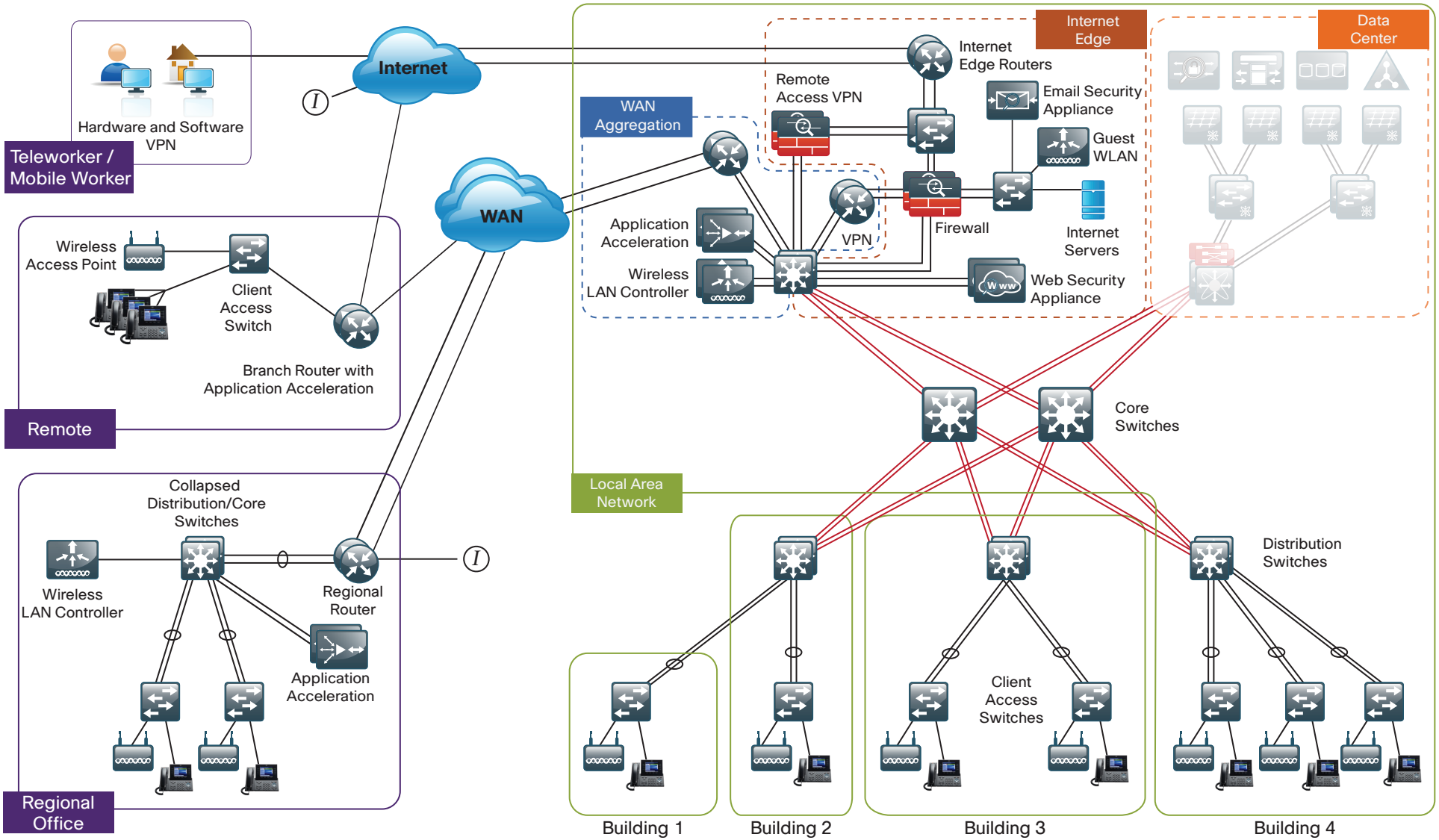
This deployment guide has been architected to make your life a little bit—maybe even a lot—smoother. This architecture:

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

Graphical Interface Management

There are products in this design where we have omitted the configuration file. Those products have browser-based graphical configuration tools. Please refer to the companion Smart Business Architecture Borderless Networks for Enterprise Organizations LAN Deployment Guide at http://www.cisco.com/go/sba for step-by-step instructions on configuring those products.

Figure 2 - Smart Business Architecture Borderless Networks for Enterprise Organizations



Enterprise Organizations Deployment Product List

Functional Area	Product	Part Numbers	Software Version
Access Layer for PC, phones, APs, other devices	Catalyst 2960S Stackable Ethernet 10/100/1000 port with PoE+ and Stack Module	WS-C2960S-24PD-L Catalyst 2960S 24 GigE PoE+, 2 x 10G SFP+ LAN Base WS-C2960S-48FPD-L Catalyst 2960S 48 GigE PoE +, 2 x 10G SFP+ LAN Base WS-C2960S-24PS-L Catalyst 2960S 24 GigE PoE+, 4 x SFP LAN Base WS-C2960S-48FPS-L Catalyst 2960S 48 GigE PoE+, 4 x SFP LAN Base C2960S-STACK= Catalyst 2960S Flexstack Stack Module	15.0(1)SE1
Access Layer for PC, phones, APs, other devices	Catalyst 3560X Ethernet 10/100/1000 ports with PoE+ and Uplink Module	WS-C3560X-24P-S Catalyst 3750 24 10/100/1000T PoE + and IPB Image WS-C3560X-48PF-S Catalyst 3750 48 10/100/1000T Full PoE + and IPB Image C3KX-NM-1G Catalyst 3750X 1Gig SFP Uplink Module C3KX-NM-10G Catalyst 3750X 10Gig SFP+ Uplink Module	15.0(1)SE1
Access Layer for PC, phones, APs, other devices	Catalyst 3750X Stackable Ethernet 10/100/1000 ports with PoE+ and Uplink Module	WS-C3750X-24P-S Catalyst 3750 24 10/100/1000T PoE + and IPB Image WS-C3750X-48PF-S Catalyst 3750 48 10/100/1000T Full PoE + and IPB Image C3KX-NM-1G Catalyst 3750X 1Gig SFP Uplink Module C3KX-NM-10G Catalyst 3750X 10Gig SFP+ Uplink Module	15.0(1)SE1

Access Layer for PC, phones, APs, other devices	Catalyst 4507R+E Dual Supervisors Dual Power Supplies	WS-C4507R+E Catalyst 4500 E-Series 7-Slot Chassis with 48Gbps per Slot WS-X45-SUP7L-E Catalyst 4500 E-Series Sup 7L-E, WS-X4648-RJ45V+E 4500 E-Series 48-Port PoE+ Ready 10/100/1000(RJ45)	15.0(2)XO
Distribution Layer	Catalyst 3750X Stackable 12 Port SFP	WS-C3750X-12S-E Catalyst 3750X 12 SFP + IP Services Image	15.0(1)SE1
Distribution Layer	Catalyst 4507R+E Dual Supervisors Dual Power Supplies	WS-C4507R+E Catalyst 4500 E-Series 7-Slot Chassis with 48Gbps per Slot WS-X45-SUP7-E Catalyst 4500 E-Series Supervisor, 848Gbps WS-X4624-SFP-E Catalyst 4500 E-Series 24-Port GE (SFP) WS-X4712-SFP+E Catalyst 4500 E-Series 12-Port 10GbE (SFP+)	IOS XE 3.1.1 15.0(2)SG1
Distribution Layer	Catalyst 6500 VSS 4T	WS-C6506-E Catalyst 6500 E-Series 6-Slot Chassis VS-S2T-10G Catalyst 6500 VSS Supervisor 2T with 2 ports 10GbE WS-X6724-SFP Catalyst 6500 24-port GigE Mod (SFP) WS-X6816-10G-2T Catalyst 6500 16 port 10 Gigabit Ethernet w/ DFC4	15.0(1)SY with the IP Services Feature Set
Core Layer	Catalyst 6500	WS-C6506-E Catalyst 6500 E-Series 6-Slot Chassis VS-S2T-10G Catalyst 6500 VSS Supervisor 2T with 2 ports 10GbE WS-X6724-SFP Catalyst 6500 24-port GigE Mod (SFP) WS-X6908-10G-2T Catalyst 6500 8 port 10 Gigabit Ethernet w/ DFC4	15.0(1)SY with the IP Services Feature Set
Wireless LAN	2504 Wireless LAN Controller	AIR-CT2504-5-K9 2504 Wireless LAN Controller with 5 AP license	7.1.91.0

Wireless LAN	5508 Wireless LAN Controller	AIR-CT5508-100-K9 5508 Wireless LAN Controller with 100 AP license	7.1.91.0
Wireless LAN	Flex 7500 Wireless LAN Controller	AIR-CT7510-1K-K9 7500 Wireless LAN Controller with 1000 AP license	7.1.91.0
Wireless LAN	1142 Wireless AP	AIR-LAP1142N-A-K9 802.11a/g/n Fixed Unified AP	7.1.91.0
Wireless LAN	1262 Wireless AP	AIR-LAP1262N-A-K9 802.11a/g/n Unified AP with External Antenna	7.1.91.0

Access Layer Configurations

Catalyst 2960-S Series Switch

The Cisco Catalyst 2960-S Series are fixed-configuration, stackable, 10/10/1000 Ethernet switches, with PoE+ and non-powered versions designed for entry-level enterprise, midmarket, and remote site networks.

```
version 15.0
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname A2960S
!
boot-start-marker
boot-end-marker
!
enable secret 5 ********
!
username admin password 7 ********
!
macro name AccessEdgeQoS
auto qos voip cisco-phone
@
macro name EgressQoS
mls qos trust dscp
queue-set 2
srr-queue bandwidth share 1 30 35 5
priority-queue out
@
!
aaa new-model
!
!
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
clock summer-time PDT recurring
switch 1 provision ws-c2960s-24pd-l
switch 2 provision ws-c2960s-24pd-l
switch 3 provision ws-c2960s-24pd-l
stack-mac persistent timer 0
!
!
ip dhcp snooping vlan 180-181
no ip dhcp snooping information option
ip dhcp snooping
ip domain-name cisco.local
ip arp inspection vlan 180-181
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 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
!
crypto pki trustpoint TP-self-signed-372592256
 enrollment selfsigned
 subject-name cn=IOS-Self-Signed-Certificate-372592256
 revocation-check none
 rsakeypair TP-self-signed-372592256
!
!
crypto pki certificate chain TP-self-signed-372592256
 certificate self-signed 01
 30820248 308201B1 A0030201 02020101 300D0609 2A864886 F70D0101
04050030
 30312E30 2C060355 04031325 494F532D 53656C66 2D536967 6E65642D
43657274
 69666963 6174652D 33373235 39323235 36301E17 0D393330 33303130
30343532
 345A170D 32303031 30313030 30303030 5A303031 2E302C06 03550403
1325494F
 532D5365 6C662D53 69676E65 642D4365 72746966 69636174 652D3337
32353932
 32353630 819F300D 06092A86 4886F70D 01010105 0003818D 00308189
02818100
 BF1A01E6 8C5DBCCE E3E1D85C BB921503 3E2CE761 29B873EB 25A55B0A
9DFB29D4
 67BA735E A64398D8 A5E59D35 8CF051EA F3BBCC5D 659B883D A06CF786
8843DE6A
 68C96A48 39AB0826 04BD104E FF1B1C70 37890390 FDEA7CF9 4136AB80
1CCF6A6F
 48C96C73 1A927D96 DBADD206 420F44DF 39FDAFCE D503512F CACC0D31
A0CAD917
 02030100 01A37230 70300F06 03551D13 0101FF04 05300301 01FF301D
0603551D
 11041630 14821241 32393630 532E6369 73636F2E 6C6F6361 6C301F06
03551D23
 04183016 8014E0A7 1ECA8938 639F294F 0F094E63 E775380F 6939301D
0603551D
 0E041604 14E0A71E CA893863 9F294F0F 094E63E7 75380F69 39300D06
092A8648
 86F70D01 01040500 03818100 95648ED1 DFA54AB6 C756566E 1123A74F
D09FA42F
 C771000E 8F83C9BE E9EC9F53 AE36AF17 5D7E3712 D86EBFAD F3E0E4A7
BC1503EA
 7359B926 834A6DC7 1CA229B2 8F65C515 A4BB5F34 038ACE36 F2A6AC8A
CB0B7399
 9B98C79D 13EA084E FBDC59AF 6BEABDC7 677A036D 47A7BFD5 4087DF0E
D7E62A3B
 70EB1B1E A185D8E6 E8BF2CC9
 quit
!
spanning-tree mode rapid-pvst
spanning-tree portfast bpduguard default
spanning-tree extend system-id
```

```
auto qos srnd4
!
!
!
port-channel load-balance src-dst-ip
!
vlan internal allocation policy ascending
!
vlan 180
 name A2960Sdata
!
vlan 181
 name A2960Svoice
!
 vlan 195
 name MgmtVLAN
!
vlan 999
 name antiVLANhopping
!
ip ssh version 2
!
class-map match-all AUTOQOS_VOIP_DATA_CLASS
 match ip dscp ef
class-map match-all AUTOQOS_DEFAULT_CLASS
 match access-group name AUTOQOS-ACL-DEFAULT
class-map match-all AUTOQOS_VOIP_SIGNAL_CLASS
 match ip dscp cs3
!
!
policy-map AUTOQOS-SRND4-CISCOPHONE-POLICY
 class AUTOQOS_VOIP_DATA_CLASS
 set dscp ef
 police 128000 8000 exceed-action policed-dscp-transmit
 class AUTOQOS_VOIP_SIGNAL_CLASS
 set dscp cs3
 police 32000 8000 exceed-action policed-dscp-transmit
 class AUTOQOS_DEFAULT_CLASS
 set dscp default
 police 10000000 8000 exceed-action policed-dscp-transmit
!
!
!
interface Port-channel1
 description D3750X Po 1
 switchport trunk native vlan 999
 switchport trunk allowed vlan 180,181,195
 switchport mode trunk
 ip arp inspection trust
 logging event trunk-status
 logging event bundle-status
 ip dhcp snooping trust
!
interface FastEthernet0
 no ip address
 shutdown
!
interface GigabitEthernet1/0/1
 switchport access vlan 180
 switchport mode access
 switchport voice vlan 181
 switchport port-security maximum 11
 switchport port-security
 switchport port-security aging time 2
 switchport port-security violation restrict
 switchport port-security aging type inactivity
 ip arp inspection limit rate 100
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust device cisco-phone
 mls qos trust cos
 macro description AccessEdgeQoS
 auto qos voip cisco-phone
```

```
 spanning-tree portfast
 service-policy input AUTOQOS-SRND4-CISCOPHONE-POLICY
 ip verify source
 ip dhcp snooping limit rate 100
!
interface GigabitEthernet1/0/2
 switchport access vlan 180
 switchport mode access
 switchport voice vlan 181
 switchport port-security maximum 11
 switchport port-security
 switchport port-security aging time 2
 switchport port-security violation restrict
 switchport port-security aging type inactivity
 ip arp inspection limit rate 100
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust device cisco-phone
 mls qos trust cos
 macro description AccessEdgeQoS
 auto qos voip cisco-phone
 spanning-tree portfast
 service-policy input AUTOQOS-SRND4-CISCOPHONE-POLICY
 ip verify source
 ip dhcp snooping limit rate 100
!
! ************************************************************
*******
! Interface GigabitEthernet 1/0/3 - 3/0/24 are all configured the
same
!  as 1/0/1 and 1/0/2 and have been removed for conciseness
! ************************************************************
*******
!
interface GigabitEthernet1/0/25
 description D3750X Gig 3/0/1
 switchport trunk native vlan 999
 switchport trunk allowed vlan 180,181,195
 switchport mode trunk
 ip arp inspection trust
 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 1 mode active
 ip dhcp snooping trust
!
interface GigabitEthernet2/0/24
 description *** Wireless AP ***
 switchport access vlan 180
 switchport mode access
 switchport voice vlan 181
 switchport port-security maximum 11
 switchport port-security
 switchport port-security aging time 2
 switchport port-security violation restrict
 switchport port-security aging type inactivity
 ip arp inspection limit rate 100
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description EgressQoS
 auto qos trust dscp
 spanning-tree portfast
 ip verify source
 ip dhcp snooping limit rate 100
!
interface GigabitEthernet3/0/25
```

```
 description D3750X Gig 1/0/1
 switchport trunk native vlan 999
 switchport trunk allowed vlan 180,181,195
 switchport mode trunk
 ip arp inspection trust
 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 1 mode active
 ip dhcp snooping trust
!
interface GigabitEthernet3/0/26
!
interface TenGigabitEthernet3/0/1
!
interface TenGigabitEthernet3/0/2
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan195
 description In-band management
 ip address 10.4.95.2 255.255.255.0
!
ip default-gateway 10.4.95.1
no ip http server
ip http authentication aaa
ip http secure-server
!
ip access-list extended AUTOQOS-ACL-DEFAULT
 permit ip any any
ip sla enable reaction-alerts
snmp-server community ******** RO
snmp-server community ******** RW
tacacs-server host 10.4.48.15 key 7 142417081E013E002131
tacacs-server directed-request
!
line con 0
line vty 0 4
 exec-timeout 0 0
 transport input ssh
line vty 5 15
 exec-timeout 0 0
 transport input ssh
!
ntp clock-period 22519093
ntp server 10.4.48.17
end
```

Catalyst 3750-X Series Switch

The Cisco Catalyst 3750-X Series are fixed-port, stackable, 10/100/1000 Ethernet switches, with PoE+ and non-powered versions, that provide enhanced resiliency through the StackWise Plus and StackPower technologies.

```
version 15.0
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname A3750X
!
boot-start-marker
boot-end-marker
!
enable secret 5 ********
!
username admin password 7 ********
!
macro name AccessEdgeQoS
auto qos voip cisco-phone
@
macro name EgressQoS
mls qos trust dscp
queue-set 2
srr-queue bandwidth share 1 30 35 5
priority-queue out
@
!
aaa new-model
!
!
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
clock summer-time PDT recurring
switch 1 provision ws-c3750x-48p
switch 2 provision ws-c3750x-48p
switch 3 provision ws-c3750x-48p
stack-mac persistent timer 0
system mtu routing 1500
!
!
ip dhcp snooping vlan 164-165
no ip dhcp snooping information option
ip dhcp snooping
ip domain-name cisco.local
ip arp inspection vlan 164-165
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
!
crypto pki trustpoint TP-self-signed-4072213248
 enrollment selfsigned
 subject-name cn=IOS-Self-Signed-Certificate-4072213248
 revocation-check none
 rsakeypair TP-self-signed-4072213248
!
!
crypto pki certificate chain TP-self-signed-4072213248
 certificate self-signed 01
 3082024A 308201B3 A0030201 02020101 300D0609 2A864886 F70D0101
04050030
 31312F30 2D060355 04031326 494F532D 53656C66 2D536967 6E65642D
43657274
 69666963 6174652D 34303732 32313332 3438301E 170D3933 30333031
30303037
 33365A17 0D323030 31303130 30303030 305A3031 312F302D 06035504
03132649
 4F532D53 656C662D 5369676E 65642D43 65727469 66696361 74652D34
30373232
 31333234 3830819F 300D0609 2A864886 F70D0101 01050003 818D0030
81890281
 8100D6EC F5DB7573 2D98B279 7C4047AF 9D631ECB 7096A132 A4603C68
28D9893F
 1B90419B 267D9EC4 D1BA9A3C 41BE0A74 DCDF7207 01BFFAB8 33FB00D3
00F5DEAF
 82589E01 22BF2E6B A97F91BF 9FD9B39E D9C9069D 84E29532 4E193000
A800722E
 AEB0B9DA DD77ACEB DF98B1DC 118C6155 5F6BFF09 04847788 393DF5F9
059D95D0
 FE370203 010001A3 72307030 0F060355 1D130101 FF040530 030101FF
301D0603
 551D1104 16301482 12413337 3530582E 63697363 6F2E6C6F 63616C30
1F060355
 1D230418 30168014 A198768C 04CC2229 AF54DBB7 22B6E8F3 857837EB
301D0603
 551D0E04 160414A1 98768C04 CC2229AF 54DBB722 B6E8F385 7837EB30
0D06092A
 864886F7 0D010104 05000381 8100CB23 DB828A04 484F242E FCACD8FD
1F5FC3C0
 D2E448FE 8E3FBF55 C6E0A548 722117A5 A086C848 FC4F5C6D 835ADE12
C8B81689
 4AAC9FBD 74118ACB B48DA9ED 6EF504D7 FC74A91B DC5EF173 82F0F81D
01D864E8
 D7C1D244 2CB3173E F8E86672 1EA57884 F7B75C80 67B63B8C D14BC338
```

```
9938FA70
 51096010 9B55435A 40E01697 6169
 quit
!
spanning-tree mode rapid-pvst
spanning-tree portfast bpduguard default
spanning-tree extend system-id
auto qos srnd4
!
!
!
port-channel load-balance src-dst-ip
!
vlan internal allocation policy ascending
!
vlan 164
 name A3750Xdata
!
vlan 165
 name A3750Xvoice
!
vlan 179
 name MgmtVLAN
!
vlan 999
 name antiVLANhopping
!
ip ssh version 2
!
class-map match-all AUTOQOS_VOIP_DATA_CLASS
 match ip dscp ef
class-map match-all AUTOQOS_DEFAULT_CLASS
 match access-group name AUTOQOS-ACL-DEFAULT
class-map match-all AUTOQOS_VOIP_SIGNAL_CLASS
 match ip dscp cs3
!
!
policy-map AUTOQOS-SRND4-CISCOPHONE-POLICY
 class AUTOQOS_VOIP_DATA_CLASS
 set dscp ef
 police 128000 8000 exceed-action policed-dscp-transmit
 class AUTOQOS_VOIP_SIGNAL_CLASS
 set dscp cs3
 police 32000 8000 exceed-action policed-dscp-transmit
 class AUTOQOS_DEFAULT_CLASS
 set dscp default
 police 10000000 8000 exceed-action policed-dscp-transmit
!
!
!
interface Port-channel1
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 999
 switchport trunk allowed vlan 164,165,179
 switchport mode trunk
 ip arp inspection trust
 logging event trunk-status
 logging event bundle-status
 ip dhcp snooping trust
!
interface FastEthernet0
 no ip address
!
interface GigabitEthernet1/0/1
 switchport access vlan 164
 switchport mode access
 switchport voice vlan 165
 switchport port-security maximum 11
 switchport port-security
 switchport port-security aging time 2
 switchport port-security violation restrict
 switchport port-security aging type inactivity
 ip arp inspection limit rate 100
 srr-queue bandwidth share 1 30 35 5
```

```
 queue-set 2
 priority-queue out
 mls qos trust device cisco-phone
 mls qos trust cos
 macro description AccessEdgeQoS
 auto qos voip cisco-phone
 spanning-tree portfast
 service-policy input AUTOQOS-SRND4-CISCOPHONE-POLICY
 ip verify source
 ip dhcp snooping limit rate 100
!
interface GigabitEthernet1/0/2
 switchport access vlan 164
 switchport mode access
 switchport voice vlan 165
 switchport port-security maximum 11
 switchport port-security
 switchport port-security aging time 2
 switchport port-security violation restrict
 switchport port-security aging type inactivity
 ip arp inspection limit rate 100
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust device cisco-phone
 mls qos trust cos
 macro description AccessEdgeQoS
 auto qos voip cisco-phone
 spanning-tree portfast
 service-policy input AUTOQOS-SRND4-CISCOPHONE-POLICY
 ip verify source
 ip dhcp snooping limit rate 100
!
! ************************************************************
*******
! Interface GigabitEthernet 1/0/3 - 2/0/48 are all configured the
same
! as 1/0/1 and 1/0/2 and have been removed for conciseness
! ************************************************************
*******
!
interface GigabitEthernet1/1/1
!
interface GigabitEthernet1/1/2
!
interface GigabitEthernet1/1/3
!
interface GigabitEthernet1/1/4
!
interface TenGigabitEthernet1/1/1
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 999
 switchport trunk allowed vlan 164,165,179
 switchport mode trunk
 ip arp inspection trust
 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
 ip dhcp snooping trust
!
interface TenGigabitEthernet1/1/2
!
interface GigabitEthernet2/0/24
 description *** Wireless AP ***
 switchport access vlan 164
 switchport mode access
 switchport voice vlan 165
 switchport port-security maximum 11
 switchport port-security
 switchport port-security aging time 2
```

```
 switchport port-security violation restrict
 switchport port-security aging type inactivity
 ip arp inspection limit rate 100
 srr-queue bandwidth share 1 30 35 5
 queue-set 2
 priority-queue out
 mls qos trust dscp
 macro description AccessEdgeQoS
 auto qos trust dscp
 spanning-tree portfast
 ip verify source
 ip dhcp snooping limit rate 100
!
interface GigabitEthernet2/1/1
!
interface GigabitEthernet2/1/2
!
interface GigabitEthernet2/1/3
!
interface GigabitEthernet2/1/4
!
interface TenGigabitEthernet2/1/1
!
interface TenGigabitEthernet2/1/2
!
interface GigabitEthernet3/1/1
!
interface GigabitEthernet3/1/2
!
interface GigabitEthernet3/1/3
!
interface GigabitEthernet3/1/4
!
interface TenGigabitEthernet3/1/1
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 999
 switchport trunk allowed vlan 164,165,179
 switchport mode trunk
 ip arp inspection trust
 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
 ip dhcp snooping trust
!
interface TenGigabitEthernet3/1/2
!
interface Vlan1
 no ip address
!
interface Vlan179
 ip address 10.4.79.2 255.255.255.128
!
ip default-gateway 10.4.79.1
ip classless
no ip http server
ip http authentication aaa
ip http secure-server
!
ip access-list extended AUTOQOS-ACL-DEFAULT
 permit ip any any
!
ip sla enable reaction-alerts
snmp-server community ******** RO
snmp-server community ******** RW
tacacs-server host 10.4.48.15 key 7 073C244F5C0C0D2E120B
tacacs-server directed-request
!
!
line con 0
line vty 0 4
```

```
 transport input ssh
line vty 5 15
 transport input ssh
!
ntp clock-period 36028000
ntp server 10.4.48.17
end
```

Catalyst 4500+E Series Switch

The Cisco Catalyst 4500 E-Series are modular switches that support multiple Ethernet connectivity options including 10/100/1000 Ethernet, 100-MB fiber, gigabit fiber, and 10-gigabit fiber. The Catalyst 4500 E-Series switches also have an upgradable supervisor module which enables future functionality to be added with a supervisor module upgrade while maintaining the initial investment in the chassis and the modules.

```
version 15.0
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
service compress-config
!
hostname A4507R
!
boot-start-marker
boot-end-marker
!
enable secret 5 ********
!
username admin password 7 ********
!
macro name AccessEdgeQoS
qos trust device cisco-phone
service-policy input CISCOPHONE-POLICY
service-policy output 1P7Q1T
@
macro name EgressQoS
service-policy output 1P7Q1T
@
!
aaa new-model
!
!
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
clock summer-time PDT recurring
hw-module uplink select tengigabitethernet
udld enable

ip subnet-zero
ip arp inspection vlan 100-101
ip domain-name cisco.local
!
!
ip dhcp snooping vlan 100-101
no ip dhcp snooping information option
ip dhcp snooping
ip vrf mgmtVrf
!
vtp mode transparent
!
!
crypto pki trustpoint TP-self-signed-122739
 enrollment selfsigned
 subject-name cn=IOS-Self-Signed-Certificate-122739
 revocation-check none
 rsakeypair TP-self-signed-122739
!
!
crypto pki certificate chain TP-self-signed-122739
 certificate self-signed 01
 30820242 308201AB A0030201 02020101 300D0609 2A864886 F70D0101
04050030
 2D312B30 29060355 04031322 494F532D 53656C66 2D536967 6E65642D
43657274
 69666963 6174652D 31323237 3339301E 170D3130 30393234 30393132
35335A17
 0D323030 31303130 30303030 305A302D 312B3029 06035504 03132249
4F532D53
 656C662D 5369676E 65642D43 65727469 66696361 74652D31 32323733
3930819F
 300D0609 2A864886 F70D0101 01050003 818D0030 81890281 8100ED11
30C42976
 81CE2754 ABFE23DF 52442D51 5475B23B 030FC2CB 8A615C90 68FC3260
5EDDAE47
 E4DE3125 81E4B091 2EA65D26 C1791910 DB910937 9CDD34D9 9EAA7974
57CC096C
 15DE296D 298CDD15 770C9B6F 64D4A304 F7183322 60542AC2 B222AABC
21834439
 958C1368 79F2EC3C C2827AE9 37586F50 02575752 E5134EE0 38E70203
010001A3
 72307030 0F060355 1D130101 FF040530 030101FF 301D0603 551D1104
16301482
 12413435 3037522E 63697363 6F2E6C6F 63616C30 1F060355 1D230418
30168014
 93174066 F8203B1B 8266C368 6C51342B D668489D 301D0603 551D0E04
16041493
 174066F8 203B1B82 66C3686C 51342BD6 68489D30 0D06092A 864886F7
0D010104
 05000381 81007D5E BDFE9D3E B89C3DED DB6D1A8C 108323DE F86C6B61
33712152
 BEE057DF 84389EF6 4D473C64 62642BE1 54E97C5B 1FCA3791 65B34C69
5210428D
 8C49DC73 82AF1930 49F380A7 D66576A4 2C71E045 EE9B339D 3A498FA7
B6A489FA
 9BA039D7 C61F3253 AFAAB4F6 6409A561 BE6F1A14 08AC8614 12B6E7EC
3A073C62
 8D3441F2 BE3A
 quit
power redundancy-mode redundant
!
!
!
```

```
!
spanning-tree mode rapid-pvst
spanning-tree portfast bpduguard default
spanning-tree extend system-id
!
redundancy
 mode sso
!
vlan internal allocation policy ascending
!
vlan 100
 name A4500data
!
vlan 101
 name A4500voice
!
vlan 115
 name MgmtVLAN
!
vlan 999
 name antiVLANhopping
!
ip ssh version 2
!
class-map match-any MULTIMEDIA-STREAMING-QUEUE
 match dscp af31 af32 af33
class-map match-any CONTROL-MGMT-QUEUE
 match dscp cs7
 match dscp cs6
 match dscp cs3
 match dscp cs2
class-map match-any TRANSACTIONAL-DATA-QUEUE
 match dscp af21 af22 af23
class-map match-any SCAVENGER-QUEUE
 match dscp cs1
class-map match-any MULTIMEDIA-CONFERENCING-QUEUE
 match dscp af41 af42 af43
class-map match-any VOIP_SIGNAL_CLASS
 match cos 3
class-map match-any BULK-DATA-QUEUE
 match dscp af11 af12 af13
class-map match-any VOIP_DATA_CLASS
 match cos 5
class-map match-any PRIORITY-QUEUE
 match dscp ef
 match dscp cs5
 match dscp cs4
!
policy-map CISCOPHONE-POLICY
 class VOIP_DATA_CLASS
 set dscp ef
 police cir 128000 bc 8000
 conform-action transmit
 exceed-action drop
 class VOIP_SIGNAL_CLASS
 set dscp cs3
 police cir 32000 bc 8000
 conform-action transmit
 exceed-action drop
 class class-default
 set dscp default
 police cir 10000000 bc 8000
 conform-action transmit
 exceed-action set-dscp-transmit cs1
policy-map 1P7Q1T
 class PRIORITY-QUEUE
 priority
 class CONTROL-MGMT-QUEUE
 bandwidth remaining percent 10
 class MULTIMEDIA-CONFERENCING-QUEUE
 bandwidth remaining percent 10
 class MULTIMEDIA-STREAMING-QUEUE
 bandwidth remaining percent 10
 class TRANSACTIONAL-DATA-QUEUE
```

```
 bandwidth remaining percent 10
 dbl
 class BULK-DATA-QUEUE
 bandwidth remaining percent 4
 dbl
 class SCAVENGER-QUEUE
 bandwidth remaining percent 1
 class class-default
 bandwidth remaining percent 25
 dbl
!
!
!
interface Port-channel1
 switchport
 switchport trunk native vlan 999
 switchport trunk allowed vlan 100,101,115
 switchport mode trunk
 ip arp inspection trust
 logging event link-status
 logging event trunk-status
 ip dhcp snooping trust
!
interface FastEthernet1
 ip vrf forwarding mgmtVrf
 no ip address
 speed auto
 duplex auto
!
interface GigabitEthernet1/1
 switchport access vlan 100
 switchport mode access
 switchport voice vlan 101
 switchport port-security maximum 11
 switchport port-security
 switchport port-security aging time 2
 switchport port-security violation restrict
 switchport port-security aging type inactivity
 ip arp inspection limit rate 100
 qos trust device cisco-phone
 macro description AccessEdgeQoS
 spanning-tree portfast
 service-policy input CISCOPHONE-POLICY
 service-policy output 1P7Q1T
 ip verify source vlan dhcp-snooping
 ip dhcp snooping limit rate 100
!
interface GigabitEthernet1/2
 switchport access vlan 100
 switchport mode access
 switchport voice vlan 101
 switchport port-security maximum 11
 switchport port-security
 switchport port-security aging time 2
 switchport port-security violation restrict
 switchport port-security aging type inactivity
 ip arp inspection limit rate 100
 qos trust device cisco-phone
 macro description AccessEdgeQoS
 spanning-tree portfast
 service-policy input CISCOPHONE-POLICY
 service-policy output 1P7Q1T
 ip verify source vlan dhcp-snooping
 ip dhcp snooping limit rate 100
!
! ************************************************************
*******
! Interface GigabitEthernet 1/3 - 2/48 are all configured the
same as
! 1/1 and 1/2 and have been removed for conciseness
! ************************************************************
*******
!
interface GigabitEthernet2/24
```

```
 description *** Wireless AP ***
 switchport access vlan 100
 switchport mode access
 switchport voice vlan 101
 switchport port-security maximum 11
 switchport port-security
 switchport port-security aging time 2
 switchport port-security violation restrict
 switchport port-security aging type inactivity
 ip arp inspection limit rate 100
 macro description EgressQoS
 spanning-tree portfast
 service-policy output 1P7Q1T
 ip verify source vlan dhcp-snooping
 ip dhcp snooping limit rate 100
!
interface TenGigabitEthernet3/1
 description to D6500VSS
 switchport trunk native vlan 999
 switchport trunk allowed vlan 100,101,115
 switchport mode trunk
 ip arp inspection trust
 logging event link-status
 logging event trunk-status
 macro description EgressQoS
 channel-protocol lacp
 channel-group 1 mode active
 service-policy output 1P7Q1T
 ip dhcp snooping trust
!
interface TenGigabitEthernet3/2
!
interface GigabitEthernet3/3
!
interface GigabitEthernet3/4
!
interface GigabitEthernet3/5
!
interface GigabitEthernet3/6
!
interface TenGigabitEthernet4/1
 description to D6500VSS
 switchport trunk native vlan 999
 switchport trunk allowed vlan 100,101,115
 switchport mode trunk
 ip arp inspection trust
 logging event link-status
 logging event trunk-status
 macro description EgressQoS
 channel-protocol lacp
 channel-group 1 mode active
 service-policy output 1P7Q1T
 ip dhcp snooping trust
!
interface TenGigabitEthernet4/2
!
interface GigabitEthernet4/3
!
interface GigabitEthernet4/4
!
interface GigabitEthernet4/5
!
interface GigabitEthernet4/6
!
interface Vlan1
 no ip address
!
interface Vlan115
 ip address 10.4.15.2 255.255.255.128
!
ip route 0.0.0.0 0.0.0.0 10.4.15.1
no ip http server
ip http authentication aaa
ip http secure-server
```

```
!
!
!
snmp-server community ******** RO
snmp-server community ******** RW
tacacs-server host 10.4.48.15 key 7 142417081E013E002131
tacacs-server directed-request
!
line con 0
 stopbits 1
line vty 0 4
 transport input ssh
line vty 5 15
 transport input ssh
!
ntp clock-period 17180161
ntp update-calendar
ntp server 10.4.48.17
end
```

Distribution Layer Configurations

Catalyst 3750X-12S Switch

Configured as a single unit, but has independent load-sharing power supplies and processor for each switch in the StackWise Plus stack. The SBA for Enterprise Organizations—Borderless Network Architecture uses a pair of stacked 3750X-12S-E switches that provide Layer 2 and Layer 3 switching. The switches use Small Form-Factor Pluggable (SFP) transcievers for a port-by-port option of copper or fiber optic Gigabit Ethernet EtherChannel uplinks to access closets.

```
version 15.0
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname D3750X
!
boot-start-marker
boot-end-marker
!
!
enable secret 5 $1$x/gO$WqAw9wIJBKZzPsRjMQDge/
!
username admin password 7 0007421507545A545C
aaa new-model
!
!
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
switch 3 provision ws-c3750x-12s
stack-mac persistent timer 0
system mtu routing 1500
ip routing
!
!
!
ip domain-name cisco.local
ip multicast-routing distributed
vtp mode transparent
udld enable

!
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
!
crypto pki trustpoint TP-self-signed-2107318144
 enrollment selfsigned
 subject-name cn=IOS-Self-Signed-Certificate-2107318144
 revocation-check none
 rsakeypair TP-self-signed-2107318144
!
!
crypto pki certificate chain TP-self-signed-2107318144
 certificate self-signed 01
  3082024A 308201B3 A0030201 02020101 300D0609 2A864886 F70D0101
04050030
  31312F30 2D060355 04031326 494F532D 53656C66 2D536967 6E65642D
43657274
  69666963 6174652D 32313037 33313831 3434301E 170D3933 30333132
30313239
  31385A17 0D323030 31303130 30303030 305A3031 312F302D 06035504
03132649
  4F532D53 656C662D 5369676E 65642D43 65727469 66696361 74652D32
31303733
  31383134 3430819F 300D0609 2A864886 F70D0101 01050003 818D0030
81890281
  8100D566 D0C01B72 33040AA8 61B4BEBE D48ADB51 C5C3CCC6 C27A3EB0
A854F071
  C9FB07EA 1349D39C 65CB36C4 B46E8F5D F365F758 2407D645 F388D85A
8B03A827
  D90C8A69 1620A3E0 C28E89C3 78D06BF5 4E693636 C331F3EA 2E8BA850
5DB5ACBA
  3C0ED380 24C7C9C2 A630BE9F AC94D7AB 50A17DD6 10C4D3F7 65FA32FB
E096F1A4
  DF590203 010001A3 72307030 0F060355 1D130101 FF040530 030101FF
301D0603
  551D1104 16301482 12443337 3530582E 63697363 6F2E6C6F 63616C30
1F060355
  1D230418 30168014 40AE34B7 07D53D3B 968EEB59 206B48B6 CB20CEDE
301D0603
  551D0E04 16041440 AE34B707 D53D3B96 8EEB5920 6B48B6CB 20CEDE30
0D06092A
  864886F7 0D010104 05000381 81007E49 C622786B A5B16F3B 40330A7A
D1547A74
  DD998852 168F7248 F8572016 B8CE42A8 3348C96C E0ED1590 91AD5EA5
2316EC5E
  BDFDBCDF 50E6FC36 DBA9C6D3 74B49A7F A3AA1A10 6C5E39FF 002B6BE0
```

```
E709C254
  45A3C86D FEE9388E 8387C3B0 3325326B 54C797BB B2DB4A44 5B2D378D
EB8381D5
  7F5A4DF4 C0CD034E B4F8F66A 8476
       quit
!
spanning-tree mode rapid-pvst
spanning-tree extend system-id
spanning-tree vlan 180-195 priority 24576
!
!
!
port-channel load-balance src-dst-ip
!
vlan internal allocation policy ascending
!
vlan 180-195,999
!
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 10.4.95.254 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel1
 description A2960S Po 1
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 999
 switchport trunk allowed vlan 180,181,195
 switchport mode trunk
 logging event link-status
!
interface Port-channel31
 description C6509-1 Po 31
 no switchport
 ip address 10.4.40.14 255.255.255.252
 ip pim sparse-mode
 logging event link-status
 carrier-delay msec 0
!
interface Port-channel36
 description C6509-2 Po 36
 no switchport
 ip address 10.4.40.26 255.255.255.252
 ip pim sparse-mode
 logging event link-status
 carrier-delay msec 0
!
interface FastEthernet0
 no ip address
 no ip route-cache cef
 no ip route-cache
 shutdown
!
interface GigabitEthernet1/0/1
 description A2960S Gig 1/0/25
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 999
 switchport trunk allowed vlan 180,181,195
 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 1 mode active
!
interface GigabitEthernet1/0/2
!
interface GigabitEthernet1/0/3
!
interface GigabitEthernet1/0/4
!
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/1/1
 description C6509-1 Po 31
 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 31 mode active
!
interface GigabitEthernet1/1/2
!
interface GigabitEthernet1/1/3
 description C6509-2 Po 36
 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 36 mode active
!
interface GigabitEthernet1/1/4
!
interface TenGigabitEthernet1/1/1
!
interface TenGigabitEthernet1/1/2
!
interface GigabitEthernet2/0/1
!
interface GigabitEthernet2/0/2
```

```
!
interface GigabitEthernet2/0/3
!
interface GigabitEthernet2/0/4
!
interface GigabitEthernet2/0/5
!
interface GigabitEthernet2/0/6
!
interface GigabitEthernet2/0/7
!
interface GigabitEthernet2/0/8
!
interface GigabitEthernet2/0/9
!
interface GigabitEthernet2/0/10
!
interface GigabitEthernet2/0/11
!
interface GigabitEthernet2/0/12
!
interface GigabitEthernet2/1/1
!
interface GigabitEthernet2/1/2
!
interface GigabitEthernet2/1/3
!
interface GigabitEthernet2/1/4
!
interface TenGigabitEthernet2/1/1
!
interface TenGigabitEthernet2/1/2
!
interface GigabitEthernet3/0/1
 description A2960S Gig 3/0/25
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 999
 switchport trunk allowed vlan 180,181,195
 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 1 mode active
!
interface GigabitEthernet3/0/2
!
interface GigabitEthernet3/0/3
!
interface GigabitEthernet3/0/4
!
interface GigabitEthernet3/0/5
!
interface GigabitEthernet3/0/6
!
interface GigabitEthernet3/0/7
!
interface GigabitEthernet3/0/8
!
interface GigabitEthernet3/0/9
!
interface GigabitEthernet3/0/10
!
interface GigabitEthernet3/0/11
!
interface GigabitEthernet3/0/12
!
interface GigabitEthernet3/1/1
 description C6509-1 Po 31
```

```
 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 31 mode active
!
interface GigabitEthernet3/1/2
!
interface GigabitEthernet3/1/3
 description C6509-2 Po 36
 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 36 mode active
!
interface GigabitEthernet3/1/4
!
interface TenGigabitEthernet3/1/1
!
interface TenGigabitEthernet3/1/2
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan180
 ip address 10.4.80.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan181
 ip address 10.4.81.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan182
 ip address 10.4.82.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan183
 ip address 10.4.83.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan184
 ip address 10.4.84.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan185
 ip address 10.4.85.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan186
 ip address 10.4.86.1 255.255.255.0
```

```
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan187
 ip address 10.4.87.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan188
 ip address 10.4.88.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan189
 ip address 10.4.89.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan190
 ip address 10.4.90.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan191
 ip address 10.4.91.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan192
 ip address 10.4.92.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan193
 ip address 10.4.93.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan194
 ip address 10.4.94.1 255.255.255.0
 ip helper-address 10.4.48.10
  ip pim sparse-mode
!
interface Vlan195
 ip address 10.4.95.1 255.255.255.128
!
!
router eigrp 100
 network 10.4.0.0 0.1.255.255
 passive-interface default
 no passive-interface Port-channel31
 no passive-interface Port-channel36
 eigrp router-id 10.4.95.254
 nsf
!
!
ip http server
ip http authentication aaa
ip http secure-server
!
ip pim autorp listener
ip pim register-source Loopback0
ip tacacs source-interface Loopback0
!
logging esm config
logging 10.4.48.35
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
snmp-server system-shutdown
tacacs-server host 10.4.48.15 key 7 15210E0F162F3F0F2D2A
!
!
```

```
!
!
line con 0
line vty 0 4
 exec-timeout 0 0
 length 0
 transport input ssh
line vty 5 15
 exec-timeout 0 0
 transport input ssh
!
ntp source Loopback0
ntp server 10.4.48.17
end
```

Catalyst 4507R+E Switch

Cisco Catalyst 4507R+E switch has redundant supervisors, line cards, and power supplies. In this design, we use a single 4507R+E chassis configured with resilient components as a distribution layer platform. The Supervisor 7E has the ability to provide a medium density of Gigabit Ethernet and even 10 Gigabit Ethernet EtherChannel links to the access layer.

```
version 15.0
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
service compress-config
!
hostname D4507R
!
boot-start-marker
license boot level entservices
boot-end-marker
!
logging event link-status global
enable secret 5 ********
!
username admin password 7 ********
!
macro name EgressQoS
service-policy output 1P7Q1T
@
!
aaa new-model
!
!
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
clock summer-time PDT recurring
udld enable

ip subnet-zero
ip domain-name cisco.local
ip vrf Mgmt-vrf
!
ip multicast-routing
!
!
vtp mode transparent
!
crypto pki trustpoint TP-self-signed-142689
 enrollment selfsigned
 subject-name cn=IOS-Self-Signed-Certificate-142689
 revocation-check none
 rsakeypair TP-self-signed-142689
!
!
crypto pki certificate chain TP-self-signed-142689
 certificate self-signed 01
 30820242 308201AB A0030201 02020101 300D0609 2A864886 F70D0101
04050030
 2D312B30 29060355 04031322 494F532D 53656C66 2D536967 6E65642D
43657274
 69666963 6174652D 31343236 3839301E 170D3130 30393233 31353230
30325A17
 0D323030 31303130 30303030 305A302D 312B3029 06035504 03132249
4F532D53
 656C662D 5369676E 65642D43 65727469 66696361 74652D31 34323638
3930819F
 300D0609 2A864886 F70D0101 01050003 818D0030 81890281 8100BBC1
2EC02B9F
 693ED991 6A729442 8C392560 C4E99E5C FA52A13B 4AF8C58F 7C9E8D08
AE06C66D
 0650A60F E4FCA579 AE4B8F8F FEBF3407 1568FA75 BEF5FF22 44723CBE
C4FBF6CA
 8CB65667 76055AD9 B956E5C4 6CAB4B3D 1EA96DA9 169B40F4 ADE68488
C11415FF
 89E78051 592F3162 AD046F96 2DCB7BB2 9C4C6138 3ACF9182 B8070203
010001A3
 72307030 0F060355 1D130101 FF040530 030101FF 301D0603 551D1104
16301482
 12443435 3037522E 63697363 6F2E6C6F 63616C30 1F060355 1D230418
30168014
 83DA0C21 7BD4DE0C FA7EC341 E943633D 93777DA1 301D0603 551D0E04
16041483
 DA0C217B D4DE0CFA 7EC341E9 43633D93 777DA130 0D06092A 864886F7
0D010104
 05000381 81003CE8 0F2C4439 58C822C9 47158AFB AF613513 9644265A
178B4485
 CFA68859 2FDEC501 A8499CAB EDA06F32 AF2F9405 275CD2B6 C5069869
C2534487
 472CAF91 D9A34AE4 2B7274BD 783754BF 2121DE9F DBFF6830 70F2AC21
150B55BC
 31EF364E 64C02CE2 E27B23A3 499870CC B021A581 47BF53E7 62D8B2BE
B9240C08
 17139438 C723
 quit
!
power redundancy-mode redundant
!
!
!
!
spanning-tree mode rapid-pvst
spanning-tree extend system-id
spanning-tree vlan 164-179,902 priority 24576
!
redundancy
 mode sso
!
```

```
vlan internal allocation policy ascending
!
vlan 164
 name A3750Xdata
!
vlan 165
 name A3750Xvoice
!
vlan 179
 name MgmtVLAN
!
vlan 999
 name antiVLANhopping
!
ip ssh source-interface Loopback1
ip ssh version 2
!
class-map match-any MULTIMEDIA-STREAMING-QUEUE
 match dscp af31 af32 af33
class-map match-any CONTROL-MGMT-QUEUE
 match dscp cs7
 match dscp cs6
 match dscp cs3
 match dscp cs2
class-map match-any TRANSACTIONAL-DATA-QUEUE
 match dscp af21 af22 af23
class-map match-any SCAVENGER-QUEUE
 match dscp cs1
class-map match-any MULTIMEDIA-CONFERENCING-QUEUE
 match dscp af41 af42 af43
class-map match-any BULK-DATA-QUEUE
 match dscp af11 af12 af13
class-map match-any PRIORITY-QUEUE
 match dscp ef
 match dscp cs5
 match dscp cs4
!
policy-map 1P7Q1T
 class PRIORITY-QUEUE
 priority
 class CONTROL-MGMT-QUEUE
 bandwidth remaining percent 10
 class MULTIMEDIA-CONFERENCING-QUEUE
 bandwidth remaining percent 10
 class MULTIMEDIA-STREAMING-QUEUE
 bandwidth remaining percent 10
 class TRANSACTIONAL-DATA-QUEUE
 bandwidth remaining percent 10
 dbl
 class BULK-DATA-QUEUE
 bandwidth remaining percent 4
 dbl
 class SCAVENGER-QUEUE
 bandwidth remaining percent 1
 class class-default
 bandwidth remaining percent 25
 dbl
!
!
!
interface Loopback0
 ip address 10.4.79.254 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel1
 switchport
 switchport trunk native vlan 999
 switchport trunk allowed vlan 164,165,179
 switchport mode trunk
!
interface FastEthernet1
 ip vrf forwarding Mgmt-vrf
 no ip address
 shutdown
```

```
 speed auto
 duplex auto
!
interface TenGigabitEthernet1/1
!
interface TenGigabitEthernet1/2
 switchport trunk native vlan 999
 switchport trunk allowed vlan 164,165,179
 switchport mode trunk
 logging event link-status
 logging event trunk-status
 macro description EgressQoS
 channel-protocol lacp
 channel-group 1 mode active
 service-policy output 1P7Q1T
!
interface TenGigabitEthernet1/3
!
interface TenGigabitEthernet1/4
!
interface TenGigabitEthernet1/5
!
interface TenGigabitEthernet1/6
!
interface TenGigabitEthernet1/7
!
interface TenGigabitEthernet1/8
!
interface TenGigabitEthernet1/9
!
interface TenGigabitEthernet1/10
!
interface TenGigabitEthernet1/11
!
interface TenGigabitEthernet1/12
 no switchport
 ip address 10.4.40.30 255.255.255.252
 ip pim sparse-mode
 ip summary-address eigrp 100 10.4.64.0 255.255.240.0
 carrier-delay msec 0
 macro description EgressQoS
 service-policy output 1P7Q1T
!
interface TenGigabitEthernet2/1
!
interface TenGigabitEthernet2/2
 switchport trunk native vlan 999
 switchport trunk allowed vlan 164,165,179
 switchport mode trunk
 logging event link-status
 logging event trunk-status
 macro description EgressQoS
 channel-protocol lacp
 channel-group 1 mode active
 service-policy output 1P7Q1T
!
interface TenGigabitEthernet2/3
!
interface TenGigabitEthernet2/4
!
interface TenGigabitEthernet2/5
!
interface TenGigabitEthernet2/6
!
interface TenGigabitEthernet2/7
!
interface TenGigabitEthernet2/8
!
interface TenGigabitEthernet2/9
!
interface TenGigabitEthernet2/10
!
interface TenGigabitEthernet2/11
!
```

```
interface TenGigabitEthernet2/12
 no switchport
 ip address 10.4.40.18 255.255.255.252
 ip pim sparse-mode
 ip summary-address eigrp 100 10.4.64.0 255.255.240.0
 carrier-delay msec 0
 macro description EgressQoS
 service-policy output 1P7Q1T
!
interface TenGigabitEthernet3/1
!
interface TenGigabitEthernet3/2
!
interface TenGigabitEthernet3/3
!
interface TenGigabitEthernet3/4
!
interface Vlan1
 no ip address
!
interface Vlan164
 ip address 10.4.64.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan165
 ip address 10.4.65.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan179
 ip address 10.4.79.1 255.255.255.128
!
router eigrp 100
 network 10.4.0.0 0.0.255.255
 passive-interface default
 no passive-interface TenGigabitEthernet1/12
 no passive-interface TenGigabitEthernet2/12
 eigrp router-id 10.4.79.254
 nsf
!
no ip http server
ip http authentication aaa
ip http secure-server
!
ip pim autorp listener
ip pim register-source Loopback0
ip tacacs source-interface Loopback0
!
!
!
snmp-server community ******** RO
snmp-server community ******** RW
snmp-server trap-source Loopback1
!
tacacs-server host 10.4.48.15 key 7 06350A225E4B1D32000E
tacacs-server directed-request
!
line con 0
 exec-timeout 30 0
 stopbits 1
line vty 0 4
 transport input ssh
line vty 5 15
 transport input ssh
line vty 16
!
!
ntp clock-period 17202641
ntp update-calendar
ntp server 10.4.48.17
end
```

Catalyst Virtual Switching System 4T

The Cisco Catalyst 6500 VSS 4T effectively allows the clustering of two physical chassis into a logical entity that can be operated as a single device. This configuration provides redundant chassis, supervisors, line cards, and power supplies and can provide the highest density of the product options for Gigabit Ethernet and 10 Gigabit Ethernet EtherChannel uplinks using Cisco Multi-chassis EtherChannel.

```
upgrade fpd auto
version 15.0
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
service counters max age 5
!
hostname D6500VSS
!
boot-start-marker
boot-end-marker
!
security passwords min-length 1
logging buffered 8192
enable secret 5 ********
!
username admin password 7 ********
aaa new-model
!
!
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
clock summer-time PDT recurring
!
!
!
ip multicast-routing
ip ssh source-interface Loopback1
ip ssh version 2
ip domain-name cisco.local
udld enable
vtp mode transparent
!
switch virtual domain 100
 switch mode virtual
 mac-address use-virtual
!
mls netflow interface
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
!
mls cef error action reset
!
crypto pki trustpoint TP-self-signed-1225
 enrollment selfsigned
 subject-name cn=IOS-Self-Signed-Certificate-1225
 revocation-check none
 rsakeypair TP-self-signed-1225
!
! Class maps for 1P7Q4T 10Gb ports service policy
 class-map type lan-queu match-any PRIORITY-QUEUE
  match dscp ef
  match dscp cs5
  match dscp cs4
```

```
 class-map type lan-queu match-any CONTROL-MGMT-QUEUE
  match dscp cs7
  match dscp cs6
  match dscp cs3
  match dscp cs2
 class-map type lan-queu match-any MULTIMEDIA-CONFERENCING-QUEUE
  match dscp af41 af42 af43
 class-map type lan-queu match-any MULTIMEDIA-STREAMING-QUEUE
  match dscp af31 af32 af33
 class-map type lan-queu match-any TRANSACTIONAL-DATA-QUEUE
  match dscp af21 af22 af23
 class-map type lan-queu match-any BULK-DATA-QUEUE
  match dscp af11 af12 af13
 class-map type lan-queu match-any SCAVENGER-QUEUE
  match dscp cs1
!
policy-map type lan-queuing 1P7Q4T
 class PRIORITY-QUEUE
  priority
  queue-limit percent 15
 class CONTROL-MGMT-QUEUE
  bandwidth remaining percent 10
  queue-limit percent 10
  random-detect dscp-based
  random-detect dscp 16 percent 60 70
  random-detect dscp-based
  random-detect dscp 24 percent 70 80
  random-detect dscp-based
  random-detect dscp 48 percent 80 90
  random-detect dscp-based
  random-detect dscp 56 percent 90 100
 class MULTIMEDIA-CONFERENCING-QUEUE
  bandwidth remaining percent 10
  queue-limit percent 10
  random-detect dscp-based
  random-detect dscp 38 percent 70 80
  random-detect dscp-based
  random-detect dscp 36 percent 80 90
  random-detect dscp-based
  random-detect dscp 34 percent 90 100
 class MULTIMEDIA-STREAMING-QUEUE
  bandwidth remaining percent 10
  queue-limit percent 10
  random-detect dscp-based
  random-detect dscp 30 percent 70 80
  random-detect dscp-based
  random-detect dscp 28 percent 80 90
  random-detect dscp-based
  random-detect dscp 26 percent 90 100
 class TRANSACTIONAL-DATA-QUEUE
  bandwidth remaining percent 10
  queue-limit percent 10
  random-detect dscp-based
  random-detect dscp 22 percent 70 80
  random-detect dscp-based
  random-detect dscp 20 percent 80 90
  random-detect dscp-based
  random-detect dscp 18 percent 90 100
 class BULK-DATA-QUEUE
  bandwidth remaining percent 4
  queue-limit percent 10
  random-detect dscp-based
  random-detect dscp 14 percent 70 80
  random-detect dscp-based
  random-detect dscp 12 percent 80 90
  random-detect dscp-based
  random-detect dscp 10 percent 90 100
 class class-default
  bandwidth remaining percent 25
  queue-limit percent 25
  random-detect dscp-based
  random-detect dscp 0 percent 80 100
 class SCAVENGER-QUEUE
  bandwidth remaining percent 1
```

```
  queue-limit percent 10
  random-detect dscp-based
  random-detect dscp 8 percent 80 100
!
! Class maps for 1P3Q8T 1Gb ports service policy
class-map type lan-queu match-any PRIORITY-QUEUE-GIG
 match cos 5 4
class-map type lan-queu match-any CONTROL-AND-STREAM-MEDIA
 match cos 7 6 3 2
class-map type lan-queu match-any BULK-DATA-SCAVENGER
 match cos 1
!
policy-map type lan-queuing 1P3Q8T
 class PRIORITY-QUEUE-GIG
  priority
  queue-limit percent 15
 class CONTROL-AND-STREAM-MEDIA
  bandwidth remaining 40
  queue-limit percent 40
  random-detect cos-based
  random-detect cos 2 percent 60 70
  random-detect cos-based
  random-detect cos 3 percent 70 80
  random-detect cos-based
  random-detect cos 6 percent 80 90
  random-detect cos-based
  random-detect cos 7 percent 90 100
 class class-default
  bandwidth remaining 25
  queue-limit percent 25
  random-detect cos-based
  random-detect cos 0 percent 80 100
 class BULK-DATA-SCAVENGER
  bandwidth remaining 5
  queue-limit percent 20
  random-detect cos-based
  random-detect cos 1 percent 80 100
!
macro name EgressQoSTenGig
  service-policy type lan-queuing output 1P7Q4T
@
!
macro name EgressQoSGig
  service-policy type lan-queuing output 1P3Q8T
@
!
!
!
spanning-tree mode rapid-pvst
spanning-tree vlan 100-107,900-901 priority 8192
diagnostic bootup level minimal
!
redundancy
 main-cpu
 auto-sync running-config
 mode sso
!
vlan internal allocation policy ascending
vlan access-log ratelimit 2000
!
vlan 100
 name A4500data
!
vlan 101
 name A4500voice
!
vlan 102
 name vlan102
!
vlan 103
 name vlan103
!
vlan 104
 name vlan104
```

```
!
vlan 105
 name vlan105
!
vlan 106
 name vlan106
!
vlan 107
 name vlan107
!
vlan 115
 name MgmtVLAN
!
vlan 999
 name antiVLANhopping
!
!
!
interface Loopback0
 ip address 10.4.15.254 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel1
 switchport
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 999
 switchport trunk allowed vlan 100,101,115
 switchport mode trunk
 !
interface Port-channel30
 no switchport
 ip address 10.4.40.10 255.255.255.252
 ip pim sparse-mode
 ip summary-address eigrp 100 10.4.0.0 255.255.240.0
!
interface Port-channel35
 no switchport
 ip address 10.4.40.22 255.255.255.252
 ip pim sparse-mode
 ip summary-address eigrp 100 10.4.0.0 255.255.240.0
!
interface Port-channel101
 no switchport
 no ip address
 switch virtual link 1
 no mls qos channel-consistency
!
interface Port-channel102
 no switchport
 no ip address
 switch virtual link 2
 no mls qos channel-consistency
!
interface GigabitEthernet1/1/1
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/2
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/3
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/4
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/5
```

```
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/6
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/7
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/8
 no switchport
 no ip address
 dual-active fast-hello
!
interface GigabitEthernet1/1/9
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/10
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/11
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/12
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/13
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/14
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/15
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/16
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/17
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/18
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/19
 no switchport
 no ip address
 shutdown
!
```

```
interface GigabitEthernet1/1/20
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/21
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/22
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/23
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/24
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/25
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/26
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/27
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/28
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/29
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/30
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/31
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/32
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/33
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/34
 no switchport
 no ip address
 shutdown
```

```
!
interface GigabitEthernet1/1/35
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/36
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/37
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/38
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/39
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/40
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/41
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/42
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/43
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/44
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/45
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/46
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/47
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/1/48
 no switchport
 no ip address
 shutdown
!
interface TenGigabitEthernet1/4/1
 no switchport
 no ip address
```

```
 logging event link-status
 logging event bundle-status
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 channel-protocol lacp
 channel-group 35 mode active
!
interface TenGigabitEthernet1/4/2
 no switchport
 no ip address
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 shutdown
!
interface TenGigabitEthernet1/4/3
 no switchport
 no ip address
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 shutdown
!
interface TenGigabitEthernet1/4/4
 no switchport
 no ip address
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 shutdown
!
interface TenGigabitEthernet1/4/5
 no switchport
 no ip address
 logging event link-status
 logging event bundle-status
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 channel-protocol lacp
 channel-group 30 mode active
!
interface TenGigabitEthernet1/4/6
 no switchport
 no ip address
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 shutdown
!
interface TenGigabitEthernet1/4/7
 no switchport
 no ip address
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 shutdown
!
interface TenGigabitEthernet1/4/8
 no switchport
 no ip address
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 shutdown
!
interface TenGigabitEthernet1/4/9
 switchport
 switchport trunk native vlan 999
 switchport trunk allowed vlan 100,101,115
 switchport mode trunk
 logging event link-status
 logging event bundle-status
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 channel-protocol lacp
 channel-group 1 mode active
!
interface TenGigabitEthernet1/4/10
 no switchport
 no ip address
```

```
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 shutdown
!
interface TenGigabitEthernet1/4/11
 no switchport
 no ip address
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 shutdown
!
interface TenGigabitEthernet1/4/12
 no switchport
 no ip address
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 shutdown
!
interface TenGigabitEthernet1/4/13
 no switchport
 no ip address
 shutdown
!
interface TenGigabitEthernet1/4/14
 no switchport
 no ip address
 shutdown
!
interface TenGigabitEthernet1/4/15
 no switchport
 no ip address
 shutdown
!
interface TenGigabitEthernet1/4/16
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/5/1
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/5/2
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet1/5/3
 no switchport
 no ip address
 shutdown
!
interface TenGigabitEthernet1/5/4
 no switchport
 no ip address
 channel-group 101 mode on
!
interface TenGigabitEthernet1/5/5
 no switchport
 no ip address
 channel-group 101 mode on
!
interface GigabitEthernet2/1/1
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/2
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/3
```

```
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/4
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/5
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/6
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/7
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/8
 no switchport
 no ip address
 dual-active fast-hello
!
interface GigabitEthernet2/1/9
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/10
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/11
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/12
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/13
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/14
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/15
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/16
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/17
 no switchport
 no ip address
 shutdown
!
```

```
interface GigabitEthernet2/1/18
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/19
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/20
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/21
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/22
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/23
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/1/24
 no switchport
 no ip address
 shutdown
!
interface TenGigabitEthernet2/4/1
 no switchport
 no ip address
 logging event link-status
 logging event bundle-status
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 channel-protocol lacp
 channel-group 30 mode active
!
interface TenGigabitEthernet2/4/2
 no switchport
 no ip address
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 shutdown
!
interface TenGigabitEthernet2/4/3
 no switchport
 no switchport
 no ip address
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 shutdown
!
interface TenGigabitEthernet2/4/4
 no switchport
 no ip address
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 shutdown
!
interface TenGigabitEthernet2/4/5
 no switchport
 no ip address
 logging event link-status
 logging event bundle-status
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
```

```
 channel-protocol lacp
 channel-group 35 mode active
!
interface TenGigabitEthernet2/4/6
 no switchport
 no ip address
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 shutdown
!
interface TenGigabitEthernet2/4/7
 no switchport
 no ip address
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 shutdown
!
interface TenGigabitEthernet2/4/8
 no switchport
 no ip address
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 shutdown
!
interface TenGigabitEthernet2/4/9
 switchport
 switchport trunk native vlan 999
 switchport trunk allowed vlan 100,101,115
 switchport mode trunk
 logging event link-status
 logging event bundle-status
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 channel-protocol lacp
 channel-group 1 mode active
!
interface TenGigabitEthernet2/4/10
 no switchport
 no ip address
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 shutdown
!
interface TenGigabitEthernet2/4/11
 no switchport
 no ip address
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 shutdown
!
interface TenGigabitEthernet2/4/12
 no switchport
 no ip address
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
 shutdown
!
interface TenGigabitEthernet2/4/13
 no switchport
 no ip address
 shutdown
!
interface TenGigabitEthernet2/4/14
 no switchport
 no ip address
 shutdown
!
interface TenGigabitEthernet2/4/15
 no switchport
 no ip address
 shutdown
!
interface TenGigabitEthernet2/4/16
 no switchport
```

```
 no ip address
 shutdown
!
interface GigabitEthernet2/5/1
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/5/2
 no switchport
 no ip address
 shutdown
!
interface GigabitEthernet2/5/3
 no switchport
 no ip address
 shutdown
!
interface TenGigabitEthernet2/5/4
 no switchport
 no ip address
 channel-group 102 mode on
!
interface TenGigabitEthernet2/5/5
 no switchport
 no ip address
 channel-group 102 mode on
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan100
 ip address 10.4.0.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan101
 ip address 10.4.1.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!
interface Vlan115
 ip address 10.4.15.1 255.255.255.128
!
!
router eigrp 100
 network 10.4.0.0 0.0.255.255
 passive-interface default
 no passive-interface Port-channel35
 no passive-interface Port-channel30
 eigrp router-id 10.4.15.254
 nsf
!
ip classless
!
!
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
!
snmp-server engineID local 800000090300000000000000
snmp-server community ******** RO
snmp-server community ******** RW
snmp-server trap-source Loopback1
tacacs-server host 10.4.48.15 key 7 0538030C33495A221C1C
tacacs-server directed-request
!
!
control-plane
```

```
!
!
dial-peer cor custom
!
!
!
!
line con 0
line vty 0 4
 transport input ssh
line vty 5 15
 transport input ssh
!
ntp clock-period 17179962
ntp update-calendar
ntp server 10.4.48.17
mac-address-table aging-time 480
```

Core Layer Configurations

Catalyst 6500 Series Switch

The Cisco Catalyst 6500 Series switch, powered by the Supervisor 2T, is the premier LAN core platform. It delivers scalable performance, intelligence, and a broad set of features to address the needs of the most demanding enterprise deployments requirements for building a modular, resilient, scalable, and secure Layer 3 backbone solution.

```
upgrade fpd auto
version 15.0
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
service counters max age 5
!
hostname C6509R
!
boot-start-marker
boot-end-marker
!
security passwords min-length 1
enable secret 5 ********
!
username admin password 7 ********
aaa new-model
!
!
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
clock summer-time UTC recurring
!
!
!
ip multicast-routing
ip ssh source-interface Loopback1
ip ssh version 2
ip domain-name cisco.local
udld enable

vtp mode transparent
mls netflow interface
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
!
mls cef error action reset
!
crypto pki trustpoint TP-self-signed-1233
 enrollment selfsigned
 subject-name cn=IOS-Self-Signed-Certificate-1233
 revocation-check none
 rsakeypair TP-self-signed-1233
!
!
crypto pki certificate chain TP-self-signed-1233
 certificate self-signed 01
 3082023E 308201A7 A0030201 02020101 300D0609 2A864886 F70D0101
04050030
```

```
 2B312930 27060355 04031320 494F532D 53656C66 2D536967 6E65642D
43657274
 69666963 6174652D 31323333 301E170D 31303035 32303139 31343334
5A170D32
 30303130 31303030 3030305A 302B3129 30270603 55040313 20494F53
2D53656C
 662D5369 676E6564 2D436572 74696669 63617465 2D313233 3330819F
300D0609
 2A864886 F70D0101 01050003 818D0030 81890281 8100B9E1 5E9F1DCA
C85662E0
 E823CD15 E6148A3B 9AB3AECA 729B5DB7 EC1F1055 3D9336D9 F3CEB317
7E72169F
 CC35135B 2C690CBE 24A510ED 9321F005 A79EBC61 C549B1BF 5F792CEF
64BB023E
 3B0A7C38 EE7F6788 6F578494 80F28029 9BCAA897 467027C2 C716F743
DE8C3FE1
 CBB8E67F A8530F2A C6FAA003 E57CE7FB 75BD97FB A8EF0203 010001A3
72307030
 0F060355 1D130101 FF040530 030101FF 301D0603 551D1104 16301482
12433635
 3039522E 63697363 6F2E6C6F 63616C30 1F060355 1D230418 30168014
85E4A85B
 35897A94 6C6762C8 68CD14CE 4C28D13B 301D0603 551D0E04 16041485
E4A85B35
 897A946C 6762C868 CD14CE4C 28D13B30 0D06092A 864886F7 0D010104
05000381
 810017D9 54EB7CF6 212D341A 2CBCF68E 405C249A A731E08D 36C10440
86ADEA56
 A7D02ED0 85F8E4EE 4025C2BA F324487C FD3861E3 2E246A4C 88AD8A72
54AD340D
 D854D9EE 66B67C74 3F038690 DF1EC1A7 6C82E8A2 508E4A95 91763E47
0088DD87
 61DB1824 573005E6 BF3BE8A3 00E9A29F C0A0D5AE 07D23AC0 49773F30
F9AC4F99 D82F
 quit
!
!
!
!
!
!
! Class maps for 1P7Q4T 10Gb ports service policy
 class-map type lan-queu match-any PRIORITY-QUEUE
  match dscp ef
  match dscp cs5
  match dscp cs4
 class-map type lan-queu match-any CONTROL-MGMT-QUEUE
  match dscp cs7
  match dscp cs6
  match dscp cs3
  match dscp cs2
 class-map type lan-queu match-any MULTIMEDIA-CONFERENCING-QUEUE
  match dscp af41 af42 af43
 class-map type lan-queu match-any MULTIMEDIA-STREAMING-QUEUE
  match dscp af31 af32 af33
 class-map type lan-queu match-any TRANSACTIONAL-DATA-QUEUE
  match dscp af21 af22 af23
 class-map type lan-queu match-any BULK-DATA-QUEUE
  match dscp af11 af12 af13
 class-map type lan-queu match-any SCAVENGER-QUEUE
  match dscp cs1
!
policy-map type lan-queuing 1P7Q4T
 class PRIORITY-QUEUE
  priority
  queue-limit percent 15
 class CONTROL-MGMT-QUEUE
  bandwidth remaining percent 10
  queue-limit percent 10
  random-detect dscp-based
  random-detect dscp 16 percent 60 70
  random-detect dscp-based
  random-detect dscp 24 percent 70 80
```

```
  random-detect dscp-based
  random-detect dscp 48 percent 80 90
  random-detect dscp-based
  random-detect dscp 56 percent 90 100
 class MULTIMEDIA-CONFERENCING-QUEUE
  bandwidth remaining percent 10
  queue-limit percent 10
  random-detect dscp-based
  random-detect dscp 38 percent 70 80
  random-detect dscp-based
  random-detect dscp 36 percent 80 90
  random-detect dscp-based
  random-detect dscp 34 percent 90 100
 class MULTIMEDIA-STREAMING-QUEUE
  bandwidth remaining percent 10
  queue-limit percent 10
  random-detect dscp-based
  random-detect dscp 30 percent 70 80
  random-detect dscp-based
  random-detect dscp 28 percent 80 90
  random-detect dscp-based
  random-detect dscp 26 percent 90 100
 class TRANSACTIONAL-DATA-QUEUE
  bandwidth remaining percent 10
  queue-limit percent 10
  random-detect dscp-based
  random-detect dscp 22 percent 70 80
  random-detect dscp-based
  random-detect dscp 20 percent 80 90
  random-detect dscp-based
  random-detect dscp 18 percent 90 100
 class BULK-DATA-QUEUE
  bandwidth remaining percent 4
  queue-limit percent 10
  random-detect dscp-based
  random-detect dscp 14 percent 70 80
  random-detect dscp-based
  random-detect dscp 12 percent 80 90
  random-detect dscp-based
  random-detect dscp 10 percent 90 100
 class class-default
  bandwidth remaining percent 25
  queue-limit percent 25
  random-detect dscp-based
  random-detect dscp 0 percent 80 100
 class SCAVENGER-QUEUE
  bandwidth remaining percent 1
  queue-limit percent 10
  random-detect dscp-based
  random-detect dscp 8 percent 80 100
!
! Class maps for 1P3Q8T 1Gb ports service policy
class-map type lan-queu match-any PRIORITY-QUEUE-GIG
 match cos 5 4
class-map type lan-queu match-any CONTROL-AND-STREAM-MEDIA
 match cos 7 6 3 2
class-map type lan-queu match-any BULK-DATA-SCAVENGER
 match cos 1
!
policy-map type lan-queuing 1P3Q8T
 class PRIORITY-QUEUE-GIG
  priority
  queue-limit percent 15
 class CONTROL-AND-STREAM-MEDIA
  bandwidth remaining 40
  queue-limit percent 40
  random-detect cos-based
  random-detect cos 2 percent 60 70
  random-detect cos-based
  random-detect cos 3 percent 70 80
  random-detect cos-based
  random-detect cos 6 percent 80 90
  random-detect cos-based
  random-detect cos 7 percent 90 100
```

```
 class class-default
  bandwidth remaining 25
  queue-limit percent 25
  random-detect cos-based
  random-detect cos 0 percent 80 100
 class BULK-DATA-SCAVENGER
  bandwidth remaining 5
  queue-limit percent 20
  random-detect cos-based
  random-detect cos 1 percent 80 100
!
macro name EgressQoSTenGig
  service-policy type lan-queuing output 1P7Q4T
@
!
macro name EgressQoSGig
  service-policy type lan-queuing output 1P3Q8T
@
!
!
spanning-tree mode rapid-pvst
diagnostic bootup level minimal
!
redundancy
 main-cpu
 auto-sync running-config
 mode sso
!
vlan internal allocation policy ascending
vlan access-log ratelimit 2000
!
!
!
interface Loopback0
 ip address 10.4.40.253 255.255.255.255
 ip pim sparse-mode
!
interface Loopback1
 ip address 10.4.40.252 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel35
 ip address 10.4.40.21 255.255.255.252
 ip pim sparse-mode
 logging event link-status
 mls qos trust dscp
!
interface Port-channel36
 ip address 10.4.40.25 255.255.255.252
 ip pim sparse-mode
 logging event link-status
 mls qos trust dscp
!
interface GigabitEthernet1/1
 no ip address
 logging event link-status
 logging event bundle-status
 macro description EgressQoSGig
 service-policy type lan-queuing output 1P3Q8T
 channel-protocol lacp
 channel-group 36 mode active
!
interface GigabitEthernet1/2
 no ip address
 logging event link-status
 logging event bundle-status
 macro description EgressQoSGig
 service-policy type lan-queuing output 1P3Q8T
 channel-protocol lacp
 channel-group 36 mode active
!
! ************************************************************
*******
! Interface GigabitEthernet 1/3 - 1/24 have been removed for
```

```
conciseness
! ************************************************************
*******
!
interface TenGigabitEthernet4/1
 no ip address
 logging event link-status
 logging event bundle-status
 channel-protocol lacp
 channel-group 35 mode active
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
!
interface TenGigabitEthernet4/2
 no ip address
 logging event link-status
 logging event bundle-status
 channel-protocol lacp
 channel-group 35 mode active
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
!
interface TenGigabitEthernet4/3
 no ip address
 shutdown
!
interface TenGigabitEthernet4/4
 no ip address
 shutdown
!
interface TenGigabitEthernet4/5
 ip address 10.4.40.29 255.255.255.252
 ip pim sparse-mode
 logging event link-status
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
!
interface TenGigabitEthernet4/6
 ip address 10.4.40.45 255.255.255.252
 ip pim sparse-mode
 logging event link-status
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
!
interface TenGigabitEthernet4/7
 ip address 10.4.40.49 255.255.255.252
 ip pim sparse-mode
 logging event link-status
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
!
interface TenGigabitEthernet4/8
 ip address 10.4.40.53 255.255.255.252
 ip pim sparse-mode
 logging event link-status
 macro description EgressQoSTenGig
 service-policy type lan-queuing output 1P7Q4T
!
interface GigabitEthernet5/1
 no ip address
 shutdown
!
interface GigabitEthernet5/2
 no ip address
 shutdown
!
interface GigabitEthernet5/3
 no ip address
 shutdown
!
interface TenGigabitEthernet5/4
 no ip address
 shutdown
!
```

```
interface TenGigabitEthernet5/5
 no ip address
 shutdown
!
interface Vlan1
 no ip address
 shutdown
!
!
router eigrp 100
 network 10.4.0.0 0.0.255.255
 eigrp router-id 10.4.40.253
 nsf
!
ip classless
!
!
no ip http server
ip http authentication aaa
ip http secure-server
ip pim autorp listener
ip pim send-rp-announce Loopback1 scope 32 group-list 10
ip pim send-rp-discovery Loopback0 scope 32
ip msdp peer 10.4.40.254 connect-source Loopback0
ip msdp cache-sa-state
ip msdp originator-id Loopback0
!
!
access-list 10 permit 239.1.0.0 0.0.255.255
snmp-server engineID local 8000000903000022BE737000
snmp-server community ******** RO
snmp-server community ******** RW
snmp-server trap-source Loopback1
tacacs-server host 10.4.48.15 key 7 04680E051D2458650C00
tacacs-server directed-request
!
!
control-plane
!
!
dial-peer cor custom
!
!
!
!
line con 0
 exec-timeout 30 0
line vty 0 4
 transport input ssh
line vty 5 15
 transport input ssh
!
!
ntp clock-period 17180049
ntp update-calendar
ntp server 10.4.48.17
mac-address-table aging-time 480
!
end
```

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