



Sample DER and AR Switch Configurations for the 1-GE Asymmetric Topology

This appendix presents sample distribution edge router (DER) and aggregation router (AR) switch configurations for the asymmetric 1-GE topology described in [Configuration 2: N x 1-GE Asymmetric Ring, page 3-34](#). The following configurations are presented:

- [Configuration for DER, page B-1](#)
- [Configuration for AR1, page B-15](#)
- [Configuration for AR2, page B-23](#)
- [Configuration for AR3, page B-31](#)



Note

Refer to [Configuring the 1-GE Asymmetric Topology, page 4-53](#).

Configuration for DER

```
upgrade fpd auto
version 12.2
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
service counters max age 10
!
hostname DER
!
boot system disk0:s72033-adventerprisek9_wan-mz.122-18.SXE1.bin
logging snmp-authfail
enable password cisco123
!
no aaa new-model
clock timezone PST -8
clock summer-time PDT recurring
ip subnet-zero
!
!
!
ip multicast-routing
ip igmp ssm-map enable
ip domain multicast coronado.net
no ip domain-lookup
ip domain-name coronado.net
```

```

ip name-server 192.168.10.101
ip name-server 192.168.11.101
ipv6 mfib hardware-switching replication-mode ingress
vtp mode transparent
mls ip cef load-sharing full
mls ip multicast flow-stat-timer 9
no mls flow ip
no mls flow ipv6
mls qos map dscp-cos 36 to 2
mls qos map dscp-cos 38 to 1
mls qos
mls rate-limit unicast cef glean 100 10
no mls acl tcam share-global
mls cef error action freeze
no scripting tcl init
no scripting tcl encdir
!
!
!
!
!
!
!
!
!
!
redundancy
mode sso
main-cpu
  auto-sync running-config
  auto-sync standard
!
spanning-tree mode rapid-pvst
spanning-tree portfast bpduguard default
no spanning-tree optimize bpdu transmission
spanning-tree extend system-id
no spanning-tree vlan 800,816,900,916
spanning-tree vlan 90 priority 24576
!
power redundancy-mode combined
diagnostic cns publish cisco.cns.device.diag_results
diagnostic cns subscribe cisco.cns.device.diag_commands
!
vlan internal allocation policy ascending
vlan access-log ratelimit 2000
!
vlan 10
  name VLAN_10_Management
!
vlan 11
  name VLAN_11_Management
!
vlan 60
  name VLAN_60_Unicast_Video
!
vlan 70
  name VLAN_70_Multicast_Video
!
vlan 80
  name VLAN_80_VoIP
!
vlan 90
  name VLAN_90_HSD
!

```

```
vlan 800
  name VLAN_800_VoIP_to/from_AR1
  !
vlan 816
  name VLAN_816_VoIP_to/from_AR3
  !
vlan 900
  name VLAN_900_Video_to/from_AR1
  !
vlan 916
  name VLAN_916_Video_to/from_AR3
  !
class-map match-all class_VoIP
  match access-group name acl_VoIP
class-map match-all class_video_VoD_high
  match access-group name acl_video_VoD_high
class-map match-all class_video_VoD_low
  match access-group name acl_video_VoD_low
class-map match-all class_video_broadcast
  match access-group name acl_video_broadcast
class-map match-all class_VoD_signaling
  match access-group name acl_VoD_signaling
class-map match-all class_HSD
  match access-group name acl_HSD
  !
  !
policy-map setDSCP
  description Mark DSCP values for ingress traffic
  class class_VoIP
    set dscp ef
  class class_HSD
    set dscp default
  class class_VoD_signaling
    set dscp cs3
  class class_video_broadcast
    set dscp af41
  class class_video_VoD_high
    set dscp af42
  class class_video_VoD_low
    set dscp af43
  !
  !
  !
interface Loopback0
  description Endpoint for Tunnel0
  ip address 10.10.10.1 255.255.255.255
  !
interface Loopback4
  description Endpoint for Tunnel4
  ip address 10.10.10.5 255.255.255.255
  !
interface Loopback8
  description Endpoint for Tunnel8
  ip address 10.10.10.9 255.255.255.255
  !
interface Loopback12
  description Endpoint for Tunnel12
  ip address 10.10.10.13 255.255.255.255
  !
interface Loopback48
  description Endpoint for Tunnel48
  ip address 10.10.10.49 255.255.255.255
  !
interface Loopback52
```

```

description Endpoint for Tunnel152
ip address 10.10.10.53 255.255.255.255
!
interface Loopback56
description Endpoint for Tunnel156
ip address 10.10.10.57 255.255.255.255
!
interface Loopback60
description Endpoint for Tunnel160
ip address 10.10.10.61 255.255.255.255
!
interface Tunnel0
description Rx-side of Tx-only Gig7/3
no ip address
tunnel source 10.10.10.1
tunnel destination 10.10.10.2
tunnel udlr receive-only GigabitEthernet7/3
!
interface Tunnel4
description Rx-side of Tx-only Gig7/4
no ip address
tunnel source 10.10.10.5
tunnel destination 10.10.10.6
tunnel udlr receive-only GigabitEthernet7/4
!
interface Tunnel8
description Rx-side of Tx-only Gig7/5
no ip address
tunnel source 10.10.10.9
tunnel destination 10.10.10.10
tunnel udlr receive-only GigabitEthernet7/5
!
interface Tunnel12
description Rx-side of Tx-only Gig7/6
no ip address
tunnel source 10.10.10.13
tunnel destination 10.10.10.14
tunnel udlr receive-only GigabitEthernet7/6
!
interface Tunnel48
description Rx-side of Tx-only Gig7/11
no ip address
tunnel source 10.10.10.49
tunnel destination 10.10.10.50
tunnel udlr receive-only GigabitEthernet7/11
!
interface Tunnel52
description Rx-side of Tx-only Gig7/12
no ip address
tunnel source 10.10.10.53
tunnel destination 10.10.10.54
tunnel udlr receive-only GigabitEthernet7/12
!
interface Tunnel56
description Rx-side of Tx-only Gig7/13
no ip address
tunnel source 10.10.10.57
tunnel destination 10.10.10.58
tunnel udlr receive-only GigabitEthernet7/13
!
interface Tunnel60
description Rx-side of Tx-only Gig7/14
no ip address
tunnel source 10.10.10.61

```

```
tunnel destination 10.10.10.62
tunnel udld receive-only GigabitEthernet7/14
!
interface GigabitEthernet1/1
description High speed data ingress/egress port
switchport
switchport access vlan 90
switchport mode access
no ip address
load-interval 30
no cdp enable
spanning-tree portfast
spanning-tree bpduguard enable
service-policy input setDSCP
!
interface GigabitEthernet1/2
no ip address
shutdown
!
interface GigabitEthernet1/3
no ip address
shutdown
!
! <----- interfaces GigabitEthernet1/4 - 22 omitted ----->
!
interface GigabitEthernet1/23
no ip address
shutdown
!
interface GigabitEthernet1/24
no ip address
shutdown
!
interface GigabitEthernet2/1
description VoIP traffic ingress/egress port
switchport
switchport access vlan 80
switchport mode access
no ip address
load-interval 30
no cdp enable
spanning-tree portfast
spanning-tree bpduguard enable
service-policy input setDSCP
!
interface GigabitEthernet2/2
no ip address
shutdown
!
interface GigabitEthernet2/3
no ip address
shutdown
!
! <----- interfaces GigabitEthernet2/4 - 6 omitted ----->
!
interface GigabitEthernet2/7
no ip address
shutdown
!
interface GigabitEthernet2/8
no ip address
shutdown
!
interface GigabitEthernet2/9
```

```

description Broadcast video source (multicast 232.1.1.1 - 232.1.1.10)
switchport
switchport access vlan 70
switchport mode access
no ip address
load-interval 30
no cdp enable
spanning-tree portfast
spanning-tree bpduguard enable
service-policy input setDSCP
!
interface GigabitEthernet2/10
no ip address
shutdown
!
interface GigabitEthernet2/11
no ip address
shutdown
!
! <----- interfaces GigabitEthernet2/12 - 14 omitted ----->
!
interface GigabitEthernet2/15
no ip address
shutdown
!
interface GigabitEthernet2/16
no ip address
shutdown
!
interface GigabitEthernet2/17
description Management port from Kasenna LR Server (Eth0)
switchport
switchport access vlan 10
switchport mode access
no ip address
load-interval 30
no cdp enable
spanning-tree portfast
spanning-tree bpduguard enable
service-policy input setDSCP
!
interface GigabitEthernet2/18
description Kasenna VoD Pump Management
switchport
switchport access vlan 10
switchport mode access
no ip address
load-interval 30
no cdp enable
spanning-tree portfast
spanning-tree bpduguard enable
service-policy input setDSCP
!
interface GigabitEthernet2/19
description Unicast video from Kasenna VoD Pump (HPN0)
switchport
switchport access vlan 60
switchport mode access
no ip address
load-interval 30
no cdp enable
spanning-tree portfast
spanning-tree bpduguard enable
service-policy input setDSCP

```

```
!
interface GigabitEthernet2/20
  description Unicast video from Kasenna VoD Pump (HPN1)
  switchport
  switchport access vlan 60
  switchport mode access
  no ip address
  load-interval 30
  no cdp enable
  spanning-tree portfast
  spanning-tree bpduguard enable
  service-policy input setDSCP
!
interface GigabitEthernet2/21
  no ip address
  shutdown
!
interface GigabitEthernet2/22
  no ip address
  shutdown
!
! <----- interfaces GigabitEthernet2/23 - 45 omitted ----->
!
interface GigabitEthernet2/46
  no ip address
  shutdown
!
interface GigabitEthernet2/47
  no ip address
  shutdown
!
interface GigabitEthernet2/48
  description Backup DNS server
  switchport
  switchport access vlan 11
  switchport mode access
  no ip address
  load-interval 30
  no cdp enable
  spanning-tree portfast
  spanning-tree bpduguard enable
  service-policy input setDSCP
!
interface GigabitEthernet5/1
  no ip address
  shutdown
!
interface GigabitEthernet5/2
  description Primary DNS/DHCP/NTP/TFTP/Syslog servers
  switchport
  switchport access vlan 10
  switchport mode access
  no ip address
  load-interval 30
  media-type rj45
  no cdp enable
  spanning-tree portfast
  spanning-tree bpduguard enable
  service-policy input setDSCP
!
interface GigabitEthernet7/1
  description Transport to/from AR1 (Gig3/1)
  switchport
  switchport trunk encapsulation dot1q
```

```

switchport trunk allowed vlan 90,800,900
switchport mode trunk
dampening
no ip address
load-interval 30
carrier-delay msec 0
wrr-queue bandwidth 64 255
wrr-queue queue-limit 40 50
wrr-queue random-detect min-threshold 1 75 100
wrr-queue random-detect min-threshold 2 50 100
wrr-queue random-detect max-threshold 1 100 100
wrr-queue random-detect max-threshold 2 50 100
wrr-queue cos-map 1 1 0
wrr-queue cos-map 2 1 1
wrr-queue cos-map 2 2 2 3 4 6 7
mls qos trust dscp
!
interface GigabitEthernet7/2
!
interface GigabitEthernet7/3
description VoD transport to AR1 (Gig3/3)
dampening
ip address 192.168.253.1 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed nonegotiate
wrr-queue bandwidth 64 255
wrr-queue queue-limit 40 50
wrr-queue random-detect min-threshold 1 75 100
wrr-queue random-detect min-threshold 2 50 100
wrr-queue random-detect max-threshold 1 100 100
wrr-queue random-detect max-threshold 2 50 100
wrr-queue cos-map 1 1 0
wrr-queue cos-map 2 1 1
wrr-queue cos-map 2 2 2 3 4 6 7
mls qos trust dscp
unidirectional send-only
!
interface GigabitEthernet7/4
description VoD transport to AR1 (Gig3/4)
dampening
ip address 192.168.253.5 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed nonegotiate
wrr-queue bandwidth 64 255
wrr-queue queue-limit 40 50
wrr-queue random-detect min-threshold 1 75 100
wrr-queue random-detect min-threshold 2 50 100
wrr-queue random-detect max-threshold 1 100 100
wrr-queue random-detect max-threshold 2 50 100
wrr-queue cos-map 1 1 0
wrr-queue cos-map 2 1 1
wrr-queue cos-map 2 2 2 3 4 6 7
mls qos trust dscp
unidirectional send-only
!
interface GigabitEthernet7/5
description VoD transport to AR1 (Gig3/5)
dampening

```



```

ip address 192.168.253.9 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed nonegotiate
wrr-queue bandwidth 64 255
wrr-queue queue-limit 40 50
wrr-queue random-detect min-threshold 1 75 100
wrr-queue random-detect min-threshold 2 50 100
wrr-queue random-detect max-threshold 1 100 100
wrr-queue random-detect max-threshold 2 50 100
wrr-queue cos-map 1 1 0
wrr-queue cos-map 2 1 1
wrr-queue cos-map 2 2 2 3 4 6 7
mls qos trust dscp
unidirectional send-only
!
interface GigabitEthernet7/6
description VoD transport to AR1 (Gig3/6)
dampening
ip address 192.168.253.13 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed nonegotiate
wrr-queue bandwidth 64 255
wrr-queue queue-limit 40 50
wrr-queue random-detect min-threshold 1 75 100
wrr-queue random-detect min-threshold 2 50 100
wrr-queue random-detect max-threshold 1 100 100
wrr-queue random-detect max-threshold 2 50 100
wrr-queue cos-map 1 1 0
wrr-queue cos-map 2 1 1
wrr-queue cos-map 2 2 2 3 4 6 7
mls qos trust dscp
unidirectional send-only
!
interface GigabitEthernet7/7
!
interface GigabitEthernet7/8
!
interface GigabitEthernet7/9
description Transport to/from AR3 (Gig3/1)
switchport
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 90,816,916
switchport mode trunk
dampening
no ip address
load-interval 30
carrier-delay msec 0
wrr-queue bandwidth 64 255
wrr-queue queue-limit 40 50
wrr-queue random-detect min-threshold 1 75 100
wrr-queue random-detect min-threshold 2 50 100
wrr-queue random-detect max-threshold 1 100 100
wrr-queue random-detect max-threshold 2 50 100
wrr-queue cos-map 1 1 0
wrr-queue cos-map 2 1 1
wrr-queue cos-map 2 2 2 3 4 6 7
mls qos trust dscp
!

```

```

interface GigabitEthernet7/10
!
interface GigabitEthernet7/11
description VoD transport to AR3 (Gig3/3)
dampening
ip address 192.168.253.49 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed nonegotiate
wrr-queue bandwidth 64 255
wrr-queue queue-limit 40 50
wrr-queue random-detect min-threshold 1 75 100
wrr-queue random-detect min-threshold 2 50 100
wrr-queue random-detect max-threshold 1 100 100
wrr-queue random-detect max-threshold 2 50 100
wrr-queue cos-map 1 1 0
wrr-queue cos-map 2 1 1
wrr-queue cos-map 2 2 2 3 4 6 7
mls qos trust dscp
unidirectional send-only
!
interface GigabitEthernet7/12
description VoD transport to AR3 (Gig3/4)
dampening
ip address 192.168.253.53 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed nonegotiate
wrr-queue bandwidth 64 255
wrr-queue queue-limit 40 50
wrr-queue random-detect min-threshold 1 75 100
wrr-queue random-detect min-threshold 2 50 100
wrr-queue random-detect max-threshold 1 100 100
wrr-queue random-detect max-threshold 2 50 100
wrr-queue cos-map 1 1 0
wrr-queue cos-map 2 1 1
wrr-queue cos-map 2 2 2 3 4 6 7
mls qos trust dscp
unidirectional send-only
!
interface GigabitEthernet7/13
description VoD transport to AR3 (Gig3/5)
dampening
ip address 192.168.253.57 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed nonegotiate
wrr-queue bandwidth 64 255
wrr-queue queue-limit 40 50
wrr-queue random-detect min-threshold 1 75 100
wrr-queue random-detect min-threshold 2 50 100
wrr-queue random-detect max-threshold 1 100 100
wrr-queue random-detect max-threshold 2 50 100
wrr-queue cos-map 1 1 0
wrr-queue cos-map 2 1 1
wrr-queue cos-map 2 2 2 3 4 6 7
mls qos trust dscp
unidirectional send-only

```

```
!  
interface GigabitEthernet7/14  
  description VoD transport to AR3 (Gig3/6)  
  dampening  
  ip address 192.168.253.61 255.255.255.252  
  ip ospf network point-to-point  
  ip ospf hello-interval 1  
  carrier-delay msec 0  
  speed nonegotiate  
  wrr-queue bandwidth 64 255  
  wrr-queue queue-limit 40 50  
  wrr-queue random-detect min-threshold 1 75 100  
  wrr-queue random-detect min-threshold 2 50 100  
  wrr-queue random-detect max-threshold 1 100 100  
  wrr-queue random-detect max-threshold 2 50 100  
  wrr-queue cos-map 1 1 0  
  wrr-queue cos-map 2 1 1  
  wrr-queue cos-map 2 2 2 3 4 6 7  
  mls qos trust dscp  
  unidirectional send-only  
!  
interface GigabitEthernet7/15  
!  
interface GigabitEthernet7/16  
!  
interface Vlan1  
  no ip address  
  shutdown  
!  
interface Vlan10  
  description Management VLAN (VoD signaling, Primary DNS, DHCP, etc)  
  ip address 192.168.10.1 255.255.255.0  
  no ip redirects  
  no ip unreachablees  
  load-interval 30  
!  
interface Vlan11  
  description Management VLAN (Backup DNS)  
  ip address 192.168.11.1 255.255.255.0  
  no ip redirects  
  no ip unreachablees  
  load-interval 30  
!  
interface Vlan60  
  description VoD server VLAN (Unicast Video)  
  ip address 192.168.60.1 255.255.255.0  
  no ip redirects  
  no ip unreachablees  
  ip pim sparse-mode  
  load-interval 30  
!  
interface Vlan70  
  description Broadcast video ingress VLAN (Multicast Video)  
  ip address 192.168.70.1 255.255.255.0  
  no ip redirects  
  no ip unreachablees  
  ip pim sparse-mode  
  load-interval 30  
!  
interface Vlan80  
  description VoIP ingress/egress VLAN  
  ip address 192.168.80.1 255.255.255.0  
  no ip redirects  
  no ip unreachablees
```

```

load-interval 30
!
interface Vlan800
description VoIP transport to/from AR1
ip address 192.168.252.1 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
!
interface Vlan816
description VoIP transport to/from AR3
ip address 192.168.252.17 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
!
interface Vlan900
description Video transport to/from AR1
ip address 192.168.254.1 255.255.255.252
ip pim sparse-mode
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
!
interface Vlan916
description Video transport to/from AR3
ip address 192.168.254.17 255.255.255.252
ip pim sparse-mode
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
!
router ospf 100
router-id 1.1.1.1
log-adjacency-changes
timers throttle spf 10 100 1000
timers throttle lsa all 1 10 1000
timers lsa arrival 100
passive-interface Vlan10
passive-interface Vlan11
passive-interface Vlan60
passive-interface Vlan70
network 10.10.10.0 0.0.0.255 area 0
network 192.168.10.0 0.0.1.255 area 0
network 192.168.60.0 0.0.0.255 area 0
network 192.168.70.0 0.0.0.255 area 0
network 192.168.254.0 0.0.0.255 area 0
maximum-paths 8
!
router ospf 101
router-id 1.1.1.2
log-adjacency-changes
timers throttle spf 10 100 1000
timers throttle lsa all 1 10 1000
timers lsa arrival 100
passive-interface Vlan80
network 192.168.80.0 0.0.0.255 area 0
network 192.168.252.0 0.0.0.255 area 0
maximum-paths 8
!
router ospf 102
router-id 1.1.1.3
log-adjacency-changes
timers throttle spf 10 100 1000

```

```

timers throttle lsa all 1 10 1000
timers lsa arrival 100
network 192.168.253.0 0.0.0.255 area 0
maximum-paths 8
!
ip classless
!
no ip http server
ip pim ssm default
!
ip access-list extended acl_HSD
remark Identify HSD traffic
permit ip 192.168.90.0 0.0.0.255 any
ip access-list extended acl_VoD_signaling
remark Identify VoD signaling traffic
permit ip host 192.168.10.102 any
permit ip host 192.168.10.103 any
ip access-list extended acl_VoIP
remark Identify VoIP traffic
permit ip 192.168.80.0 0.0.0.255 any
ip access-list extended acl_video_VoD_high
remark Identify high priority VoD traffic
permit udp 192.168.60.0 0.0.0.255 192.168.110.0 0.0.0.255 range 5000 9000
permit udp 192.168.60.0 0.0.0.255 192.168.120.0 0.0.0.255 range 5000 9000
permit udp 192.168.60.0 0.0.0.255 192.168.130.0 0.0.0.255 range 5000 9000
ip access-list extended acl_video_VoD_low
remark Identify low priority VoD traffic
permit udp 192.168.60.0 0.0.0.255 192.168.110.0 0.0.0.255 range 1000 4999
permit udp 192.168.60.0 0.0.0.255 192.168.120.0 0.0.0.255 range 1000 4999
permit udp 192.168.60.0 0.0.0.255 192.168.130.0 0.0.0.255 range 1000 4999
ip access-list extended acl_video_broadcast
remark Identify broadcast video traffic (multicast)
permit ip 192.168.70.0 0.0.0.255 232.0.0.0 0.255.255.255
!
logging event link-status default
logging trap debugging
logging source-interface Vlan10
logging 192.168.10.101
!
!
!
control-plane
!
!
!
dial-peer cor custom
!
!
!
!
line con 0
exec-timeout 0 0
password cisco123
logging synchronous
login
line vty 0 4
exec-timeout 0 0
password cisco123
logging synchronous
login
!
!
ntp clock-period 17179996
ntp update-calendar

```

■ Configuration for DER

```
ntp server 192.168.10.102 prefer
no cns aaa enable
end
```

Configuration for AR1

```

version 12.2
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
service internal
service compress-config
!
hostname AR1
!
boot-start-marker
boot system bootflash:cat4000-i5s-mz.122-25.EWA.bin
boot-end-marker
!
!
redundancy
notification-timer 60000
mode sso
main-cpu
auto-sync standard
enable password cisco123
!
no aaa new-model
clock timezone PST -8
clock summer-time PDT recurring
qos map dscp 34 36 38 48 49 50 51 52 to tx-queue 2
qos map dscp 53 54 55 56 57 58 59 60 to tx-queue 2
qos map dscp 61 62 63 to tx-queue 2
qos map dscp 38 to cos 1
qos map dscp 36 to cos 2
qos
vtp mode transparent
ip subnet-zero
ip cef load-sharing algorithm include-ports destination
ip domain multicast coronado.net
no ip domain-lookup
ip name-server 192.168.10.101
ip name-server 192.168.11.101
!
ip multicast-routing
ip igmp ssm-map enable
!
no file verify auto
!
spanning-tree mode rapid-pvst
spanning-tree portfast bpduguard default
spanning-tree extend system-id
no spanning-tree vlan 800,808,900,908
power redundancy-mode redundant
!
!
!
process-max-time 20
vlan internal allocation policy ascending
!
vlan 90
name VLAN_90_HSD
!
vlan 110
name VLAN_110_Video
!

```

```

vlan 111
  name VLAN_111_VoIP
!
vlan 800
  name VLAN_800_VoIP_to/from_DER
!
vlan 808
  name VLAN_808_VoIP_to/from_AR2
!
vlan 900
  name VLAN_900_Video_to/from_DER
!
vlan 908
  name VLAN_908_Video_to/from_AR2
!
class-map match-all class_VoIP
  match access-group name acl_VoIP
class-map match-all class_VoD_signaling
  match access-group name acl_VoD_signaling
class-map match-all class_HSD
  match access-group name acl_HSD
!
!
policy-map setDSCP
  description Mark DSCP values for ingress traffic
  class class_VoIP
    set dscp ef
  class class_HSD
    set dscp default
  class class_VoD_signaling
    set dscp cs3
!
!
interface Tunnel0
  description Tx-side of Rx-only Gig3/3
  no ip address
  tunnel source 10.10.10.2
  tunnel destination 10.10.10.1
  tunnel udlr send-only GigabitEthernet3/3
  tunnel udlr address-resolution
!
interface Tunnel4
  description Tx-side of Rx-only Gig3/4
  no ip address
  tunnel source 10.10.10.6
  tunnel destination 10.10.10.5
  tunnel udlr send-only GigabitEthernet3/4
  tunnel udlr address-resolution
!
interface Tunnel8
  description Tx-side of Rx-only Gig3/5
  no ip address
  tunnel source 10.10.10.10
  tunnel destination 10.10.10.9
  tunnel udlr send-only GigabitEthernet3/5
  tunnel udlr address-resolution
!
interface Tunnel12
  description Tx-side of Rx-only Gig3/6
  no ip address
  tunnel source 10.10.10.14
  tunnel destination 10.10.10.13
  tunnel udlr send-only GigabitEthernet3/6
  tunnel udlr address-resolution

```



```
!  
interface Tunnel24  
  description Rx-side of Tx-only Gig4/4  
  no ip address  
  tunnel source 10.10.10.25  
  tunnel destination 10.10.10.26  
  tunnel udlr receive-only GigabitEthernet4/4  
!  
interface Tunnel28  
  description Rx-side of Tx-only Gig4/5  
  no ip address  
  tunnel source 10.10.10.29  
  tunnel destination 10.10.10.30  
  tunnel udlr receive-only GigabitEthernet4/5  
!  
interface Loopback0  
  description Endpoint for Tunnel0  
  ip address 10.10.10.2 255.255.255.255  
!  
interface Loopback4  
  description Endpoint for Tunnel4  
  ip address 10.10.10.6 255.255.255.255  
!  
interface Loopback8  
  description Endpoint for Tunnel8  
  ip address 10.10.10.10 255.255.255.255  
!  
interface Loopback12  
  description Endpoint for Tunnel12  
  ip address 10.10.10.14 255.255.255.255  
!  
interface Loopback24  
  description Endpoint for Tunnel24  
  ip address 10.10.10.25 255.255.255.255  
!  
interface Loopback28  
  description Endpoint for Tunnel28  
  ip address 10.10.10.29 255.255.255.255  
!  
interface FastEthernet1  
  no ip address  
  speed auto  
  duplex auto  
!  
interface GigabitEthernet1/1  
!  
interface GigabitEthernet1/2  
!  
interface GigabitEthernet3/1  
  description Transport to/from DER (Gig7/1)  
  switchport trunk encapsulation dot1q  
  switchport trunk allowed vlan 90,800,900  
  switchport mode trunk  
  dampening  
  load-interval 30  
  carrier-delay msec 0  
  qos trust dscp  
  tx-queue 1  
    bandwidth percent 19  
  tx-queue 2  
    bandwidth percent 80  
  tx-queue 3  
    priority high  
  tx-queue 4
```

```

        bandwidth percent 1
    !
interface GigabitEthernet3/2
!
interface GigabitEthernet3/3
description Transport from DER (Gig7/3)
no switchport
dampening
ip address 192.168.253.2 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed nonegotiate
qos trust dscp
unidirectional receive-only
!
interface GigabitEthernet3/4
description Transport from DER (Gig7/4)
no switchport
dampening
ip address 192.168.253.6 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed nonegotiate
qos trust dscp
unidirectional receive-only
!
interface GigabitEthernet3/5
description Transport from DER (Gig7/5)
no switchport
dampening
ip address 192.168.253.10 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed nonegotiate
qos trust dscp
unidirectional receive-only
!
interface GigabitEthernet3/6
description Transport from DER (Gig7/6)
no switchport
dampening
ip address 192.168.253.14 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed nonegotiate
qos trust dscp
unidirectional receive-only
!
interface GigabitEthernet4/1
!
interface GigabitEthernet4/2
!
interface GigabitEthernet4/3
description Transport to/from AR2 (Gig1/1)
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 90,808,908

```

```
switchport mode trunk
dampening
load-interval 30
carrier-delay msec 0
qos trust dscp
tx-queue 1
    bandwidth percent 19
tx-queue 2
    bandwidth percent 80
tx-queue 3
    priority high
tx-queue 4
    bandwidth percent 1
!
interface GigabitEthernet4/4
description Transport to AR2 (Gig1/2)
no switchport
dampening
ip address 192.168.253.25 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed negotiate
qos trust dscp
tx-queue 1
    bandwidth percent 19
tx-queue 2
    bandwidth percent 80
tx-queue 3
    priority high
tx-queue 4
    bandwidth percent 1
unidirectional send-only
!
interface GigabitEthernet4/5
description Transport to AR2 (Gig1/3)
no switchport
dampening
ip address 192.168.253.29 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed negotiate
qos trust dscp
tx-queue 1
    bandwidth percent 19
tx-queue 2
    bandwidth percent 80
tx-queue 3
    priority high
tx-queue 4
    bandwidth percent 1
unidirectional send-only
!
interface GigabitEthernet4/6
!
interface GigabitEthernet5/1
description GigE trunk to/from DSLAM uplink GigE
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 90,110,111
switchport mode trunk
switchport block unicast
```

```

service-policy input setDSCP
load-interval 30
tx-queue 1
    bandwidth percent 19
tx-queue 2
    bandwidth percent 80
tx-queue 3
    priority high
tx-queue 4
    bandwidth percent 1
no cdp enable
spanning-tree portfast trunk
!
interface GigabitEthernet5/2
!
interface GigabitEthernet5/3
!
interface GigabitEthernet5/4
!
interface GigabitEthernet5/5
!
interface GigabitEthernet5/6
!
interface Vlan1
no ip address
!
interface Vlan110
description Video edge VLAN
ip address 192.168.110.1 255.255.255.0
no ip redirects
no ip unreachable
ip pim sparse-mode
ip igmp static-group 232.1.1.1 source ssm-map
ip igmp static-group 232.1.1.2 source ssm-map
ip igmp static-group 232.1.1.3 source ssm-map
ip igmp static-group 232.1.1.4 source ssm-map
ip igmp static-group 232.1.1.5 source ssm-map
ip igmp static-group 232.1.1.6 source ssm-map
ip igmp static-group 232.1.1.7 source ssm-map
ip igmp static-group 232.1.1.8 source ssm-map
ip igmp static-group 232.1.1.9 source ssm-map
ip igmp static-group 232.1.1.10 source ssm-map
load-interval 30
arp timeout 250
!
interface Vlan111
description VoIP edge VLAN
ip address 192.168.111.1 255.255.255.0
no ip redirects
no ip unreachable
load-interval 30
!
interface Vlan800
description VoIP transport to/from DER
ip address 192.168.252.2 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
!
interface Vlan808
description VoIP transport to/from AR2
ip address 192.168.252.9 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1

```

```
load-interval 30
!
interface Vlan900
description Video transport to/from DER
ip address 192.168.254.2 255.255.255.252
ip pim sparse-mode
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
!
interface Vlan908
description Video transport to/from AR2
ip address 192.168.254.9 255.255.255.252
ip pim sparse-mode
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
!
router ospf 100
router-id 2.2.2.1
log-adjacency-changes
timers throttle spf 10 100 1000
timers throttle lsa all 1 10 1000
timers lsa arrival 100
network 10.10.10.0 0.0.0.255 area 0
network 192.168.254.0 0.0.0.255 area 0
maximum-paths 8
!
router ospf 101
router-id 2.2.2.2
log-adjacency-changes
timers throttle spf 10 100 1000
timers throttle lsa all 1 10 1000
timers lsa arrival 100
passive-interface Vlan111
network 192.168.111.0 0.0.0.255 area 0
network 192.168.252.0 0.0.0.255 area 0
maximum-paths 8
!
router ospf 102
router-id 2.2.2.3
log-adjacency-changes
timers throttle spf 10 100 1000
timers throttle lsa all 1 10 1000
timers lsa arrival 100
passive-interface Vlan110
network 192.168.110.0 0.0.0.255 area 0
network 192.168.253.0 0.0.0.255 area 0
maximum-paths 8
!
no ip http server
!
ip pim ssm default
!
ip access-list extended acl_HSD
remark Identify HSD traffic
permit ip 192.168.90.0 0.0.0.255 any
ip access-list extended acl_VoD_signaling
remark Identify VoD signaling traffic
permit ip 192.168.110.0 0.0.0.255 192.168.10.102
permit ip 192.168.110.0 0.0.0.255 192.168.10.103
ip access-list extended acl_VoIP
remark Identify VoIP traffic
permit ip 192.168.111.0 0.0.0.255 any
```

```
!  
logging trap debugging  
logging source-interface Vlan110  
logging 192.168.10.101  
!  
!  
!  
line con 0  
  exec-timeout 0 0  
  password cisco123  
  logging synchronous  
  login  
line vty 0 4  
  exec-timeout 0 0  
  password cisco123  
  logging synchronous  
  login  
!  
!  
scheduler runtime netinput 100  
no scheduler max-sched-time  
ntp clock-period 17179583  
ntp update-calendar  
ntp server 192.168.10.102 prefer  
!  
end
```

Configuration for AR2

```
upgrade fpd auto
version 12.2
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
service counters max age 10
!
hostname AR2
!
boot system disk0:s72033-adventerprisek9_wan-mz.122-18.SXE1.bin
enable password cisco123
!
no aaa new-model
clock timezone PST -8
clock summer-time PDT recurring
ip subnet-zero
!
!
!
ip multicast-routing
ip igmp ssm-map enable
ip domain multicast coronado.net
no ip domain-lookup
ip name-server 192.168.10.101
ip name-server 192.168.11.101
ipv6 mfib hardware-switching replication-mode ingress
vtp mode transparent
mls ip cef load-sharing full
mls ip multicast flow-stat-timer 9
no mls flow ip
no mls flow ipv6
mls qos map dscp-cos 36 to 2
mls qos map dscp-cos 38 to 1
mls qos
mls rate-limit unicast cef receive 100 10
no mls acl tcam share-global
mls cef error action freeze
no scripting tcl init
no scripting tcl encdir
!
!
!
!
!
!
!
!
!
!
!
!
redundancy
mode sso
main-cpu
auto-sync running-config
!
spanning-tree mode rapid-pvst
spanning-tree portfast bpdu-guard default
no spanning-tree optimize bpdu transmission
no spanning-tree vlan 808,812,908,912
!
power redundancy-mode combined
diagnostic cns publish cisco.cns.device.diag_results
```

```

diagnostic cns subscribe cisco.cns.device.diag_commands
!
vlan internal allocation policy ascending
vlan access-log ratelimit 2000
!
vlan 90
  name VLAN_90_HSD
!
vlan 120
  name VLAN_120_Video
!
vlan 121
  name VLAN_121_VoIP
!
vlan 808
  name VLAN_808_VoIP_to/from_AR1
!
vlan 812
  name VLAN_812_VoIP_to/from_AR3
!
vlan 908
  name VLAN_908_Video_to/from_AR1
!
vlan 912
  name VLAN_912_Video_to/from_AR3
!
class-map match-all class_VoIP
  match access-group name acl_VoIP
class-map match-all class_VoD_signaling
  match access-group name acl_VoD_signaling
class-map match-all class_HSD
  match access-group name acl_HSD
!
!
policy-map setDSCP
  description Mark DSCP values for ingress traffic
  class class_VoIP
    set dscp ef
  class class_HSD
    set dscp default
  class class_VoD_signaling
    set dscp cs3
!
!
!
interface Loopback24
  description Endpoint for Tunnel24
  ip address 10.10.10.26 255.255.255.255
!
interface Loopback28
  description Endpoint for Tunnel28
  ip address 10.10.10.30 255.255.255.255
!
interface Loopback36
  description Endpoint for Tunnel36
  ip address 10.10.10.38 255.255.255.255
!
interface Loopback40
  description Endpoint for Tunnel40
  ip address 10.10.10.42 255.255.255.255
!
interface Tunnel24
  description Tx-side of Rx-only Gig1/2
  no ip address

```



```
tunnel source 10.10.10.26
tunnel destination 10.10.10.25
tunnel udldr send-only GigabitEthernet1/2
tunnel udldr address-resolution
!
interface Tunnel28
description Tx-side of Rx-only Gig1/3
no ip address
tunnel source 10.10.10.30
tunnel destination 10.10.10.29
tunnel udldr send-only GigabitEthernet1/3
tunnel udldr address-resolution
!
interface Tunnel36
description Tx-side of Rx-only Gig1/6
no ip address
tunnel source 10.10.10.38
tunnel destination 10.10.10.37
tunnel udldr send-only GigabitEthernet1/6
tunnel udldr address-resolution
!
interface Tunnel40
description Tx-side of Rx-only Gig1/7
no ip address
tunnel source 10.10.10.42
tunnel destination 10.10.10.41
tunnel udldr send-only GigabitEthernet1/7
tunnel udldr address-resolution
!
interface GigabitEthernet1/1
description Transport to/from AR1 (Gig4/3)
switchport
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 90,808,908
switchport mode trunk
no ip address
load-interval 30
carrier-delay msec 0
wrr-queue bandwidth 64 255
wrr-queue queue-limit 40 50
wrr-queue random-detect min-threshold 1 75 100
wrr-queue random-detect min-threshold 2 50 100
wrr-queue random-detect max-threshold 1 100 100
wrr-queue random-detect max-threshold 2 50 100
wrr-queue cos-map 1 1 0
wrr-queue cos-map 2 1 1
wrr-queue cos-map 2 2 2 3 4 6 7
mls qos trust dscp
!
interface GigabitEthernet1/2
description Transport from AR1 (Gig4/4)
dampening
ip address 192.168.253.26 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed nonegotiate
wrr-queue bandwidth 64 255
wrr-queue queue-limit 40 50
wrr-queue random-detect min-threshold 1 75 100
wrr-queue random-detect min-threshold 2 50 100
wrr-queue random-detect max-threshold 1 100 100
wrr-queue random-detect max-threshold 2 50 100
```

```

wrr-queue cos-map 1 1 0
wrr-queue cos-map 2 1 1
wrr-queue cos-map 2 2 2 3 4 6 7
mls qos trust dscp
unidirectional receive-only
!
interface GigabitEthernet1/3
description Transport from AR1 (Gig4/5)
dampening
ip address 192.168.253.30 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed nonegotiate
wrr-queue bandwidth 64 255
wrr-queue queue-limit 40 50
wrr-queue random-detect min-threshold 1 75 100
wrr-queue random-detect min-threshold 2 50 100
wrr-queue random-detect max-threshold 1 100 100
wrr-queue random-detect max-threshold 2 50 100
wrr-queue cos-map 1 1 0
wrr-queue cos-map 2 1 1
wrr-queue cos-map 2 2 2 3 4 6 7
mls qos trust dscp
unidirectional receive-only
!
interface GigabitEthernet1/4
!
interface GigabitEthernet1/5
description Transport to/from AR3 (Gig4/3)
switchport
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 90,812,912
switchport mode trunk
dampening
no ip address
load-interval 30
carrier-delay msec 0
wrr-queue bandwidth 64 255
wrr-queue queue-limit 40 50
wrr-queue random-detect min-threshold 1 75 100
wrr-queue random-detect min-threshold 2 50 100
wrr-queue random-detect max-threshold 1 100 100
wrr-queue random-detect max-threshold 2 50 100
wrr-queue cos-map 1 1 0
wrr-queue cos-map 2 1 1
wrr-queue cos-map 2 2 2 3 4 6 7
mls qos trust dscp
spanning-tree cost 10
!
interface GigabitEthernet1/6
description Transport from AR3 (Gig4/4)
dampening
ip address 192.168.253.38 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed nonegotiate
wrr-queue bandwidth 64 255
wrr-queue queue-limit 40 50
wrr-queue random-detect min-threshold 1 75 100
wrr-queue random-detect min-threshold 2 50 100

```

```

wrr-queue random-detect max-threshold 1 100 100
wrr-queue random-detect max-threshold 2 50 100
wrr-queue cos-map 1 1 0
wrr-queue cos-map 2 1 1
wrr-queue cos-map 2 2 2 3 4 6 7
mls qos trust dscp
unidirectional receive-only
!
interface GigabitEthernet1/7
description Transport from AR3 (Gig4/5)
dampening
ip address 192.168.253.42 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed nonegotiate
wrr-queue bandwidth 64 255
wrr-queue queue-limit 40 50
wrr-queue random-detect min-threshold 1 75 100
wrr-queue random-detect min-threshold 2 50 100
wrr-queue random-detect max-threshold 1 100 100
wrr-queue random-detect max-threshold 2 50 100
wrr-queue cos-map 1 1 0
wrr-queue cos-map 2 1 1
wrr-queue cos-map 2 2 2 3 4 6 7
mls qos trust dscp
unidirectional receive-only
!
interface GigabitEthernet1/8
no ip address
shutdown
!
interface GigabitEthernet1/9
no ip address
shutdown
!
! <----- interfaces GigabitEthernet1/10 - 14 omitted ----->!
!
interface GigabitEthernet1/15
no ip address
shutdown
!
interface GigabitEthernet1/16
no ip address
shutdown
!
interface GigabitEthernet2/1
description Ericsson DSLAM
switchport
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 90,120,121
switchport mode trunk
switchport block unicast
no ip address
load-interval 30
wrr-queue bandwidth 64 255 0
wrr-queue queue-limit 40 50 0
wrr-queue threshold 1 100 100 100 100 100 100 100 100
wrr-queue threshold 2 50 100 100 100 100 100 100 100
wrr-queue random-detect min-threshold 1 75 100 100 100 100 100 100 100
wrr-queue random-detect max-threshold 1 100 100 100 100 100 100 100 100
no wrr-queue random-detect 2
wrr-queue cos-map 2 1 1

```

```

wrr-queue cos-map 2 2 2 3 4 6 7
no cdp enable
spanning-tree portfast trunk
service-policy input setDSCP
!
interface GigabitEthernet2/2
no ip address
shutdown
!
interface GigabitEthernet2/3
no ip address
shutdown
!
! <----- interfaces GigabitEthernet1/10 - 14 omitted ----->!
!
!
interface GigabitEthernet2/23
no ip address
shutdown
!
interface GigabitEthernet2/24
no ip address
shutdown
!
interface GigabitEthernet5/1
no ip address
shutdown
!
interface GigabitEthernet5/2
no ip address
shutdown
!
interface Vlan1
no ip address
shutdown
!
interface Vlan120
description Video edge VLAN
ip address 192.168.120.1 255.255.255.0
no ip redirects
no ip unreachable
ip pim sparse-mode
ip igmp static-group 232.1.1.1 source ssm-map
ip igmp static-group 232.1.1.2 source ssm-map
ip igmp static-group 232.1.1.3 source ssm-map
ip igmp static-group 232.1.1.4 source ssm-map
ip igmp static-group 232.1.1.5 source ssm-map
ip igmp static-group 232.1.1.6 source ssm-map
ip igmp static-group 232.1.1.7 source ssm-map
ip igmp static-group 232.1.1.8 source ssm-map
ip igmp static-group 232.1.1.9 source ssm-map
ip igmp static-group 232.1.1.10 source ssm-map
ip igmp static-group 232.1.1.11 source ssm-map
load-interval 30
arp timeout 250
!
interface Vlan121
description VoIP edge VLAN
ip address 192.168.121.1 255.255.255.0
no ip redirects
no ip unreachable
load-interval 30
!

```

```
interface Vlan808
  description VoIP transport VLAN to/from AR1
  ip address 192.168.252.10 255.255.255.252
  ip ospf network point-to-point
  ip ospf hello-interval 1
  load-interval 30
!
interface Vlan812
  description VoIP transport VLAN to/from AR3
  ip address 192.168.252.14 255.255.255.252
  ip ospf network point-to-point
  ip ospf hello-interval 1
  load-interval 30
!
interface Vlan908
  description Video transport VLAN to/from AR1
  ip address 192.168.254.10 255.255.255.252
  ip pim sparse-mode
  ip ospf network point-to-point
  ip ospf hello-interval 1
  load-interval 30
!
interface Vlan912
  description Video transport VLAN to/from AR3
  ip address 192.168.254.14 255.255.255.252
  ip pim sparse-mode
  ip ospf network point-to-point
  ip ospf hello-interval 1
  load-interval 30
!
router ospf 100
  router-id 3.3.3.1
  log-adjacency-changes
  timers throttle spf 10 100 1000
  timers throttle lsa all 1 10 1000
  timers lsa arrival 100
  network 10.10.10.0 0.0.0.255 area 0
  network 192.168.254.0 0.0.0.255 area 0
  maximum-paths 8
!
router ospf 101
  router-id 3.3.3.2
  log-adjacency-changes
  timers throttle spf 10 100 1000
  timers throttle lsa all 1 10 1000
  timers lsa arrival 100
  passive-interface Vlan121
  network 192.168.121.0 0.0.0.255 area 0
  network 192.168.252.0 0.0.0.255 area 0
  maximum-paths 8
!
router ospf 102
  router-id 3.3.3.3
  log-adjacency-changes
  timers throttle spf 10 100 1000
  timers throttle lsa all 1 10 1000
  timers lsa arrival 100
  passive-interface Vlan120
  network 192.168.120.0 0.0.0.255 area 0
  network 192.168.253.0 0.0.0.255 area 0
  maximum-paths 8
!
ip classless
!
```

```
no ip http server
ip pim ssm default
!
ip access-list extended acl_HSD
 remark Identify HSD traffic
 permit ip 192.168.90.0 0.0.0.255 any
ip access-list extended acl_VoD_signaling
 remark Identify VoD signaling traffic
 permit ip 192.168.120.0 0.0.0.255 192.168.10.102
 permit ip 192.168.120.0 0.0.0.255 192.168.10.103
ip access-list extended acl_VoIP
 remark Identify VoIP traffic
 permit ip 192.168.121.0 0.0.0.255 any
!
logging trap debugging
logging source-interface Vlan120
logging 192.168.10.101
!
!
!
control-plane
!
!
!
dial-peer cor custom
!
!
!
line con 0
 exec-timeout 0 0
 password cisco123
 logging synchronous
 login
line vty 0 4
 exec-timeout 0 0
 password cisco123
 logging synchronous
 login
!
!
ntp clock-period 17179835
ntp update-calendar
ntp server 192.168.10.102 prefer
no cns aaa enable
end
```

Configuration for AR3

```
version 12.2
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
service compress-config
!
hostname AR3
!
boot-start-marker
boot system bootflash:cat4000-i5s-mz.122-25.EWA.bin
boot-end-marker
!
!
redundancy
mode sso
main-cpu
auto-sync standard
enable password cisco123
!
no aaa new-model
clock timezone PST -8
clock summer-time PDT recurring
qos map dscp 38 to cos 1
qos map dscp 36 to cos 2
qos
vtp mode transparent
ip subnet-zero
ip cef load-sharing algorithm include-ports destination
ip domain multicast coronado.net
no ip domain-lookup
ip name-server 192.168.10.101
ip name-server 192.168.11.101
!
ip multicast-routing
ip igmp ssm-map enable
!
no file verify auto
!
spanning-tree mode rapid-pvst
spanning-tree portfast bpduguard default
spanning-tree extend system-id
no spanning-tree vlan 812,816,912,916
power redundancy-mode redundant
!
!
!
vlan internal allocation policy ascending
!
!
vlan 90
name VLAN_90_HSD
!
vlan 130
name VLAN_130_Video
!
vlan 131
name VLAN_131_VoIP
!
vlan 812
name VLAN_812_VoIP_to/from_AR2
```

```

!
vlan 816
 name VLAN_816_VoIP_to/from_DER
!
vlan 912
 name VLAN_912_Video_to/from_AR2
!
vlan 916
 name VLAN_916_Video_to/from_DER
!
class-map match-all class_VoIP
 match access-group name acl_VoIP
class-map match-all class_VoD_signaling
 match access-group name acl_VoD_signaling
class-map match-all class_HSD
 match access-group name acl_HSD
!
!
policy-map setDSCP
 description Mark DSCP values for ingress traffic
 class class_VoIP
  set dscp ef
 class class_HSD
  set dscp default
 class class_VoD_signaling
  set dscp cs3
!
!
interface Tunnel36
 description Rx-side of Tx-only Gig4/4
 no ip address
 tunnel source 10.10.10.37
 tunnel destination 10.10.10.38
 tunnel udld receive-only GigabitEthernet4/4
!
interface Tunnel40
 description Rx-side of Tx-only Gig4/5
 no ip address
 tunnel source 10.10.10.41
 tunnel destination 10.10.10.42
 tunnel udld receive-only GigabitEthernet4/5
!
!
interface Tunnel48
 description Tx-side of Rx-only Gig3/3
 no ip address
 tunnel source 10.10.10.50
 tunnel destination 10.10.10.49
 tunnel udld send-only GigabitEthernet3/3
 tunnel udld address-resolution
!
interface Tunnel52
 description Tx-side of Rx-only Gig3/4
 no ip address
 tunnel source 10.10.10.54
 tunnel destination 10.10.10.53
 tunnel udld send-only GigabitEthernet3/4
 tunnel udld address-resolution
!
interface Tunnel56
 description Tx-side of Rx-only Gig3/5
 no ip address
 tunnel source 10.10.10.58
 tunnel destination 10.10.10.57

```



```
tunnel udld send-only GigabitEthernet3/5
tunnel udld address-resolution
!
interface Tunnel60
description Tx-side of Rx-only Gig3/6
no ip address
tunnel source 10.10.10.62
tunnel destination 10.10.10.61
tunnel udld send-only GigabitEthernet3/6
tunnel udld address-resolution
!
interface Loopback36
description Endpoint for Tunnel36
ip address 10.10.10.37 255.255.255.255
!
interface Loopback40
description Endpoint for Tunnel40
ip address 10.10.10.41 255.255.255.255
!
interface Loopback48
description Endpoint for Tunnel48
ip address 10.10.10.50 255.255.255.255
!
interface Loopback52
description Endpoint for Tunnel52
ip address 10.10.10.54 255.255.255.255
!
interface Loopback56
description Endpoint for Tunnel56
ip address 10.10.10.58 255.255.255.255
!
interface Loopback60
description Endpoint for Tunnel60
ip address 10.10.10.62 255.255.255.255
!
interface FastEthernet1
no ip address
shutdown
speed auto
duplex auto
!
interface GigabitEthernet1/1
!
interface GigabitEthernet1/2
!
interface GigabitEthernet3/1
description Transport to/from DER (Gig7/9)
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 90,816,916
switchport mode trunk
load-interval 30
qos trust dscp
tx-queue 1
    bandwidth percent 19
tx-queue 2
    bandwidth percent 80
tx-queue 3
    priority high
tx-queue 4
    bandwidth percent 1
!
interface GigabitEthernet3/2
!
interface GigabitEthernet3/3
```

```

description Transport from DER (Gig7/11)
no switchport
dampening
ip address 192.168.253.50 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed nonegotiate
unidirectional receive-only
!
interface GigabitEthernet3/4
description Transport from DER (Gig7/12)
no switchport
dampening
ip address 192.168.253.54 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed nonegotiate
unidirectional receive-only
!
interface GigabitEthernet3/5
description Transport from DER (Gig7/13)
no switchport
dampening
ip address 192.168.253.58 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed nonegotiate
qos trust dscp
unidirectional receive-only
!
interface GigabitEthernet3/6
description Transport from DER (Gig7/14)
no switchport
dampening
ip address 192.168.253.62 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
carrier-delay msec 0
speed nonegotiate
qos trust dscp
unidirectional receive-only
!
interface GigabitEthernet4/1
!
interface GigabitEthernet4/2
!
interface GigabitEthernet4/3
description Transport to/from AR2 (Gig1/5)
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 90,812,912
switchport mode trunk
load-interval 30
qos trust dscp
tx-queue 1
    bandwidth percent 19
tx-queue 2
    bandwidth percent 80

```

```
tx-queue 3
  priority high
tx-queue 4
  bandwidth percent 1
spanning-tree cost 10
!
interface GigabitEthernet4/4
description Transport to AR2 (Gig1/6)
no switchport
ip address 192.168.253.37 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
speed nonegotiate
qos trust dscp
tx-queue 1
  bandwidth percent 19
tx-queue 2
  bandwidth percent 80
tx-queue 3
  priority high
tx-queue 4
  bandwidth percent 1
unidirectional send-only
!
interface GigabitEthernet4/5
description Transport to AR2 (Gig1/7)
no switchport
ip address 192.168.253.41 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
load-interval 30
speed nonegotiate
qos trust dscp
tx-queue 1
  bandwidth percent 19
tx-queue 2
  bandwidth percent 80
tx-queue 3
  priority high
tx-queue 4
  bandwidth percent 1
unidirectional send-only
!
interface GigabitEthernet4/6
!
interface GigabitEthernet5/1
description GigE trunk to/from DSLAM uplink GigE
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 90,130,131
switchport mode trunk
switchport block unicast
service-policy input setDSCP
load-interval 30
tx-queue 1
  bandwidth percent 19
tx-queue 2
  bandwidth percent 80
tx-queue 3
  priority high
tx-queue 4
  bandwidth percent 1
no cdp enable
spanning-tree portfast trunk
```

```

!
interface GigabitEthernet5/2
!
interface GigabitEthernet5/3
!
interface GigabitEthernet5/4
!
interface GigabitEthernet5/5
!
interface GigabitEthernet5/6
!
interface Vlan1
no ip address
!
interface Vlan130
description Video edge VLAN
ip address 192.168.130.1 255.255.255.0
no ip redirects
no ip unreachable
ip pim sparse-mode
ip igmp static-group 232.1.1.1 source ssm-map
ip igmp static-group 232.1.1.2 source ssm-map
ip igmp static-group 232.1.1.3 source ssm-map
ip igmp static-group 232.1.1.4 source ssm-map
ip igmp static-group 232.1.1.5 source ssm-map
ip igmp static-group 232.1.1.6 source ssm-map
ip igmp static-group 232.1.1.7 source ssm-map
ip igmp static-group 232.1.1.8 source ssm-map
ip igmp static-group 232.1.1.9 source ssm-map
ip igmp static-group 232.1.1.10 source ssm-map
load-interval 30
arp timeout 250
!
interface Vlan131
description VoIP edge VLAN
ip address 192.168.131.1 255.255.255.0
no ip redirects
no ip unreachable
load-interval 30
!
interface Vlan812
description VoIP transport to/from AR2
ip address 192.168.252.13 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
!
interface Vlan816
description VoIP transport to/from DER
ip address 192.168.252.18 255.255.255.252
ip ospf network point-to-point
ip ospf hello-interval 1
!
interface Vlan912
description Video transport to/from AR2
ip address 192.168.254.13 255.255.255.252
ip pim sparse-mode
ip ospf network point-to-point
ip ospf hello-interval 1
!
interface Vlan916
description Video transport to/from DER
ip address 192.168.254.18 255.255.255.252
ip pim sparse-mode
ip ospf network point-to-point

```

```

ip ospf hello-interval 1
!
router ospf 100
router-id 4.4.4.1
log-adjacency-changes
timers throttle spf 10 100 1000
timers throttle lsa all 1 10 1000
timers lsa arrival 100
network 10.10.10.0 0.0.0.255 area 0
network 192.168.254.0 0.0.0.255 area 0
maximum-paths 8
!
router ospf 101
router-id 4.4.4.2
log-adjacency-changes
timers throttle spf 10 100 1000
timers throttle lsa all 1 10 1000
timers lsa arrival 100
passive-interface Vlan131
network 192.168.131.0 0.0.0.255 area 0
network 192.168.252.0 0.0.0.255 area 0
maximum-paths 8
!
router ospf 102
router-id 4.4.4.3
log-adjacency-changes
timers throttle spf 10 100 1000
timers throttle lsa all 1 10 1000
timers lsa arrival 100
passive-interface Vlan130
network 192.168.130.0 0.0.0.255 area 0
network 192.168.253.0 0.0.0.255 area 0
maximum-paths 8
!
no ip http server
!
ip pim ssm default
!
ip access-list extended acl_HSD
remark Identify HSD traffic
permit ip 192.168.90.0 0.0.0.255 any
ip access-list extended acl_VoD_signaling
remark Identify VoD signaling traffic
permit ip 192.168.130.0 0.0.0.255 192.168.10.102
permit ip 192.168.130.0 0.0.0.255 192.168.10.103
ip access-list extended acl_VoIP
remark Identify VoIP traffic
permit ip 192.168.131.0 0.0.0.255 any
!
logging trap debugging
logging source-interface Vlan130
logging 192.168.10.101
!
line con 0
exec-timeout 0 0
password cisco123
logging synchronous
login
line vty 0 4
exec-timeout 0 0
password cisco123
logging synchronous
login
!

```

■ Configuration for AR3

```
!  
ntp clock-period 17179522  
ntp update-calendar  
ntp server 192.168.10.102 prefer  
!  
end
```