



Newer Design Guide Available

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

For up-to-date guidance on the designs described in this guide, see <http://cvddocs.com/fw/Aug13-215>

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





SBA

BORDERLESS
NETWORKS

CONFIGURATION
FILES

LAN Configuration Files Guide

SMART BUSINESS ARCHITECTURE

February 2013 Series

Preface

Who Should Read This Guide

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

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

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

Release Series

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

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

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

month year Series

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

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

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

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

How to Read Commands

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

Commands to enter at a CLI appear as follows:

```
configure terminal
```

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

```
ntp server 10.10.48.17
```

Commands with variables that you must define appear as follows:

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

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

```
Router# enable
```

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

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

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

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

Comments and Questions

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

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

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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.

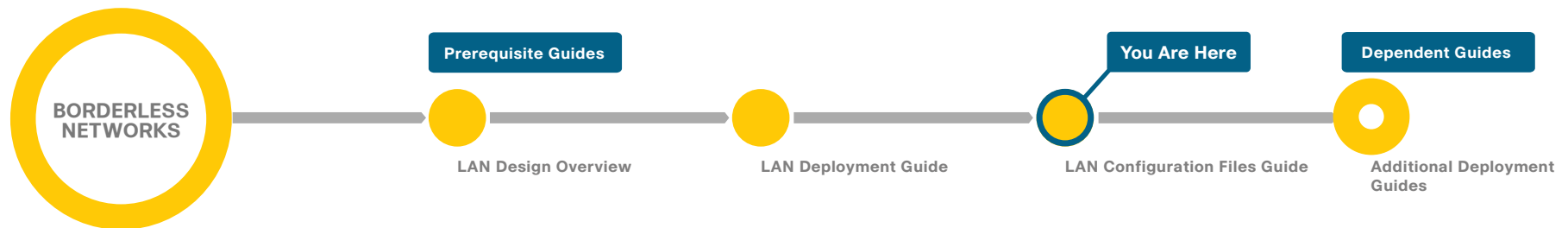
About This Guide

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>



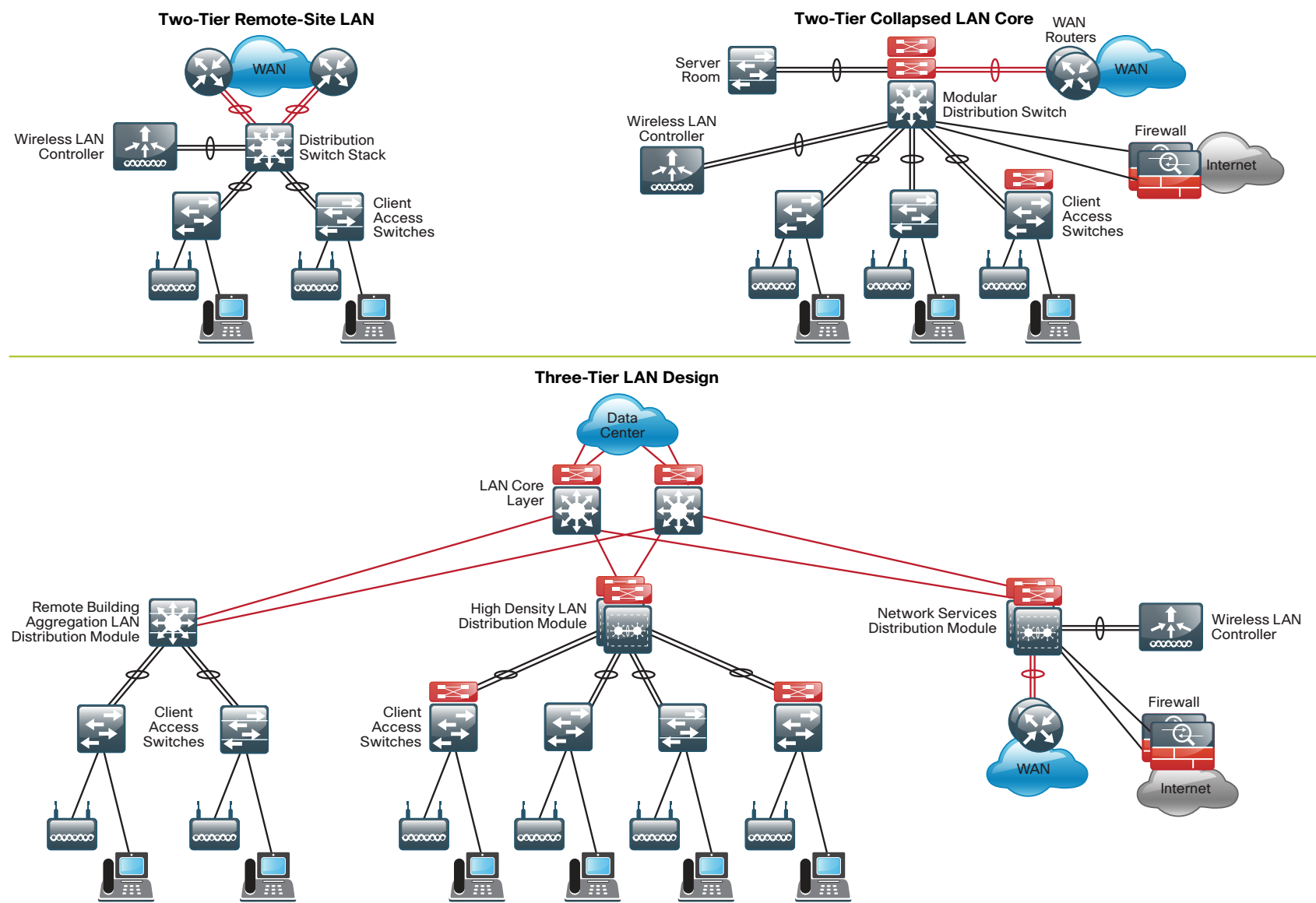
Introduction

The *Cisco SBA—Borderless Networks LAN Deployment Guide* provides an out-of-the-box deployment for wired network access with ubiquitous capabilities that scale from small environments with one to a few LAN switches to the larger campus-size LAN. Resiliency, security, and scalability are included to provide a robust communications environment. Quality of service (QoS) is integrated to ensure that the base architecture can support a multitude of applications including low latency, drop-sensitive, multimedia applications coexisting with data applications on a single network.

The Cisco SBA LAN architecture is designed to meet the needs of organizations with LAN connectivity requirements that range from a small remote-site LAN to up to 5,000 connected users at a single location.

Notes

Figure 1 - Cisco SBA scalable LAN architecture



2082

The modular design of the Cisco SBA LAN architecture provides multiple scale points to meet your organization's specific requirements:

- A highly resilient and scalable distribution layer with two modular chassis-based platforms using the Cisco Catalyst 6500 Virtual Switching System (VSS), that acts as a single logical distribution layer platform. This design allows for high density aggregation of Gigabit Ethernet and 10 Gigabit Ethernet connected wiring closets and other platforms. Cisco Catalyst 6500 VSS provides the most advanced feature set and the highest resiliency of the available platforms.
- A resilient modular chassis distribution layer design for locations where there is a mix of Gigabit Ethernet or 10-Gigabit Ethernet connected wiring closets that need to be aggregated. Cisco Catalyst 4507 with dual supervisors and dual power supplies provides resiliency with ISSU and sub-second failover.
- A stackable Cisco Catalyst 3750-X distribution layer switch to accommodate locations where there is a small number of gigabit connected wiring closets and other platforms that need to be aggregated. Cisco Catalyst 3750-X provides a resilient platform with StackWise and StackPower.
- A three tier network design that can accommodate the most demanding LAN requirements by incorporating one or many of the distribution layer designs connected to a highly reliable core layer. As the LAN design scales, the distribution layer modules that make up the design remain consistent to provide a scalable design.

In two-tier LAN designs where there is only an access layer and a single distribution layer, the distribution layer acts as a *collapsed core* as the distribution layer becomes the core for all connectivity in these locations.

Notes

Product List

LAN Access Layer

Functional Area	Product Description	Part Numbers	Software
Modular Access Layer Switch	Cisco Catalyst 4507R+E 7-slot Chassis with 48Gbps per slot	WS-C4507R+E	3.3.0.SG(15.1-1SG) IP Base license
	Cisco Catalyst 4500 E-Series Supervisor Engine 7L-E	WS-X45-SUP7L-E	
	Cisco Catalyst 4500 E-Series 48 Ethernet 10/100/1000 (RJ45) PoE+ ports	WS-X4648-RJ45V+E	
	Cisco Catalyst 4500 E-Series 48 Ethernet 10/100/1000 (RJ45) PoE+,UPoE ports	WS-X4748-UPOE+E	
Stackable Access Layer Switch	Cisco Catalyst 3750-X Series Stackable 48 Ethernet 10/100/1000 PoE+ ports	WS-C3750X-48PF-S	15.0(2)SE IP Base license
	Cisco Catalyst 3750-X Series Stackable 24 Ethernet 10/100/1000 PoE+ ports	WS-C3750X-24P-S	
	Cisco Catalyst 3750-X Series Two 10GbE SFP+ and Two GbE SFP ports network module	C3KX-NM-10G	
	Cisco Catalyst 3750-X Series Four GbE SFP ports network module	C3KX-NM-1G	
Standalone Access Layer Switch	Cisco Catalyst 3560-X Series Standalone 48 Ethernet 10/100/1000 PoE+ ports	WS-C3560X-48PF-S	15.0(2)SE IP Base license
	Cisco Catalyst 3560-X Series Standalone 24 Ethernet 10/100/1000 PoE+ ports	WS-C3560X-24P-S	
	Cisco Catalyst 3750-X Series Two 10GbE SFP+ and Two GbE SFP ports network module	C3KX-NM-10G	
	Cisco Catalyst 3750-X Series Four GbE SFP ports network module	C3KX-NM-1G	
Stackable Access Layer Switch	Cisco Catalyst 2960-S Series 48 Ethernet 10/100/1000 PoE+ ports and Two 10GbE SFP+ Uplink ports	WS-C2960S-48FPD-L	15.0(2)SE LAN Base license
	Cisco Catalyst 2960-S Series 48 Ethernet 10/100/1000 PoE+ ports and Four GbE SFP Uplink ports	WS-C2960S-48FPS-L	
	Cisco Catalyst 2960-S Series 24 Ethernet 10/100/1000 PoE+ ports and Two 10GbE SFP+ Uplink ports	WS-C2960S-24PD-L	
	Cisco Catalyst 2960-S Series 24 Ethernet 10/100/1000 PoE+ ports and Four GbE SFP Uplink ports	WS-C2960S-24PS-L	
	Cisco Catalyst 2960-S Series Flexstack Stack Module	C2960S-STACK	

LAN Distribution Layer

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

LAN Core Layer

Functional Area	Product Description	Part Numbers	Software
Modular Core Layer Switch	Cisco Catalyst 6500 E-Series 6-Slot Chassis	WS-C6506-E	15.0(1)SY1 IP services license
	Cisco Catalyst 6500 VSS Supervisor 2T with 2 ports 10GbE and PFC4	VS-S2T-10G	
	Cisco Catalyst 6500 24-port GbE SFP Fiber Module w/DFC4	WS-X6824-SFP-2T	
	Cisco Catalyst 6500 4-port 40GbE/16-port 10GbE Fiber Module w/DFC4	WS-X6904-40G-2T	
	Cisco Catalyst 6500 8-port 10GbE Fiber Module w/ DFC4	WS-X6908-10G-2T	

Access Layer Configurations

Catalyst 2960-S Series Switch

The Cisco Catalyst 2960-S Series switches are fixed-configuration, stack-able, 10/10/1000 Ethernet switches, with Power over Ethernet (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 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrs  
!  
username admin password 7 06055E324F41584B56  
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-c2960s-24pd-1  
switch 2 provision ws-c2960s-24ps-1  
switch 3 provision ws-c2960s-24pd-1  
stack-mac persistent timer 0  
ip arp inspection vlan 164-165  
!  
ip dhcp snooping vlan 164-165  
no ip dhcp snooping information option  
ip dhcp snooping  
ip domain-name cisco.local  
ip name-server 10.4.48.10  
vtp mode transparent  
udld enable  
!  
mls qos map policed-dscp 0 10 18 24 46 to 8  
mls qos map cos-dscp 0 8 16 24 32 46 48 56  
mls qos srr-queue output cos-map queue 1 threshold 3 4 5  
mls qos srr-queue output cos-map queue 2 threshold 1 2  
mls qos srr-queue output cos-map queue 2 threshold 2 3  
mls qos srr-queue output cos-map queue 2 threshold 3 6 7  
mls qos srr-queue output cos-map queue 3 threshold 3 0  
mls qos srr-queue output cos-map queue 4 threshold 3 1  
mls qos srr-queue output dscp-map queue 1 threshold 3 32 33 40 41  
42 43 44 45  
mls qos srr-queue output dscp-map queue 1 threshold 3 46 47  
mls qos srr-queue output dscp-map queue 2 threshold 1 16 17 18 19  
20 21 22 23  
mls qos srr-queue output dscp-map queue 2 threshold 1 26 27 28 29  
30 31 34 35  
mls qos srr-queue output dscp-map queue 2 threshold 1 36 37 38 39  
mls qos srr-queue output dscp-map queue 2 threshold 2 24  
mls qos srr-queue output dscp-map queue 2 threshold 3 48 49 50 51
```

```

52 53 54 55
mls qos srr-queue output dscp-map queue 2 threshold 3 56 57 58 59
60 61 62 63
mls qos srr-queue output dscp-map queue 3 threshold 3 0 1 2 3 4 5
6 7
mls qos srr-queue output dscp-map queue 4 threshold 1 8 9 11 13
15
mls qos srr-queue output dscp-map queue 4 threshold 2 10 12 14
mls qos queue-set output 1 threshold 1 100 100 50 200
mls qos queue-set output 1 threshold 2 125 125 100 400
mls qos queue-set output 1 threshold 3 100 100 100 3200
mls qos queue-set output 1 threshold 4 60 150 50 200
mls qos queue-set output 1 buffers 15 25 40 20
mls qos
!
crypto pki trustpoint TP-self-signed-1300546432
  enrollment selfsigned
  subject-name cn=IOS-Self-Signed-Certificate-1300546432
  revocation-check none
  rsakeypair TP-self-signed-1300546432
!
crypto pki certificate chain TP-self-signed-1300546432
  certificate self-signed 01
    3082022B 30820194 A0030201 02020101 300D0609 2A864886 F70D0101
05050030
    31312F30 2D060355 04031326 494F532D 53656C66 2D536967 6E65642D
43657274
    69666963 6174652D 31333030 35343634 3332301E 170D3933 30333031
30303032
    33325A17 0D323030 31303130 30303030 305A3031 312F302D 06035504
03132649
    4F532D53 656C662D 5369676E 65642D43 65727469 66696361 74652D31
33303035
    34363433 3230819F 300D0609 2A864886 F70D0101 01050003 818D0030
81890281
    8100C826 4A8657B8 76420D55 C5BDF1BC 52BA5F46 3F899EC0 1F972479
A6725101

```

```

899987ED AEF27CC9 16095D8E 962E056B 808BAE07 C001CB2F 6F48D332
6D9FDC2F
20225AFE 5BCB276E 94775625 25287002 CD4A5B13 BDF0E753 C9F65A77
CFCCDA88
F9A25E45 F7D89947 12C8F22D 3FD33BAA B2C4EFBD 0950E898 FD0A1C40
302953B2
BDF90203 010001A3 53305130 0F060355 1D130101 FF040530 030101FF
301F0603
551D2304 18301680 141AB5BD 2A97FF85 71278C1E 31C7DD68 986C77C5
8E301D06
03551D0E 04160414 1AB5BD2A 97FF8571 278C1E31 C7DD6898 6C77C58E
300D0609
2A864886 F70D0101 05050003 8181002F B57AB452 D3CD6E54 84F092BE
0533808D
C2139348 5E713D96 0E11141E EE7DACE1 485DA683 7BCE420B 2C463335
40D3F796
45D43516 FE588365 6DA02588 4D682481 A1D53EE1 3830623B B387AC43
18D87C73
EB6E81CF 3C0EF999 1639071C D456ADEF 2D2F8021 143F5F17 7EC9B540
13897139
44150603 C5C15479 AA33FA3F 60E559
quit
!
spanning-tree mode rapid-pvst
spanning-tree portfast bpduguard default
spanning-tree extend system-id
!
port-channel load-balance src-dst-ip
!
vlan internal allocation policy ascending
!
vlan 164
  name Data
!
vlan 165
  name Voice
!

```

```

vlan 179
  name Management
!
vlan 999
!
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
!
macro name AccessEdgeQoS
  auto qos voip cisco-phone
@
macro name EgressQoS
  mls qos trust dscp
  queue-set 1
  srr-queue bandwidth share 1 30 35 5
  priority-queue out
@
!

```

```

interface Port-channel1
  description EtherChannel link to Distribution Layer D4507
  switchport trunk native vlan 999
  switchport trunk allowed vlan 164,165,179
  switchport mode trunk
  ip arp inspection trust
  logging event link-status
  logging event trunk-status
  ip dhcp snooping trust
!
interface FastEthernet0
  no ip address
  shutdown
!
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
  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 1/0/2 - 1/0/24 are all configured
! the same as 1/0/1 and have been removed for conciseness
! *****
!
!
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
  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 GigabitEthernet1/0/3
  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
  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 GigabitEthernet1/0/4
  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
  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 GigabitEthernet1/0/5
  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
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 GigabitEthernet1/0/6
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
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 GigabitEthernet1/0/7
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
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 GigabitEthernet1/0/8
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
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 GigabitEthernet1/0/9
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
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 GigabitEthernet1/0/10
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

```

```

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 GigabitEthernet1/0/11
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
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 GigabitEthernet1/0/12
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
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 GigabitEthernet1/0/13
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
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 GigabitEthernet1/0/14

```

```

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
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 GigabitEthernet1/0/15
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
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 GigabitEthernet1/0/16
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
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 GigabitEthernet1/0/17
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
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 GigabitEthernet1/0/18
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
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 GigabitEthernet1/0/19
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
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 GigabitEthernet1/0/20
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
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 GigabitEthernet1/0/21
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
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 GigabitEthernet1/0/22
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
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 GigabitEthernet1/0/23
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
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 GigabitEthernet1/0/24
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
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 GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface TenGigabitEthernet1/0/1
description Link to D4507 Ten 1/1
switchport trunk native vlan 999
switchport trunk allowed vlan 164,165,179
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
priority-queue out
mls qos trust dscp
macro description EgressQoS
channel-protocol lacp
channel-group 1 mode active
ip dhcp snooping trust
!
interface TenGigabitEthernet1/0/2
!
interface GigabitEthernet2/0/1
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
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 2/0/2 - 2/0/24 are all configured
! the same as 2/0/1 and have been removed for conciseness
! *****
!
interface GigabitEthernet2/0/25
!
interface GigabitEthernet2/0/26
!
interface GigabitEthernet2/0/27
!
interface GigabitEthernet2/0/28
!
interface GigabitEthernet3/0/1
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
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 3/0/2 - 3/0/24 are all configured
! the same as 3/0/1 and have been removed for conciseness
! *****
!
interface GigabitEthernet3/0/25
!
interface GigabitEthernet3/0/26
!
interface TenGigabitEthernet3/0/1
description Link to D4507 Ten 2/1
switchport trunk native vlan 999
switchport trunk allowed vlan 164,165,179
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
priority-queue out
mls qos trust dscp
macro description EgressQoS
channel-protocol lacp
channel-group 1 mode active
ip dhcp snooping trust

```

```

!
interface TenGigabitEthernet3/0/2
!
interface Vlan1
  no ip address
  shutdown
!
interface Vlan179
  ip address 10.4.79.5 255.255.255.128
!
ip default-gateway 10.4.79.1
no ip http server
ip http authentication aaa
ip http secure-server
!
ip access-list extended AUTOQOS-ACL-DEFAULT
  permit ip any any
access-list 55 permit 10.4.48.0 0.0.0.255
snmp-server community cisco RO
snmp-server community cisco123 RW
tacacs server TACACS-SERVER-1
  address ipv4 10.4.48.15
  key 7 122A0014000E182F2F32
!
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 server 10.4.48.17
end

```

Catalyst 3750-X Series Switch

The Cisco Catalyst 3750-X Series switches are fixed-port, stackable, 10/100/1000 Ethernet switches, with PoE+ and non-PoE versions, that provide enhanced resiliency through the Cisco StackWise Plus and Cisco 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 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrsW
!
username admin password 7 094F1F1A1A0A464058
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-48p
switch 2 provision ws-c3750x-48p
switch 3 provision ws-c3750x-48p
stack-mac persistent timer 0

```

```

system mtu routing 1500
ip arp inspection vlan 102-103
!
ip dhcp snooping vlan 102-103
no ip dhcp snooping information option
ip dhcp snooping
ip domain-name cisco.local
ip name-server 10.4.48.10
vtp mode transparent
udld enable
!
mls qos map policed-dscp 0 10 18 24 46 to 8
mls qos map cos-dscp 0 8 16 24 32 46 48 56
mls qos srr-queue input bandwidth 70 30
mls qos srr-queue input threshold 1 80 90
mls qos srr-queue input priority-queue 2 bandwidth 30
mls qos srr-queue input cos-map queue 1 threshold 2 3
mls qos srr-queue input cos-map queue 1 threshold 3 6 7
mls qos srr-queue input cos-map queue 2 threshold 1 4
mls qos srr-queue input dscp-map queue 1 threshold 2 24
mls qos srr-queue input dscp-map queue 1 threshold 3 48 49 50 51
52 53 54 55
mls qos srr-queue input dscp-map queue 1 threshold 3 56 57 58 59
60 61 62 63
mls qos srr-queue input dscp-map queue 2 threshold 3 32 33 40 41
42 43 44 45
mls qos srr-queue input dscp-map queue 2 threshold 3 46 47
mls qos srr-queue output cos-map queue 1 threshold 3 4 5
mls qos srr-queue output cos-map queue 2 threshold 1 2
mls qos srr-queue output cos-map queue 2 threshold 2 3
mls qos srr-queue output cos-map queue 2 threshold 3 6 7
mls qos srr-queue output cos-map queue 3 threshold 3 0
mls qos srr-queue output cos-map queue 4 threshold 3 1
mls qos srr-queue output dscp-map queue 1 threshold 3 32 33 40 41
42 43 44 45
mls qos srr-queue output dscp-map queue 1 threshold 3 46 47

```

```

mls qos srr-queue output dscp-map queue 2 threshold 1 16 17 18 19
20 21 22 23
mls qos srr-queue output dscp-map queue 2 threshold 1 26 27 28 29
30 31 34 35
mls qos srr-queue output dscp-map queue 2 threshold 1 36 37 38 39
mls qos srr-queue output dscp-map queue 2 threshold 2 24
mls qos srr-queue output dscp-map queue 2 threshold 3 48 49 50 51
52 53 54 55
mls qos srr-queue output dscp-map queue 2 threshold 3 56 57 58 59
60 61 62 63
mls qos srr-queue output dscp-map queue 3 threshold 3 0 1 2 3 4 5
6 7
mls qos srr-queue output dscp-map queue 4 threshold 1 8 9 11 13
15
mls qos srr-queue output dscp-map queue 4 threshold 2 10 12 14
mls qos queue-set output 1 threshold 1 100 100 50 200
mls qos queue-set output 1 threshold 2 125 125 100 400
mls qos queue-set output 1 threshold 3 100 100 100 3200
mls qos queue-set output 1 threshold 4 60 150 50 200
mls qos queue-set output 1 buffers 15 25 40 20
mls qos
!
crypto pki trustpoint TP-self-signed-4271926272
enrollment selfsigned
subject-name cn=IOS-Self-Signed-Certificate-4271926272
revocation-check none
rsa-keypair TP-self-signed-4271926272
!
crypto pki certificate chain TP-self-signed-4271926272
certificate self-signed 01
3082022B 30820194 A0030201 02020101 300D0609 2A864886 F70D0101
05050030
31312F30 2D060355 04031326 494F532D 53656C66 2D536967 6E65642D
43657274
69666963 6174652D 34323731 39323632 3732301E 170D3933 30333031
30303031

```

```

35365A17 0D323030 31303130 30303030 305A3031 312F302D 06035504
03132649
4F532D53 656C662D 5369676E 65642D43 65727469 66696361 74652D34
32373139
32363237 3230819F 300D0609 2A864886 F70D0101 01050003 818D0030
81890281
8100E1F3 DCB5995F 1C8F0564 AF59CE51 16DADD51 C7E654DD 2F6F02BC
8598EAC1
FDF136E8 A7D35B08 93A3BECF 658C12B9 FBC2C398 AF6A6DC4 FB4FC747
FC8792E4
C2D31832 CF2ACDAD AE34CE45 F6976748 8B0DDA35 245BF526 3A4E7FD5
4690CBF7
5760842B BA10DA68 D80C1C6D 5E44F42D ADFC55A5 E12EF670 CC529103
5E5EFD46
917F0203 010001A3 53305130 0F060355 1D130101 FF040530 030101FF
301F0603
551D2304 18301680 14941021 9E93119E 21F77A81 81BB6A58 7668467F
C6301D06
03551D0E 04160414 9410219E 93119E21 F77A8181 BB6A5876 68467FC6
300D0609
2A864886 F70D0101 05050003 818100DC A6D628B2 AA7F51B8 FC527E90
A4355393
943451AF 873D5F18 507D0676 528ED8CB 7673EEEC 7EC3C000 B27BF76A
56A2E15D
214B7651 59883AEF 5734E99F 8F215681 BE5428E9 0897D3BD 54A369BF
A892D5DD
A61AA0AA A24E9CED 35ADF9DE A410A507 BA46392A 935A9261 18947EBA
59F8FB65
55E6F008 943FDD09 7A71F1E6 B8517E
quit
license boot level ipbase
license boot level ipbase switch 3
license boot level ipbase switch 1
!
spanning-tree mode rapid-pvst
spanning-tree portfast bpduguard default
spanning-tree extend system-id

```

```

!
port-channel load-balance src-dst-ip
!
vlan internal allocation policy ascending
!
vlan 102
name Data
!
vlan 103
name Voice
!
vlan 115
name Management
!
vlan 999
!
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 1000000 8000 exceed-action policed-dscp-transmit
!
macro name AccessEdgeQoS

```

```

auto qos voip cisco-phone
@
macro name EgressQoS
  mls qos trust dscp
  queue-set 1
  srr-queue bandwidth share 1 30 35 5
  priority-queue out
@
!
interface Port-channel2
  switchport trunk encapsulation dot1q
  switchport trunk native vlan 999
  switchport trunk allowed vlan 102,103,115
  switchport mode trunk
  ip arp inspection trust
  logging event link-status
  logging event trunk-status
  ip dhcp snooping trust
!
interface FastEthernet0
  no ip address
  shutdown
!
interface GigabitEthernet1/0/1
  switchport access vlan 102
  switchport mode access
  switchport voice vlan 103
  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
  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 1/0/2 - 1/0/48 are all configured
! the same as 1/0/1 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
  description Link to D6500VSS Ten 1/2/17
  switchport trunk encapsulation dot1q
  switchport trunk native vlan 999
  switchport trunk allowed vlan 102,103,115
  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
  priority-queue out
  mls qos trust dscp
macro description EgressQoS
channel-protocol lacp
channel-group 2 mode active
ip dhcp snooping trust

```

```

!
interface TenGigabitEthernet1/1/2
!
interface GigabitEthernet2/0/1
  switchport access vlan 102
  switchport mode access
  switchport voice vlan 103
  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
  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 2/0/2 - 2/0/48 are all configured
! the same as 2/0/1 and have been removed for conciseness
! *****
!
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
  switchport access vlan 102
  switchport mode access
  switchport voice vlan 103
  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
  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 3/0/2 - 3/0/48 are all configured
! the same as 3/0/1 and have been removed for conciseness
! *****
!
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 102,103,115
  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
  priority-queue out
  mls qos trust dscp
  macro description EgressQoS
  channel-protocol lacp
  channel-group 2 mode active
  ip dhcp snooping trust
!
interface TenGigabitEthernet3/1/2
!
interface Vlan1
  no ip address
  shutdown
!
interface Vlan115
  ip address 10.4.15.6 255.255.255.128
!
ip default-gateway 10.4.15.1
no ip http server
ip http authentication aaa
ip http secure-server
!
ip access-list extended AUTOQOS-ACL-DEFAULT
  permit ip any any
!
access-list 55 permit 10.4.48.0 0.0.0.255
snmp-server community cisco RO 55

```

```

snmp-server community cisco123 RW 55
tacacs server TACACS-SERVER-1
  address ipv4 10.4.48.15
  key 7 15210E0F162F3F0F2D2A
!
line con 0
line vty 0 4
  transport preferred none
  transport input ssh
line vty 5 15
  transport preferred none
  transport input ssh
!
ntp server 10.4.48.17
end

```

Catalyst 4500+E Series Switch

The Cisco Catalyst 4500 E-Series switches 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 that enables future functionality to be added with a supervisor module upgrade while maintaining the initial investment in the chassis and the modules.

```

!
version 15.1
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
service compress-config
!
hostname A4507
!
boot-start-marker
license boot level ipbase
boot-end-marker
!

```

```

no logging console
enable secret 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrsW
!
username admin password 7 094F1F1A1A0A464058
aaa new-model
!
aaa group server tacacs+ TACACS-SERVERS
    server name TACACS-SERVER-1
!
aaa group server radius ISE-Group
    server 10.4.48.41
    server 10.4.48.42
!
aaa authentication login default group TACACS-SERVERS local
aaa authentication dot1x default group ISE-Group
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
aaa authorization network default group ISE-Group
aaa authorization configuration default group ISE-Group
aaa accounting dot1x default start-stop group ISE-Group
!
aaa session-id common
clock timezone PST -8 0
clock summer-time PDT recurring
hw-module uplink select tengigabitethernet
udld enable
ip arp inspection vlan 100-101
!
ip vrf mgmtVrf
!
ip domain-name cisco.local
ip name-server 10.4.48.10
!
ip dhcp snooping vlan 100-101
no ip dhcp snooping information option
ip dhcp snooping
vtp mode transparent

```

```

!
crypto pki trustpoint TP-self-signed-14338
    enrollment selfsigned
    subject-name cn=IOS-Self-Signed-Certificate-14338
    revocation-check none
    rsakeypair TP-self-signed-14338
!
crypto pki certificate chain TP-self-signed-14338
    certificate self-signed 01
        30820221 3082018A A0030201 02020101 300D0609 2A864886 F70D0101
        05050030
        2C312A30 28060355 04031321 494F532D 53656C66 2D536967 6E65642D
        43657274
        69666963 6174652D 31343333 38301E17 0D313231 32313331 39323934
        365A170D
        32303031 30313030 30303030 5A302C31 2A302806 03550403 1321494F
        532D5365
        6C662D53 69676E65 642D4365 72746966 69636174 652D3134 33333830
        819F300D
        06092A86 4886F70D 01010105 0003818D 00308189 02818100 F8E2D409
        3265B79D
        C7CBE01D 30C1D818 6EA582B3 35394909 D52EE7D3 F6165889 79CEF5FA
        EE07720D
        03E10CCF 823D43A7 3145CC59 4AC2A979 46D4297D 69B98EDB 29C57222
        D42B295F
        7EDF6D45 17DC5588 21F35D7C B9CE1569 7C636C72 66190094 F7377D14
        2217EFD1
        EC466256 8629685C 662B1BBA F65DC8DA 9BF91BA8 AEB47F51 02030100
        01A35330
        51300F06 03551D13 0101FF04 05300301 01FF301F 0603551D 23041830
        16801402
        FDE038D5 4C781D46 9319B68F 950BD038 4003FB30 1D060355 1D0E0416
        041402FD
        E038D54C 781D4693 19B68F95 0BD03840 03FB300D 06092A86 4886F70D
        01010505
        00038181 000C3AC7 4740185E B4A90C4D 700B6D1E 73F6C9A1 3187BF53
        13DC3BF2

```

```

A4B8B451 7C958D6A 4BFAAD7B 43DE99C4 C57BEF74 082AA316 BDADC9D8
066AC05A
AA50366F 5E691B60 8A4E6975 DB3D38C4 76083CF3 F90244C3 3BD20ED6
30425088
D14C78BE A316C869 9D6AFDCC FD953C1A B124089C AB31F5CB D2821E52
B8309F57
EB2912CA 32
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 Data
!
vlan 101
name Voice
!
vlan 115
name Mgmt
!
vlan 999
!
ip ssh version 2
!
class-map match-any MULTIMEDIA-STREAMING-QUEUE
match dscp af31 af32 af33
class-map match-all AutoQos-4.0-Scavenger-Classify
match access-group name AutoQos-4.0-ACL-Scavenger
class-map match-all AutoQos-4.0-Signaling-Classify

```

```

match access-group name AutoQos-4.0-ACL-Signaling
class-map match-any CONTROL-MGMT-QUEUE
match dscp cs7
match dscp cs6
match dscp cs3
match dscp cs2
class-map match-any AutoQos-4.0-Priority-Queue
match cos 5
match dscp ef
match dscp cs5
match dscp cs4
class-map match-all AutoQos-4.0-VoIP-Data-Cos
match cos 5
class-map match-any TRANSACTIONAL-DATA-QUEUE
match dscp af21 af22 af23
class-map match-any AutoQos-4.0-Multimedia-Stream-Queue
match dscp af31
match dscp af32
match dscp af33
class-map match-all AutoQos-4.0-VoIP-Signal-Cos
match cos 3
class-map match-any AutoQos-4.0-Multimedia-Conf-Queue
match cos 4
match dscp af41
match dscp af42
match dscp af43
match access-group name AutoQos-4.0-ACL-Multimedia-Conf
class-map match-all AutoQos-4.0-Default-Classify
match access-group name AutoQos-4.0-ACL-Default
class-map match-any AutoQos-4.0-Bulk-Data-Queue
match cos 1
match dscp af11
match dscp af12
match dscp af13
match access-group name AutoQos-4.0-ACL-Bulk-Data
class-map match-all AutoQos-4.0-Transaction-Classify
match access-group name AutoQos-4.0-ACL-Transactional-Data

```

```

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 AutoQos-4.0-Scavenger-Queue
  match dscp cs1
  match cos 1
  match access-group name AutoQos-4.0-ACL-Scavenger
class-map match-any AutoQos-4.0-Control-Mgmt-Queue
  match cos 3
  match dscp cs7
  match dscp cs6
  match dscp cs3
  match dscp cs2
  match access-group name AutoQos-4.0-ACL-Signaling
class-map match-any PRIORITY-QUEUE
  match dscp ef
  match dscp cs5
  match dscp cs4
class-map match-all AutoQos-4.0-Bulk-Data-Classify
  match access-group name AutoQos-4.0-ACL-Bulk-Data
class-map match-any AutoQos-4.0-Trans-Data-Queue
  match cos 2
  match dscp af21
  match dscp af22
  match dscp af23
  match access-group name AutoQos-4.0-ACL-Transactional-Data
class-map match-any AutoQos-4.0-VoIP-Data
  match dscp ef
  match cos 5
class-map match-all AutoQos-4.0-Multimedia-Conf-Classify
  match access-group name AutoQos-4.0-ACL-Multimedia-Conf
class-map match-any AutoQos-4.0-VoIP-Signal
  match dscp cs3
  match cos 3

```

```

!
policy-map AutoQos-4.0-Cisco-Phone-Input-Policy
  class AutoQos-4.0-VoIP-Data-Cos
    set dscp ef
    police cir 128000 bc 8000
      exceed-action set-dscp-transmit cs1
      exceed-action set-cos-transmit 1
  class AutoQos-4.0-VoIP-Signal-Cos
    set dscp cs3
    police cir 32000 bc 8000
      exceed-action set-dscp-transmit cs1
      exceed-action set-cos-transmit 1
  class class-default
    set dscp default
    set cos 0
policy-map AutoQos-4.0-Output-Policy
  class AutoQos-4.0-Scavenger-Queue
    bandwidth remaining percent 1
  class AutoQos-4.0-Priority-Queue
    priority
    police cir percent 30 bc 33 ms
  class AutoQos-4.0-Control-Mgmt-Queue
    bandwidth remaining percent 10
  class AutoQos-4.0-Multimedia-Conf-Queue
    bandwidth remaining percent 10
  class AutoQos-4.0-Multimedia-Stream-Queue
    bandwidth remaining percent 10
  class AutoQos-4.0-Trans-Data-Queue
    bandwidth remaining percent 10
    dbl
  class AutoQos-4.0-Bulk-Data-Queue
    bandwidth remaining percent 4
    dbl
  class class-default
    bandwidth remaining percent 25
    dbl
policy-map 1P7Q1T

```

```

class PRIORITY-QUEUE
    priority
class CONTROL-MGMT-QUEUE
    bandwidth remaining percent 10
class MULTIMEDIA-CONFERENCING-QUEUE
    bandwidth remaining percent 10
class MULTIMEDIA-STREAMING-QUEUE
    bandwidth remaining percent 10
class TRANSACTIONAL-DATA-QUEUE
    bandwidth remaining percent 10
    dbl
class BULK-DATA-QUEUE
    bandwidth remaining percent 4
    dbl
class SCAVENGER-QUEUE
    bandwidth remaining percent 1
class class-default
    bandwidth remaining percent 25
    dbl
!
macro name AccessEdgeQoS
    auto qos voip cisco-phone
@
macro name EgressQoS
    service-policy output 1P7Q1T
@
!
interface Port-channel1
    description Etherchannel Link to D6500VSS
    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
    flowcontrol receive on

    ip dhcp snooping trust
    !
interface Port-channel7
    description EtherChannel Link to Compact Switch
    switchport
    switchport trunk native vlan 999
    switchport trunk allowed vlan 100,101,115
    switchport mode trunk
    ip arp inspection trust
    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
    auto qos voip cisco-phone
    qos trust device cisco-phone
    macro description AccessEdgeQoS
    spanning-tree portfast
    service-policy input AutoQos-4.0-Cisco-Phone-Input-Policy
    service-policy output AutoQos-4.0-Output-Policy
    ip verify source vlan dhcp-snooping
    ip dhcp snooping limit rate 100
    !

```

```

! *****
! Interface GigabitEthernet 1/2 - 1/48 are all configured
! the same as 1/1 and have been removed for conciseness
! *****
!
interface GigabitEthernet2/1
  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
  auto qos voip cisco-phone
  qos trust device cisco-phone
  macro description AccessEdgeQoS
  spanning-tree portfast
  service-policy input AutoQos-4.0-Cisco-Phone-Input-Policy
  service-policy output AutoQos-4.0-Output-Policy
  ip verify source vlan dhcp-snooping
  ip dhcp snooping limit rate 100
!
! *****
! Interface GigabitEthernet 2/2 - 2/48 are all configured
! the same as 2/1 and have been removed for conciseness
! *****
!
interface TenGigabitEthernet3/1
  description Link to D6500VSS Ten 1/2/13
  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
  description Link to D6500VSS Ten 2/2/13
  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 GigabitEthernet3/3
!
interface GigabitEthernet3/4
!
interface GigabitEthernet3/5
!
interface GigabitEthernet3/6
!
interface GigabitEthernet5/1
  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
auto qos voip cisco-phone
qos trust device cisco-phone
macro description AccessEdgeQoS
spanning-tree portfast
service-policy input AutoQos-4.0-Cisco-Phone-Input-Policy
service-policy output AutoQos-4.0-Output-Policy
ip verify source vlan dhcp-snooping
ip dhcp snooping limit rate 100
!
! *****
! Interface GigabitEthernet 5/2 - 5/47 are all configured
! the same as 5/1 and have been removed for conciseness
! *****
!
interface GigabitEthernet5/48
description Link to Compact Switch port 1
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 7 mode active
service-policy output 1P7Q1T
ip dhcp snooping trust
!
interface GigabitEthernet6/1
!
! *****
! Interface GigabitEthernet 6/2 - 6/47 are all configured
! the same as 6/1 and have been removed for conciseness
! *****
!
interface GigabitEthernet6/48

```

```

description Link to Compact Switch port 2
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 7 mode active
service-policy output 1P7Q1T
ip dhcp snooping trust
!
interface Vlan1
no ip address
!
interface Vlan115
ip address 10.4.15.5 255.255.255.128
!
no ip http server
ip http authentication aaa
ip http secure-server
ip route 0.0.0.0 0.0.0.0 10.4.15.1
!
ip access-list extended AutoQos-4.0-ACL-Bulk-Data
permit tcp any any eq ftp
permit tcp any any eq ftp-data
permit tcp any any eq 22
permit tcp any any eq smtp
permit tcp any any eq 465
permit tcp any any eq 143
permit tcp any any eq 993
permit tcp any any eq pop3
permit tcp any any eq 995
permit tcp any any eq 1914
ip access-list extended AutoQos-4.0-ACL-Default
permit ip any any

```

```

ip access-list extended AutoQos-4.0-ACL-Multimedia-Conf
  permit udp any any range 16384 32767
ip access-list extended AutoQos-4.0-ACL-Scavenger
  permit tcp any any eq 1214
  permit udp any any eq 1214
  permit tcp any any range 2300 2400
  permit udp any any range 2300 2400
  permit tcp any any eq 3689
  permit udp any any eq 3689
  permit tcp any any range 6881 6999
  permit tcp any any eq 11999
  permit tcp any any range 28800 29100
ip access-list extended AutoQos-4.0-ACL-Signaling
  permit tcp any any range 2000 2002
  permit tcp any any range 5060 5061
  permit udp any any range 5060 5061
ip access-list extended AutoQos-4.0-ACL-Transactional-Data
  permit tcp any any eq 443
  permit tcp any any eq 1521
  permit udp any any eq 1521
  permit tcp any any eq 1526
  permit udp any any eq 1526
  permit tcp any any eq 1575
  permit udp any any eq 1575
  permit tcp any any eq 1630
  permit udp any any eq 1630
!
logging 10.4.48.35
logging 10.4.48.38
logging 10.4.48.39
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 host 10.4.48.38 cisco
snmp-server host 10.4.48.35 cisco123
snmp-server host 10.4.48.39 cisco123

```

```

tacacs server TACACS-SERVER-1
  address ipv4 10.4.48.15
  key 7 04680E051D2458650C00
radius-server host 10.4.48.41
radius-server host 10.4.48.42
radius-server key 7 142417081E013E002131
radius-server vsa send accounting
radius-server vsa send authentication
!
line con 0
  stopbits 1
line vty 0 4
  length 0
  transport preferred none
  transport input ssh
line vty 5 15
  length 0
  transport preferred none
  transport input ssh
!
ntp update-calendar
ntp server 10.4.48.17
end

```

Distribution Layer Configurations

Catalyst 3750X-12S Switch

The Catalyst 3750X-12S switch is configured as a single unit, but has independent load-sharing power supplies and processor for each switch in the Cisco StackWise Plus stack. The Cisco SBA LAN architecture uses a pair of stacked 3750X-12S-E switches that provide Layer 2 and Layer 3 switching for a small to medium density of Gigabit Ethernet access-closet support. The switches use Small Form-Factor Pluggable (SFP) transceivers 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 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhXTZyUnZdsSrs  
!  
username admin password 7 011057175804575D72  
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-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 name-server 10.4.48.10  
ip multicast-routing distributed  
vtp mode transparent  
udld enable  
!  
mls qos map policed-dscp 0 10 18 24 46 to 8  
mls qos map cos-dscp 0 8 16 24 32 46 48 56  
mls qos srr-queue input bandwidth 70 30  
mls qos srr-queue input threshold 1 80 90  
mls qos srr-queue input priority-queue 2 bandwidth 30  
mls qos srr-queue input cos-map queue 1 threshold 2 3  
mls qos srr-queue input cos-map queue 1 threshold 3 6 7  
mls qos srr-queue input cos-map queue 2 threshold 1 4  
mls qos srr-queue input dscp-map queue 1 threshold 2 24  
mls qos srr-queue input dscp-map queue 1 threshold 3 48 49 50 51  
52 53 54 55  
mls qos srr-queue input dscp-map queue 1 threshold 3 56 57 58 59  
60 61 62 63  
mls qos srr-queue input dscp-map queue 2 threshold 3 32 33 40 41  
42 43 44 45
```

```

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

```

```

!
vlan 180
    name Data
!
vlan 181
    name Voice
!
vlan 195
    name Management
!
vlan 999
!
ip ssh source-interface Loopback0
!
macro name EgressQoS
    mls qos trust dscp
    queue-set 1
    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 EtherChanne link to A2960S-D3K
    switchport trunk encapsulation dot1q
    switchport trunk native vlan 999
    switchport trunk allowed vlan 180,181,195
    switchport mode trunk
!
interface Port-channel32
    description Link to Core C6506-1
    no switchport
    ip address 10.4.40.26 255.255.255.252
    ip pim sparse-mode

```

```

ip summary-address eigrp 100 10.4.80.0 255.255.240.0
logging event link-status
carrier-delay msec 0
!
interface Port-channel33
description Link to Core C6506-2
no switchport
ip address 10.4.40.30 255.255.255.252
ip pim sparse-mode
ip summary-address eigrp 100 10.4.80.0 255.255.240.0
logging event link-status
carrier-delay msec 0
!
interface FastEthernet0
no ip address
no ip route-cache
shutdown
!
interface GigabitEthernet1/0/1
description Link to 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
priority-queue out
mls qos trust dscp
macro description EgressQoS
channel-protocol lacp
channel-group 1 mode active
!
interface GigabitEthernet1/0/2
description Link to A2960S Gig 4/0/25
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
priority-queue out
mls qos trust dscp
macro description EgressQoS
channel-protocol lacp
channel-group 1 mode active
!
interface GigabitEthernet1/0/3
shutdown
!
! *****
! Interface GigabitEthernet 1/0/4 - 1/0/12 are all configured
! the same as 1/0/3 and have been removed for conciseness
! *****
!
interface GigabitEthernet1/1/1
description Link to C6506-1 Gig 1/1
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
priority-queue out
mls qos trust dscp
macro description EgressQoS
channel-protocol lacp
channel-group 32 mode active
!
interface GigabitEthernet1/1/2

```

```

description Link to C6506-1 Gig 1/2
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
priority-queue out
mls qos trust dscp
macro description EgressQoS
channel-protocol lacp
channel-group 32 mode active
!
interface GigabitEthernet1/1/3
description Link to C6506-2 Gig 1/1
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
priority-queue out
mls qos trust dscp
macro description EgressQoS
channel-protocol lacp
channel-group 33 mode active
!
interface GigabitEthernet1/1/4
description Link to C6506-2 Gig 1/2
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
priority-queue out
mls qos trust dscp
macro description EgressQoS
channel-protocol lacp
channel-group 33 mode active
!
interface TenGigabitEthernet1/1/1
!
interface TenGigabitEthernet1/1/2
!
interface GigabitEthernet2/0/1
shutdown
!
! *****
! Interface GigabitEthernet 2/0/2 - 2/0/12 are all configured
! the same as 2/0/1 and have been removed for conciseness
! *****
!
interface GigabitEthernet2/1/1
shutdown
!
interface GigabitEthernet2/1/2
shutdown
!
interface GigabitEthernet2/1/3
shutdown
!
interface GigabitEthernet2/1/4
shutdown
!
interface TenGigabitEthernet2/1/1
!
interface TenGigabitEthernet2/1/2
!
interface GigabitEthernet3/0/1
description Link to A2960S Gig 1/0/26

```

```

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
priority-queue out
mls qos trust dscp
macro description EgressQoS
channel-protocol lacp
channel-group 1 mode active
!
interface GigabitEthernet3/0/2
description Link to A2960S Gig 4/0/26
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
priority-queue out
mls qos trust dscp
macro description EgressQoS
channel-protocol lacp
channel-group 1 mode active
!
interface GigabitEthernet3/0/3
shutdown
!

```

```

! *****
! Interface GigabitEthernet 3/0/4 - 3/0/12 are all configured
! the same as 3/0/3 and have been removed for conciseness
! *****
!
interface GigabitEthernet3/1/1
description Link to C6506-1 Gig 1/3
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
priority-queue out
mls qos trust dscp
macro description EgressQoS
channel-protocol lacp
channel-group 32 mode active
!
interface GigabitEthernet3/1/2
description Link to C6506-1 Gig 1/4
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
priority-queue out
mls qos trust dscp
macro description EgressQoS
channel-protocol lacp
channel-group 32 mode active
!
interface GigabitEthernet3/1/3
description Link to C6506-2 Gig 1/3

```

```

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
priority-queue out
mls qos trust dscp
macro description EgressQoS
channel-protocol lacp
channel-group 33 mode active
!
interface GigabitEthernet3/1/4
description Link to C6506-2 Gig 1/4
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
priority-queue out
mls qos trust dscp
macro description EgressQoS
channel-protocol lacp
channel-group 33 mode active
!
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
!
router eigrp 100
network 10.4.0.0 0.1.255.255
passive-interface default
no passive-interface Port-channel33
no passive-interface Port-channel32
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
!
snmp-server trap-source Loopback0
tacacs server TACACS-SERVER-1
address ipv4 10.4.48.15
key 7 122A0014000E182F2F32
!
line con 0
line vty 5 15
!
ntp source Loopback0
ntp server 10.4.48.17
end

```

Catalyst 4507R+E Switch

The Cisco Catalyst 4507R+E switch has redundant supervisors, line cards, and power supplies. This design uses 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 15.1
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
service compress-config
!
hostname D4507
!
boot-start-marker
boot-end-marker
!
enable secret 4 /DtCCr53Q4B18jSImlUEqu7cNVZTOhxTZyUnZdsSrs
!
username admin password 7 08221D5D0A16544541
aaa new-model
!
aaa group server tacacs+ TACACS-SERVERS
server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
aaa session-id common
clock timezone PST -8 0
clock summer-time PDT recurring
udld enable
!
ip vrf mgmtVrf
!
```

```
ip multicast-routing
ip domain-name cisco.local
ip name-server 10.4.48.10
!
vtp mode transparent
!
crypto pki trustpoint CISCO_IDEVID_SUDI
revocation-check none
rsakeypair CISCO_IDEVID_SUDI
!
crypto pki trustpoint CISCO_IDEVID_SUDI0
revocation-check none
!
crypto pki trustpoint TP-self-signed-14338
enrollment selfsigned
subject-name cn=IOS-Self-Signed-Certificate-14338
revocation-check none
rsakeypair TP-self-signed-14338
!
crypto pki certificate chain CISCO_IDEVID_SUDI
certificate 6A0FAF0000000015F299
30820452 3082033A A0030201 02020A6A 0FAF0000 000015F2 99300D06
092A8648
86F70D01 01050500 30393116 30140603 55040A13 0D436973 636F2053
79737465
6D73311F 301D0603 55040313 16436973 636F204D 616E7566 61637475
72696E67
20434130 1E170D31 30313231 32313631 3133355A 170D3230 31323132
31363231
33355A30 50312930 27060355 04051320 5049443A 57532D58 34352D53
5550372D
4520534E 3A434154 31343530 4C323134 31233021 06035504 03131A57
532D5834
352D5355 50372D45 2D303032 36306237 39616562 63308201 22300D06
092A8648
86F70D01 01010500 0382010F 00308201 0A028201 0100C33B 3E2A9418
ECF4ACC8
```

7B971B7D 67710103 F4CF432B A7173B83 DE14CC01 117BB807 21DBAF6C
 FA87CE72
 4E99E07F C7855B29 2D139ADB 8D4BB6FF 3C28CF14 C19A85F1 249541FD
 34BE69AF
 1740C0C7 21024B85 0F99AC0C BFC1AABE 8278D878 D5997F84 2BB39433
 FEC871A4
 225BB918 A8513FB4 E134C99E E45D37CE 0CA0F657 7347B27A F8ED00FC
 1704EA9C
 4B5BDD75 0797D71C 58DAAD50 0ADB6046 901CDC8E A17A800E D5B85139
 786F66FA
 76A92D49 1178033C A39D46BF 2CF6A752 C79B55F4 C9D6BC48 4A10AB6F
 387EC749
 08F746C4 FCDC3111 220F7CC4 B78852A9 0151AAFD 208DE32D 0A11E328
 37F4FBF2
 58DFE31A 6487888B E5D5F19F 98AB2370 3541FF78 ABCF0203 010001A3
 82014330
 82013F30 0E060355 1D0F0101 FF040403 0204F030 1D060355 1D250416
 30140608
 2B060105 05070301 06082B06 01050507 0302301D 0603551D 0E041604
 14297197
 90DD8ADE A8AAFF87 A0722562 E63595D3 4D301F06 03551D23 04183016
 8014D0C5
 2226AB4F 4660ECAE 0591C7DC 5AD1B047 F76C303F 0603551D 1F043830
 363034A0
 32A03086 2E687474 703A2F2F 7777772E 63697363 6F2E636F 6D2F7365
 63757269
 74792F70 6B692F63 726C2F63 6D63612E 63726C30 4C06082B 06010505
 07010104
 40303E30 3C06082B 06010505 07300286 30687474 703A2F2F 7777772E
 63697363
 6F2E636F 6D2F7365 63757269 74792F70 6B692F63 65727473 2F636D63
 612E6365
 72303F06 092B0601 04018237 14020432 1E300049 00500053 00450043
 0049006E
 00740065 0072006D 00650064 00690061 00740065 004F0066 0066006C
 0069006E
 0065300D 06092A86 4886F70D 01010505 00038201 01000BEE BA40FB3D

5BFBDECC
 454CCE86 AB8B0B63 9BA4153D A3418320 6FB30AEA C6DF987B 07933654
 51DC6DCE
 A0B94ACE F8B981D9 DC64D070 CBA0C658 657DC855 02C20B8D 1AC5A308
 861858F8
 D3FE90B8 F1D05B63 DCBF0C79 65F45993 D1EDE0BD 3E3F579F 778F342D
 B805B605
 BD2ADD4E 046F2605 470A8C63 4CD0AAC6 9767E7BC B82B0F01 DBC81E1A
 BE60F094
 C2A35750 F5A0ABA6 FA99F683 A20B676B C4753F35 15B6156D BBAFE30F
 CE26C31B
 3A394EAD 40A44B4F 1EF06F09 194C237E F6909DBA DAF8B535 1BB305BE
 7D168FFD
 80B99E23 29DA022A F9CCB328 2CF4B443 E5385E79 29E274B5 44D93FC6
 9527F25D
 303DAAFA 105331B2 01C612FD 35CB61C2 D69A561E 5461
 quit
 certificate ca 6A6967B30000000000003
 308204D9 308203C1 A0030201 02020A6A 6967B300 00000000 03300D06
 092A8648
 86F70D01 01050500 30353116 30140603 55040A13 0D436973 636F2053
 79737465
 6D73311B 30190603 55040313 12436973 636F2052 6F6F7420 43412032
 30343830
 1E170D30 35303631 30323231 3630315A 170D3239 30353134 32303235
 34325A30
 39311630 14060355 040A130D 43697363 6F205379 7374656D 73311F30
 1D060355
 04031316 43697363 6F204D61 6E756661 63747572 696E6720 43413082
 0120300D
 06092A86 4886F70D 01010105 00038201 0D003082 01080282 010100A0
 C5F7DC96
 943515F1 F4994EBB 9B41E17D DB791691 BBF354F2 414A9432 6262C923
 F79AE7BB
 9B79E807 294E30F5 AE1BC521 5646B0F8 F4E68E81 B816CCA8 9B85D242
 81DB7CCB

94A91161 121C5CEA 33201C9A 16A77DDB 99066AE2 36AFECF8 0AFF9867
07F430EE
A5F8881A AAE8C73C 1CCEEE48 FDCD5C37 F186939E 3D71757D 34EE4B14
A9C0297B
0510EF87 9E693130 F548363F D8ABCE15 E2E8589F 3E627104 8726A415
620125AA
D5DFC9C9 5BB8C9A1 077BBE68 92939320 A86CBD15 75D3445D 454BECA8
DA60C7D8
C8D5C8ED 41E1F55F 578E5332 9349D5D9 0FF836AA 07C43241 C5A7AF1D
19FFF673
99395A73 67621334 0D1F5E95 70526417 06EC535C 5CDB6AEA 35004102
0103A382
01E73082 01E33012 0603551D 130101FF 04083006 0101FF02 0100301D
0603551D
0E041604 14D0C522 26AB4F46 60ECAE05 91C7DC5A D1B047F7 6C300B06
03551D0F
04040302 01863010 06092B06 01040182 37150104 03020100 30190609
2B060104
01823714 02040C1E 0A005300 75006200 43004130 1F060355 1D230418
30168014
27F3C815 1E6E9A02 0916AD2B A089605F DA7B2FAA 30430603 551D1F04
3C303A30
38A036A0 34863268 7474703A 2F2F7777 772E6369 73636F2E 636F6D2F
73656375
72697479 2F706B69 2F63726C 2F637263 61323034 382E6372 6C305006
082B0601
05050701 01044430 42304006 082B0601 05050730 02863468 7474703A
2F2F7777
772E6369 73636F2E 636F6D2F 73656375 72697479 2F706B69 2F636572
74732F63
72636132 3034382E 63657230 5C060355 1D200455 30533051 060A2B06
01040109
15010200 30433041 06082B06 01050507 02011635 68747470 3A2F2F77
77772E63
6973636F 2E636F6D 2F736563 75726974 792F706B 692F706F 6C696369
65732F69

6E646578 2E68746D 6C305E06 03551D25 04573055 06082B06 01050507
03010608
2B060105 05070302 06082B06 01050507 03050608 2B060105 05070306
06082B06
01050507 0307060A 2B060104 0182370A 0301060A 2B060104 01823714
02010609
2B060104 01823715 06300D06 092A8648 86F70D01 01050500 03820101
0030F330
2D8CF2CA 374A6499 24290AF2 86AA42D5 23E8A2EA 2B6F6923 7A828E1C
4C09CFA4
4FAB842F 37E96560 D19AC6D8 F30BF5DE D027005C 6F1D91BD D14E5851
1DC9E3F7
38E7D30B D168BE8E 22A54B06 E1E6A4AA 337D1A75 BA26F370 C66100A5
C379265B
A719D193 8DAB9B10 11291FA1 82FDFD3C 4B6E65DC 934505E9 AF336B67
23070686
22DAEBDC 87CF5921 421AE9CF 707588E0 243D5D7D 4E963880 97D56FF0
9B71D8BA
6019A5B0 6186ADDD 6566F6B9 27A2EE2F 619BBAA1 3061FDBE AC3514F9
B82D9706
AFC3EF6D CC3D3CEB 95E981D3 8A5EB6CE FA79A46B D7A25764 C43F4CC9
DBE882EC
0166D410 88A256E5 3C57EDE9 02A84891 6307AB61 264B1A13 9FE4DCDA
5F
 quit
 crypto pki certificate chain CISCO_IDEVID_SUDI0
 certificate ca 5FF87B282B54DC8D42A315B568C9ADFF
30820343 3082022B A0030201 0202105F F87B282B 54DC8D42 A315B568
C9ADFF30
0D06092A 864886F7 0D010105 05003035 31163014 06035504 0A130D43
6973636F
20537973 74656D73 311B3019 06035504 03131243 6973636F 20526F6F
74204341
20323034 38301E17 0D303430 35313432 30313731 325A170D 32393035
31343230
32353432 5A303531 16301406 0355040A 130D4369 73636F20 53797374
656D7331

1B301906 03550403 13124369 73636F20 526F6F74 20434120 32303438
30820120
300D0609 2A864886 F70D0101 01050003 82010D00 30820108 02820101
00B09AB9
ABA7AF0A 77A7E271 B6B46662 94788847 C6625584 4032BFC0 AB2EA51C
71D6BC6E
7BA8AABA 6ED21588 48459DA2 FC83D0CC B98CE026 68704A78 DF21179E
F46105C9
15C8CF16 DA356189 9443A884 A8319878 9BB94E6F 2C53126C CD1DAD2B
24BB31C4
2BFF8344 6FB63D24 7709EABF 2AA81F6A 56F6200F 11549781 75A725CE
596A8265
EFB7EAE7 E28D758B 6EF2DD4F A65E629C CF100A64 D04E6DCE 2BCC5BF5
60A52747
8D69F47F CE1B70DE 701B20D6 6ECDA601 A83C12D2 A93FA06B 5EBB8E20
8B7A91E3
B568EEA0 E7C40174 A8530B2B 4A9A0F65 120E824D 8E63FDEF EB9B1ADB
53A61360
AFC27DD7 C76C1725 D473FB47 64508180 944CE1BF AE4B1CDF 92ED2E05
DF020103
A351304F 300B0603 551D0F04 04030201 86300F06 03551D13 0101FF04
05300301
01FF301D 0603551D 0E041604 1427F3C8 151E6E9A 020916AD 2BA08960
5FDA7B2F
AA301006 092B0601 04018237 15010403 02010030 0D06092A 864886F7
0D010105
05000382 0101009D 9D8484A3 41A97C77 0CB753CA 4E445062 EF547CD3
75171CE8
E0C6484B B6FE4C3A 198156B0 56EE1996 62AA5AA3 64C1F64E 5433C677
FEC51CBA
E55D25CA F5F0939A 83112EE6 CBF87445 FEE705B8 ABE7DFCB 4BE13784
DAB98B97
701EF0E2 8BD7B0D8 0E9DB169 D62A917B A9494F7E E68E95D8 83273CD5
68490ED4
9DF62EEB A7BEEB30 A4AC1F44 FC95AB33 06FB7D60 0ADEB48A 63B09CA9
F2A4B953

0187D068 A4277FAB FFE9FAC9 40388867 B439C684 6F57C953 DBBA8EEE
C043B2F8
09836EFF 66CF3EEF 17B35818 2509345E E3CBD614 B6ECF292 6F74E42F
812AD592
91E0E097 3C326805 854BD1F7 57E2521D 931A549F 0570C04A 71601E43
0B601EFE
A3CE8119 E10B35
quit
crypto pki certificate chain TP-self-signed-14338
certificate self-signed 01
30820221 3082018A A0030201 02020101 300D0609 2A864886 F70D0101
05050030
2C312A30 28060355 04031321 494F532D 53656C66 2D536967 6E65642D
43657274
69666963 6174652D 31343333 38301E17 0D313231 32313432 30343534
335A170D
32303031 30313030 30303030 5A302C31 2A302806 03550403 1321494F
532D5365
6C662D53 69676E65 642D4365 72746966 69636174 652D3134 33333830
819F300D
06092A86 4886F70D 01010105 0003818D 00308189 02818100 9A622402
4FA6C39A
F95B73F9 9B51FFA2 FB19BCA3 FB10894A 78D0344B 6104006D 38CA2858
9231E1B6
25BEA29B 10A2B2DF 13B5F1C5 6C93396D 120A281B 2A8F66F8 1D77F2A3
24E198B8
5D130448 3D4DC35F 6BE42414 007F0CC1 965D3FF8 EAE7AE2C 309F72FF
B23B865F
4CE70367 C9A2B6F0 6CC2D1F9 772CBA87 EB5E3E4E C4AC19BD 02030100
01A35330
51300F06 03551D13 0101FF04 05300301 01FF301F 0603551D 23041830
16801495
0F017D35 C7135653 90C2BB1D 3EB941AD 689C1730 1D060355 1D0E0416
0414950F
017D35C7 13565390 C2BB1D3E B941AD68 9C17300D 06092A86 4886F70D
01010505

```

00038181 006F263C A62F9F3E BB29F1EF 7CF35FF9 DE511C66 89140F74
CD1AEE2A
55AC96B9 A3AF696A E339120D 61035CD1 55FC9DCA 33E9A86A DA5A0159
D9A58627
5A2AF3F3 1AD170F7 93A925A1 A790B40E 2ABDDC32 448D1B24 B222560B
1725225D
B70E3F67 66B8C4BD 33226D87 F740C3AD A73DA32B 85DD4989 416FE965
B31239A9
211ABFFC 1B
quit
power redundancy-mode redundant
!
spanning-tree mode rapid-pvst
spanning-tree portfast bpduguard default
spanning-tree extend system-id
spanning-tree vlan 1-4094 priority 24576
!
redundancy
mode sso
!
vlan internal allocation policy ascending
!
vlan 164
name Data
!
vlan 165
name Voice
!
vlan 166
name Data2
!
vlan 167
name Voice2
!
vlan 179
name Management
!

```

```

vlan 999
!
ip ssh source-interface Loopback0
ip ssh version 2
!
class-map match-any MULTIMEDIA-STREAMING-QUEUE
match dscp af31 af32 af33
class-map match-any CONTROL-MGMT-QUEUE
match dscp cs7
match dscp cs6
match dscp cs3
match dscp cs2
class-map match-any TRANSACTIONAL-DATA-QUEUE
match dscp af21 af22 af23
class-map match-any SCAVENGER-QUEUE
match dscp cs1
class-map match-any MULTIMEDIA-CONFERENCING-QUEUE
match dscp af41 af42 af43
class-map match-any BULK-DATA-QUEUE
match dscp af11 af12 af13
class-map match-any PRIORITY-QUEUE
match dscp ef
match dscp cs5
match dscp cs4
!
policy-map 1P7Q1T
class PRIORITY-QUEUE
priority
class CONTROL-MGMT-QUEUE
bandwidth remaining percent 10
class MULTIMEDIA-CONFERENCING-QUEUE
bandwidth remaining percent 10
class MULTIMEDIA-STREAMING-QUEUE
bandwidth remaining percent 10
class TRANSACTIONAL-DATA-QUEUE
bandwidth remaining percent 10
dbl

```

```

class BULK-DATA-QUEUE
    bandwidth remaining percent 4
    dbl
class SCAVENGER-QUEUE
    bandwidth remaining percent 1
class class-default
    bandwidth remaining percent 25
    dbl
!
macro name AccessEdgeQoS
    auto qos voip cisco-phone
@
macro name EgressQoS
    service-policy output 1P7Q1T
@
!
interface Loopback0
    ip address 10.4.79.254 255.255.255.255
    ip pim sparse-mode
!
interface Port-channel1
    description Etherchannel link to A2960S
    switchport
    switchport trunk native vlan 999
    switchport trunk allowed vlan 164,165,179
    switchport mode trunk
    logging event link-status
    flowcontrol receive on
!
interface Port-channel2
    description Etherchannel link to A3750X-PR2
    switchport
    switchport trunk native vlan 999
    switchport trunk allowed vlan 166,167,179
    switchport mode trunk
    logging event link-status
    flowcontrol receive on

```

```

!
interface FastEthernet1
    ip vrf forwarding mgmtVrf
    no ip address
    speed auto
    duplex auto
!
interface TenGigabitEthernet1/1
    description Link to A2960S Ten 1/0/1
    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 TenGigabitEthernet1/2
    description Link to A3750X-PR2 Ten1/1/1
    switchport trunk native vlan 999
    switchport trunk allowed vlan 166,167,179
    switchport mode trunk
    logging event link-status
    logging event trunk-status
    macro description EgressQoS | EgressQoS
    channel-protocol lacp
    channel-group 2 mode active
    service-policy output 1P7Q1T
!
interface TenGigabitEthernet1/3
!
! *****
! Interface TenGigabitEthernet 1/4 - 1/12 are all configured the
! same as 1/3 and have been removed for conciseness
! *****

```

```

!
!interface TenGigabitEthernet2/1
description Link to A2960S Ten 3/0/1
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 TenGigabitEthernet2/2
description Link to A3750X-PR2 Ten1/1/2
switchport trunk native vlan 999
switchport trunk allowed vlan 166,167,179
switchport mode trunk
logging event link-status
logging event trunk-status
macro description EgressQoS | EgressQoS
channel-protocol lacp
channel-group 2 mode active
service-policy output 1P7Q1T
!
interface TenGigabitEthernet2/3
!
! *****
! Interface TenGigabitEthernet 2/4 - 2/12 are all configured the
! same as 2/3 and have been removed for conciseness
! *****
!
interface TenGigabitEthernet3/1
description Link to C6506-1 Ten 4/1
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
logging event link-status
logging event trunk-status
carrier-delay msec 0
macro description EgressQoS
service-policy output 1P7Q1T
!
interface TenGigabitEthernet3/2
!
interface TenGigabitEthernet3/3
!
interface TenGigabitEthernet3/4
!
interface TenGigabitEthernet4/1
description Link to C6506-2 Ten 4/1
no switchport
ip address 10.4.40.22 255.255.255.252
ip pim sparse-mode
ip summary-address eigrp 100 10.4.64.0 255.255.240.0
logging event link-status
logging event trunk-status
carrier-delay msec 0
macro description EgressQoS
service-policy output 1P7Q1T
!
interface TenGigabitEthernet4/2
!
interface TenGigabitEthernet4/3
!
interface TenGigabitEthernet4/4
!
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
shutdown
!
interface Vlan165
ip address 10.4.65.1 255.255.255.0
ip helper-address 10.4.48.10
ip pim sparse-mode
shutdown
!
interface Vlan166
ip address 10.4.66.1 255.255.255.0
ip helper-address 10.4.48.10
ip pim sparse-mode
shutdown
!
interface Vlan167
ip address 10.4.67.1 255.255.255.0
ip helper-address 10.4.48.10
ip pim sparse-mode
shutdown
!
interface Vlan179
ip address 10.4.79.1 255.255.255.128
ip pim sparse-mode
shutdown
!
!
router eigrp 100
network 10.4.0.0 0.1.255.255
passive-interface default
no passive-interface TenGigabitEthernet3/1
no passive-interface TenGigabitEthernet4/1
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
!
access-list 55 permit 10.4.48.0 0.0.0.255
!
snmp-server community cisco RO
snmp-server community cisco123 RW
!
tacacs server TACACS-SERVER-1
address ipv4 10.4.48.15
key 7 03375E08140A35674B10
!
line con 0
stopbits 1
line vty 0 4
transport preferred none
transport input ssh
line vty 5 15
transport preferred none
transport input ssh
!
ntp update-calendar
ntp server 10.4.48.17
end

```

Catalyst Virtual Switching System 4T

The Cisco Catalyst 6500 VSS 4T system 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 also provide the highest density of the product options for Gigabit Ethernet and 10-Gigabit Ethernet EtherChannel uplinks using Cisco Multi-chassis EtherChannel.

```
!  
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  
!  
hw-module switch 1 slot 2 operation-mode port-group 2  
TenGigabitEthernet  
hw-module switch 1 slot 3 operation-mode port-group 2  
TenGigabitEthernet  
hw-module switch 2 slot 2 operation-mode port-group 2  
TenGigabitEthernet  
hw-module switch 2 slot 3 operation-mode port-group 2  
TenGigabitEthernet  
enable secret 5 $1$rI18$1AMiJacfgqyn7sxDJ4XTU0  
!  
username admin password 7 141443180F0B7B7977  
aaa new-model  
!  
aaa group server tacacs+ TACACS-SERVERS  
!  
aaa authentication login default group tacacs+ local  
aaa authorization console  
aaa authorization exec default group tacacs+ local
```

```
!  
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 10.4.48.10  
ip multicast-routing  
vtp mode transparent  
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  
!  
crypto pki trustpoint TP-self-signed-1408  
    enrollment selfsigned  
    subject-name cn=IOS-Self-Signed-Certificate-1408  
    revocation-check none  
    rsakeypair TP-self-signed-1408  
!  
crypto pki certificate chain TP-self-signed-1408  
    certificate self-signed 01  
        30820240 308201A9 A0030201 02020101 300D0609 2A864886 F70D0101  
        04050030
```

```

2B312930 27060355 04031320 494F532D 53656C66 2D536967 6E65642D
43657274
69666963 6174652D 31343038 301E170D 31323132 31333232 30333434
5A170D32
30303130 31303030 3030305A 302B3129 30270603 55040313 20494F53
2D53656C
662D5369 676E6564 2D436572 74696669 63617465 2D313430 3830819F
300D0609
2A864886 F70D0101 01050003 818D0030 81890281 8100AF47 869CAF01
E5674724
DDE79228 DD0C2DE6 B6AE1F16 20665AB0 A27E6F5B 76C7E4A5 9E19B293
F7FCE888
09933677 636D003F 208DAB4B 97C35FAC C9B84B32 398D8A86 B1FCB400
4C8E89EC
2BF703C8 BEAEE93E CF21848B 3615F9DC 78B2AC02 2E26B4CF 14E03366
7F5D7418
6E385309 CE437754 5013AB11 9B041044 74E36EBA 3F010203 010001A3
74307230
0F060355 1D130101 FF040530 030101FF 301F0603 551D1104 18301682
14443635
30305653 532E6369 73636F2E 6C6F6361 6C301F06 03551D23 04183016
8014FCB1
33ED2E3A 499724E5 66CF6FA2 BBC813C7 FD60301D 0603551D 0E041604
14FCB133
ED2E3A49 9724E566 CF6FA2BB C813C7FD 60300D06 092A8648 86F70D01
01040500
03818100 569FEDBF 0487BDBF 77DCC965 E90A0011 91D72AEC EC995429
106ECD75
EA0AA1C2 C30A360B C5311124 7B421A86 56F864E4 08058862 14F911AA
C4283FAD
98C0C5DF E0B6046C 568B5554 86638FA6 937C915B 72350635 199CAD34
6ABAAA75
E2C0FDCB D7549723 D0F2DB62 BDD1106B E2545FE1 DA3BD3FA 4CA85A67
87769E11 90B41374
quit
!
macro name EgressQoS_TenOrFortyGig

```

```

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
spanning-tree vlan 1-4094 priority 24576
!
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 Data_1
mtu 9216
!
vlan 101
name Voice_1
!
vlan 102
name Data_2
!
vlan 103
name Voice_2
!
vlan 104
name Data_3
!

```

```

vlan 105
  name Voice_3
!
vlan 115
  name Management
!
vlan 999
!
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-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-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-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 10.4.15.254 255.255.255.255
  ip pim sparse-mode
!
interface Port-channel1
  description Link to A4507
  switchport
  switchport trunk native vlan 999
  switchport trunk allowed vlan 100,101,115
  switchport mode trunk
  logging event link-status
!
interface Port-channel2
  switchport

```

```

switchport trunk native vlan 999
switchport trunk allowed vlan 102,103,115
switchport mode trunk
logging event trunk-status
!
interface Port-channel3
description EtherChannel link to A3750X-PR1
switchport
switchport trunk native vlan 999
switchport trunk allowed vlan 104,105,115
switchport mode trunk
logging event link-status
!
interface Port-channel30
description Link to C6506-1
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-channel31
description Link to C6506-2
no switchport
ip address 10.4.40.14 255.255.255.252
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
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 GigabitEthernet1/1/1
no switchport
no ip address
shutdown
!
! *****
! Interface GigabitEthernet 1/1/2 - 1/1/23 are all configured
! the same as 1/1/1 and have been removed for conciseness
! *****
!
interface GigabitEthernet1/1/24
no switchport
no ip address
no cdp enable
dual-active fast-hello
!
interface FortyGigabitEthernet1/2/1
description Link to C6506-1 For 3/1
no switchport
no ip address
macro description EgressQoS TenOrFortyGig
channel-protocol lacp
channel-group 30 mode active
service-policy type lan-queuing output 1P7Q4T
!
interface FortyGigabitEthernet1/2/2
no switchport
no ip address
shutdown
!
interface TenGigabitEthernet1/2/13
switchport
switchport trunk native vlan 999
switchport trunk allowed vlan 100,101,115
switchport mode trunk

```

```

logging event link-status
logging event trunk-status
logging event bundle-status
macro description EgressQoSSTenOrFortyGig
channel-protocol lacp
channel-group 1 mode active
service-policy type lan-queuing output 1P7Q4T
!
interface TenGigabitEthernet1/2/14
switchport
switchport trunk native vlan 999
switchport trunk allowed vlan 104,105,115
switchport mode trunk
logging event link-status
logging event trunk-status
logging event bundle-status
macro description EgressQoSSTenOrFortyGig
channel-protocol lacp
channel-group 3 mode active
service-policy type lan-queuing output 1P7Q4T
!
interface TenGigabitEthernet1/2/15
no switchport
no ip address
shutdown
!
! *****
! Interface TenGigabitEthernet 1/2/16 - 1/2/20 are all configured
! the same as 1/2/15 and have been removed for conciseness
! *****
!
interface FortyGigabitEthernet1/3/1
description Link to C6506-2 For 3/1
no switchport
no ip address
macro description EgressQoSSTenOrFortyGig
channel-group 31 mode active

```

```

service-policy type lan-queuing output 1P7Q4T
!
interface FortyGigabitEthernet1/3/2
no switchport
no ip address
shutdown
!
interface TenGigabitEthernet1/3/13
description Link to A3750X Ten 1/1/1
switchport
switchport trunk native vlan 999
switchport trunk allowed vlan 102,103,115
switchport mode trunk
macro description EgressQoSSTenOrFortyGig
channel-protocol lacp
channel-group 2 mode active
service-policy type lan-queuing output 1P7Q4T
!
interface TenGigabitEthernet1/3/14
no switchport
no ip address
shutdown
!
! *****
! Interface TenGigabitEthernet 1/3/15 - 1/3/20 are all configured
! the same as 1/3/14 and have been removed for conciseness
! *****
!
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
  no cdp enable
  channel-group 101 mode on
!
interface TenGigabitEthernet1/5/5
  no switchport
  no ip address
  no cdp enable
  channel-group 101 mode on
!
interface GigabitEthernet2/1/1
  no switchport
  no ip address
  shutdown
!
! *****
! Interface GigabitEthernet 2/1/2 - 2/1/23 are all configured
! the same as 2/1/1 and have been removed for conciseness
! *****
!
interface GigabitEthernet2/1/24
  no switchport
  no ip address
  no cdp enable
  dual-active fast-hello
!
interface FortyGigabitEthernet2/2/1
  description Link to C6506-1 For 3/3
  no switchport

```

```

  no ip address
  logging event link-status
  logging event trunk-status
  logging event bundle-status
  macro description EgressQoS TenOrFortyGig
  channel-protocol lacp
  channel-group 30 mode active
  service-policy type lan-queuing output 1P7Q4T
!
interface FortyGigabitEthernet2/2/2
  no switchport
  no ip address
  shutdown
!
interface TenGigabitEthernet2/2/13
  switchport
  switchport trunk native vlan 999
  switchport trunk allowed vlan 100,101,115
  switchport mode trunk
  logging event link-status
  logging event trunk-status
  logging event bundle-status
  macro description EgressQoS TenOrFortyGig
  channel-protocol lacp
  channel-group 1 mode active
  service-policy type lan-queuing output 1P7Q4T
!
interface TenGigabitEthernet2/2/14
  switchport
  switchport trunk native vlan 999
  switchport trunk allowed vlan 104,105,115
  switchport mode trunk
  logging event link-status
  logging event trunk-status
  logging event bundle-status
  macro description EgressQoS TenOrFortyGig
  channel-protocol lacp

```

```

channel-group 3 mode active
service-policy type lan-queuing output 1P7Q4T
!
interface TenGigabitEthernet2/2/15
no switchport
no ip address
shutdown
!
! *****
! Interface TenGigabitEthernet 2/2/16 - 2/2/20 are all configured
! the same as 2/2/15 and have been removed for conciseness
! *****
!
interface FortyGigabitEthernet2/3/1
description Link to C6506-2 For 3/3
no switchport
no ip address
macro description EgressQoS TenOrFortyGig
channel-group 31 mode active
service-policy type lan-queuing output 1P7Q4T
!
interface FortyGigabitEthernet2/3/2
no switchport
no ip address
shutdown
!
interface TenGigabitEthernet2/3/13
description Link to A3750X Ten 3/1/1
switchport
switchport trunk native vlan 999
switchport trunk allowed vlan 102,103,115
switchport mode trunk
macro description EgressQoS TenOrFortyGig
channel-protocol lacp
channel-group 2 mode active
service-policy type lan-queuing output 1P7Q4T
!

```

```

interface TenGigabitEthernet2/3/14
no switchport
no ip address
shutdown
!
! *****
! Interface TenGigabitEthernet 2/3/15 - 2/3/20 are all configured
! the same as 1/3/14 and have been removed for conciseness
! *****
!
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
no cdp enable
channel-group 102 mode on
!
interface TenGigabitEthernet2/5/5
no switchport
no ip address
no cdp enable
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 Vlan102
  ip address 10.4.2.1 255.255.255.0
  ip helper-address 10.4.48.10
  ip pim sparse-mode
!
interface Vlan103
  ip address 10.4.3.1 255.255.255.0
  ip helper-address 10.4.48.10
  ip pim sparse-mode
!
interface Vlan104
  ip address 10.4.4.1 255.255.255.0
  ip helper-address 10.4.48.10
  ip pim sparse-mode
!
interface Vlan105
  ip address 10.4.5.1 255.255.255.0
  ip helper-address 10.4.48.10
  ip pim sparse-mode
!
interface Vlan115
  ip address 10.4.15.1 255.255.255.128
  ip helper-address 10.4.48.10

```

```

  ip pim sparse-mode
!
!
router eigrp 100
  network 10.4.0.0 0.1.255.255
  passive-interface default
  no passive-interface Port-channel30
  no passive-interface Port-channel31
  eigrp router-id 10.4.15.254
  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
!
logging 10.4.48.35
logging 10.4.48.38
logging 10.4.48.39
access-list 55 permit 10.4.48.0 0.0.0.255
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
snmp-server host 10.4.48.38 cisco
snmp-server host 10.4.48.35 cisco123

```

```

snmp-server host 10.4.48.39 cisco123
tacacs-server host 10.4.48.15 key 7 107D0C1A17120620091D
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
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 17179813
ntp source Loopback0
ntp update-calendar

```

```

ntp server 10.4.48.17
wsma agent exec profile PIwsmaExecServiceSSH
!
wsma profile listener PIwsmaExecServiceSSH
 transport ssh
!
module provision switch 1
 slot 1 slot-type 156 port-type 31 number 24 virtual-slot 17
 slot 2 slot-type 333 port-type 113 number 4 port-type 60 number
16 virtual-slot 18
 slot 3 slot-type 333 port-type 113 number 4 port-type 60 number
16 virtual-slot 19
 slot 5 slot-type 318 port-type 31 number 3 port-type 60 number 2
virtual-slot 21
!
module provision switch 2
 slot 1 slot-type 156 port-type 31 number 24 virtual-slot 33
 slot 2 slot-type 333 port-type 113 number 4 port-type 60 number
16 virtual-slot 34
 slot 3 slot-type 333 port-type 113 number 4 port-type 60 number
16 virtual-slot 35
 slot 5 slot-type 318 port-type 31 number 3 port-type 60 number 2
virtual-slot 37
!
end

```

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 deployment requirements for building a modular, resilient, scalable, and secure Layer 3 backbone solution.

```
!  
version 15.0  
service timestamps debug datetime msec localtime  
service timestamps log datetime msec localtime  
service password-encryption  
service counters max age 5  
!  
hostname C6506-1  
!  
boot-start-marker  
boot-end-marker  
!  
enable secret 5 $1$gLVw$INDb1aN3NUh7x9snPYeZ41  
!  
username admin password 7 104D580A061843595F  
aaa new-model  
!  
!aa authentication login default group tacacs+ local  
aaa authorization console  
aaa authorization exec default group tacacs+ local  
!  
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 10.4.48.10  
ip multicast-routing  
vtp mode transparent  
udld enable  
!  
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  
!  
crypto pki trustpoint TP-self-signed-1408  
enrollment selfsigned  
subject-name cn=IOS-Self-Signed-Certificate-1408  
revocation-check none  
rsakeypair TP-self-signed-1408  
!  
crypto pki certificate chain TP-self-signed-1408  
certificate self-signed 01  
  3082023F 308201A8 A0030201 02020101 300D0609 2A864886 F70D0101  
04050030  
  2B312930 27060355 04031320 494F532D 53656C66 2D536967 6E65642D  
43657274  
  69666963 6174652D 31343038 301E170D 31323132 31343232 30373538  
5A170D32
```

```

30303130 31303030 3030305A 302B3129 30270603 55040313 20494F53
2D53656C
662D5369 676E6564 2D436572 74696669 63617465 2D313430 3830819F
300D0609
2A864886 F70D0101 01050003 818D0030 81890281 8100E556 E84C6692
172CB0C1
A3FB3D17 FEA5DD5B 4EC662EA C1275E82 F0E0DB69 E8D97D95 A3C29F2C
1B23A4EA
77EE8E99 E57F51DA 5A37FF6D 3BDA783E C001DD82 7C7B4426 CE973032
82027A39
3CD2F568 BDB955E2 F132FC3D 05B9B355 296FA9D8 F8FC81A3 6AD0BFC1
FB86EAFB
24BDB700 84FB42EB 6DAA8C30 0FED954A DE2143BE CEBB0203 010001A3
73307130
0F060355 1D130101 FF040530 030101FF 301E0603 551D1104 17301582
13433635
30362D31 2E636973 636F2E6C 6F63616C 301F0603 551D2304 18301680
144C3225
3979B458 7A59C51B 3C235563 C8D15E1C 70301D06 03551D0E 04160414
4C322539
79B4587A 59C51B3C 235563C8 D15E1C70 300D0609 2A864886 F70D0101
04050003
81810016 E8D60322 91B1A471 5AE7CD6F 9003E416 92AB9B50 B2F81A6E
FED0B20C
D8B8492B 204DB750 1D4E384D F7BDDA34 15935330 02451C08 4BDDAA58
93582F0B
A32FA1C2 32EBB3DE C10AAC5F D06D80F1 4B98A783 1B2A6AE5 A25AAC66
5D2426B6
86577273 B51561B8 C737FD66 DAF3CD10 31A37F5B 8C912648 30501493
015911DF 97793F
quit
!
macro name EgressQoS TenOrFortyGig
    service-policy type lan-queuing output 1P7Q4T
@
macro name EgressQoS
    service-policy type lan-queuing output 1P3Q8T

```

```

@
!
spanning-tree mode rapid-pvst
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 141
    name ManagementNAM
!
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-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-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-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 10.4.40.254 255.255.255.255
  ip pim sparse-mode
!
```

```

interface Loopback1
  ip address 10.4.40.252 255.255.255.255
  ip pim sparse-mode
!
interface Port-channel30
  description Link to D6500VSS
  ip address 10.4.40.9 255.255.255.252
  ip pim sparse-mode
  logging event link-status
!
interface Port-channel32
  description Link to D3750X
  ip address 10.4.40.25 255.255.255.252
  ip pim sparse-mode
!
interface GigabitEthernet1/1
  description Link to D3750X Gig 1/1/1
  no ip address
  logging event link-status
  logging event trunk-status
  logging event bundle-status
  macro description EgressQoS
  channel-protocol lacp
  channel-group 32 mode active
  service-policy type lan-queuing output 1P3Q8T
!
interface GigabitEthernet1/2
  description Link to D3750X Gig 1/1/2
  no ip address
  logging event link-status
  logging event trunk-status
  logging event bundle-status
  macro description EgressQoS
  channel-protocol lacp
  channel-group 32 mode active
  service-policy type lan-queuing output 1P3Q8T
!
```

```

interface GigabitEthernet1/3
  description Link to D3750X Gig 3/1/1
  no ip address
  logging event link-status
  logging event trunk-status
  logging event bundle-status
  macro description EgressQoS
  channel-protocol lacp
  channel-group 32 mode active
  service-policy type lan-queuing output 1P3Q8T
!
interface GigabitEthernet1/4
  description Link to D3750X Gig 3/1/2
  no ip address
  logging event link-status
  logging event trunk-status
  logging event bundle-status
  macro description EgressQoS
  channel-protocol lacp
  channel-group 32 mode active
  service-policy type lan-queuing output 1P3Q8T
!
interface GigabitEthernet1/5
  no ip address
  shutdown
  service-policy type lan-queuing output 1P3Q8T
!
! *****
! Interface GigabitEthernet1/6 - 1/24 are all configured the same
! as 1/5 and have been removed for conciseness
! *****
!
interface FortyGigabitEthernet3/1
  description Link to D6506VSS For 1/2/1
  no ip address
  logging event link-status
  logging event trunk-status
  logging event bundle-status
  macro description EgressQoS
  channel-protocol lacp
  channel-group 30 mode active
  service-policy type lan-queuing output 1P7Q4T
!
interface FortyGigabitEthernet3/2
  no ip address
  shutdown
!
interface FortyGigabitEthernet3/3
  description Link to D6506VSS For 2/2/1
  no ip address
  logging event link-status
  logging event trunk-status
  logging event bundle-status
  macro description EgressQoS
  channel-protocol lacp
  channel-group 30 mode active
  service-policy type lan-queuing output 1P7Q4T
!
interface FortyGigabitEthernet3/4
  no ip address
  shutdown
!
interface TenGigabitEthernet4/1
  description Link to D4507 Ten 4/1
  ip address 10.4.40.17 255.255.255.252
  ip pim sparse-mode
  logging event link-status
  carrier-delay msec 0
  macro description EgressQoS
  service-policy type lan-queuing output 1P7Q4T
!
interface TenGigabitEthernet4/2
  no ip address
  shutdown

```

```

!
interface TenGigabitEthernet4/3
  no ip address
  shutdown
!
interface TenGigabitEthernet4/4
  no ip address
  shutdown
!
interface TenGigabitEthernet4/5
  description Link to IE-D3750X Ten 1/1/1
  ip address 10.4.40.33 255.255.255.252
  ip pim sparse-mode
  logging event link-status
  carrier-delay msec 0
  macro description EgressQoS TenOrFortyGig
  service-policy type lan-queuing output 1P7Q4T
!
interface TenGigabitEthernet4/6
  description Link to WAN-D3750X Ten 1/1/1
  ip address 10.4.40.41 255.255.255.252
  ip pim sparse-mode
  logging event link-status
  carrier-delay msec 0
  macro description EgressQoS TenOrFortyGig
  service-policy type lan-queuing output 1P7Q4T
!
interface TenGigabitEthernet4/7
  description Link to DC5596UPa Eth 1/19
  ip address 10.4.40.49 255.255.255.252
  ip pim sparse-mode
  logging event link-status
  carrier-delay msec 0
  macro description EgressQoS TenOrFortyGig
  service-policy type lan-queuing output 1P7Q4T
!
interface TenGigabitEthernet4/8

```

```

  description Link to DC5596UPb Eth 1/19
  ip address 10.4.40.57 255.255.255.252
  ip pim sparse-mode
  logging event link-status
  carrier-delay msec 0
  macro description EgressQoS TenOrFortyGig
  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 0.1.255.255
  eigrp router-id 10.4.40.254
!

```

```

ip forward-protocol nd
!
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 pim register-source Loopback0
ip msdp peer 10.4.40.253 connect-source Loopback0
ip msdp cache-sa-state
ip msdp originator-id 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
access-list 55 permit 10.4.48.0 0.0.0.255
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
tacacs-server host 10.4.48.15 key 7 15210E0F162F3F0F2D2A
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
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 17179949
ntp source Loopback0
ntp update-calendar
ntp server 10.4.48.17
!
end

```

Feedback

Please use the [feedback form](#) to send comments and suggestions about this guide.



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