

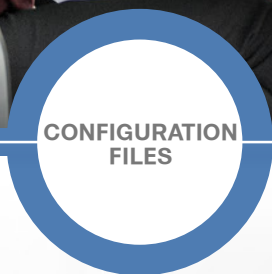


Newer Cisco SBA Guides Available

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

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





Telephony Using Cisco UCM Configuration Files Guide

● ● ● SMART BUSINESS ARCHITECTURE

August 2012 Series

Preface

Who Should Read This Guide

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

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

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

Release Series

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

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

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

month year Series

For example, the series of guides that we released in August 2012 are the “August 2012 Series”.

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

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

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

How to Read Commands

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

Commands to enter at a CLI appear as follows:

```
configure terminal
```

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

```
ntp server 10.10.48.17
```

Commands with variables that you must define appear as follows:

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

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

```
Router# enable
```

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

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

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

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

Comments and Questions

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

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

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What's In This SBA Guide

Cisco SBA Collaboration

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 Collaboration is a design incorporating unified communications, video collaboration, and web conferencing. By building upon the hierarchical model of network foundation, network services, and user services, Cisco SBA Collaboration provides dependable delivery of business applications and services.

Route to Success

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

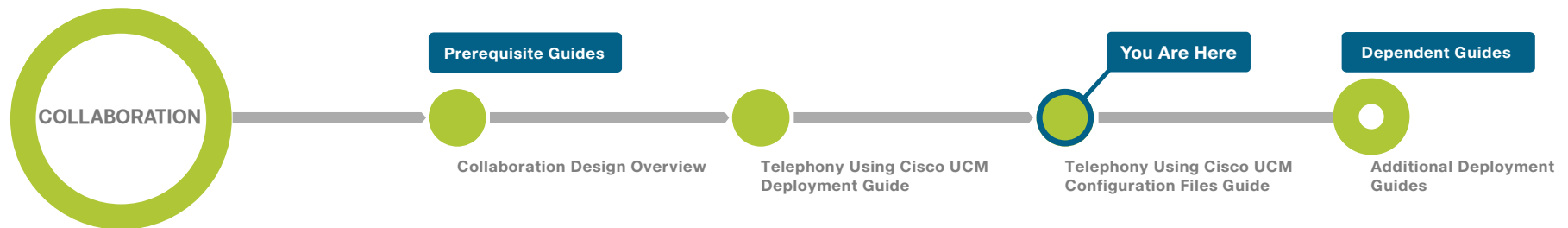
About This Guide

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

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

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

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



Introduction

For Cisco's partners and customers with up to 10,000 connected users, Cisco has designed an out-of-the-box deployment that is simple, fast, affordable, scalable, and flexible. It is designed to be easy—easy to configure, deploy, and manage.

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

This guide provides the available configuration files for the products used in the *Telephony Using Cisco UCM Deployment Guide* design. It includes the following configuration files:

- WAN headquarter routers
- WAN remote site routers

Products with browser-based graphical configuration tools are omitted from this guide. Please refer to the companion guide, *Telephony Using Cisco UCM Deployment Guide*, on Cisco.com for step-by-step instructions on configuring those products.

Refer to Appendix A for a list of products used in the lab testing of this design.

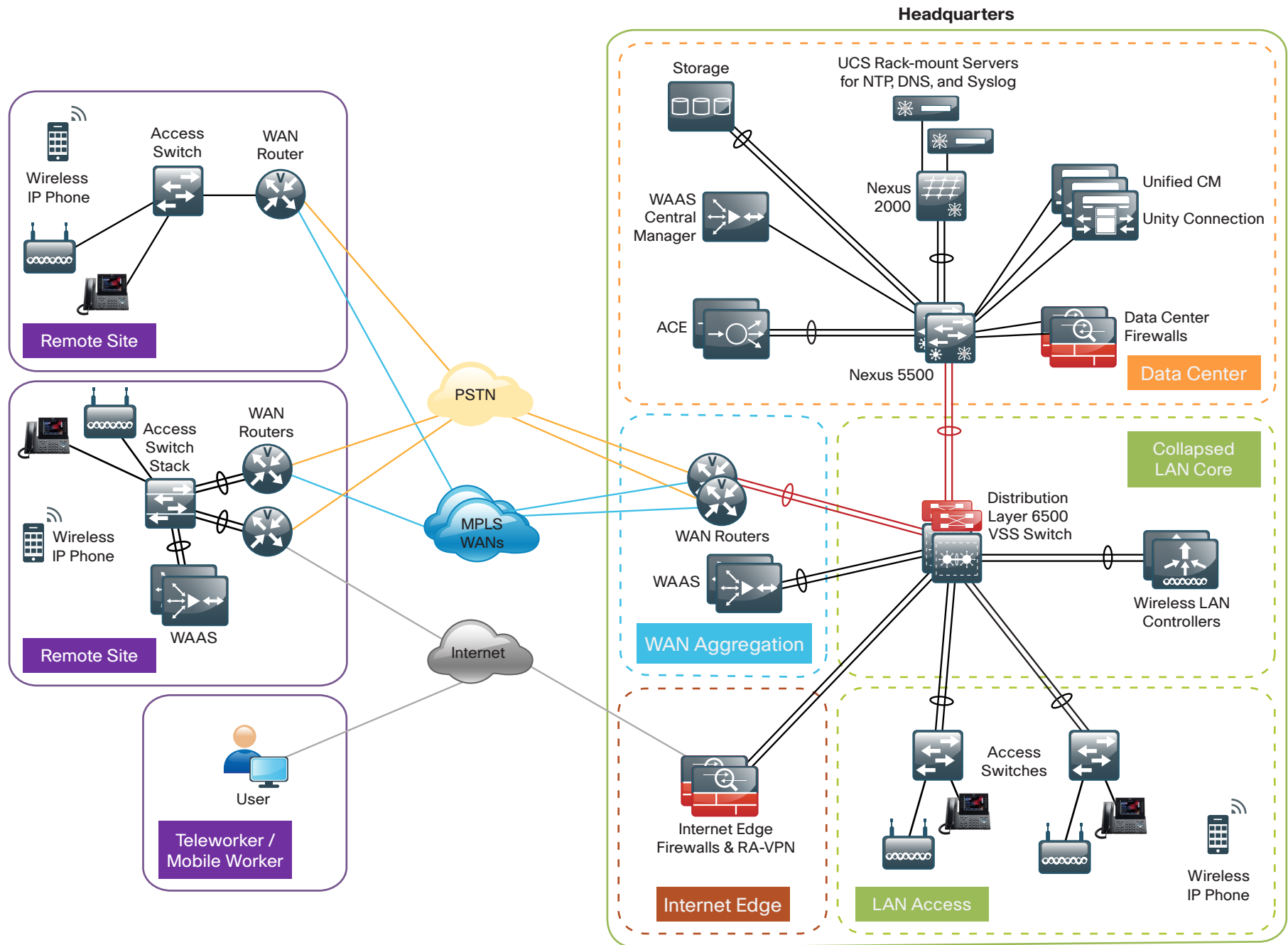


Tech Tip

The actual settings and values depend on your current network configuration. Please review all settings and configuration changes before submitting them.

Notes

Figure 1 - Network architecture baseline with unified communications



Wide-Area Network

Headquarters, Dual Standalone Voice Routers, Cisco ISR G2 3945

Cisco ISR G2 3945 is recommended for standalone voice routers with up to 18 T1/E1 public switched telephone network (PSTN) interfaces at the headquarters location. For smaller sites with 12 or fewer T1/E1 PSTN interfaces, Cisco ISR G2 3925 provides a lower-cost alternative, with a line-for-line equivalent configuration.

The router configurations shown here include multi-link Etherchannel connections for a resilient LAN deployment, and they use static IP routes. They also have dual T1 PRI interfaces with SIP dial peers connecting to four Cisco Unified Communications Manager (Unified CM) subscribers.

First Headquarters Cisco ISR G2 3945 Standalone Voice Router

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname HQ-3945-VG1
!
boot-start-marker
boot-end-marker
!
card type t1 0 0
enable secret 4 /DtCCr53Q4B18jSIm1UEqu7cNVZT0hxTZyUnZdsSrsW
!
aaa new-model
!
aaa group server tacacs+ TACACS-SERVERS
server name TACACS-SERVER-1
!
```

```
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
aaa session-id common
!
clock timezone PST -8 0
clock summer-time PDT recurring
network-clock-participate wic 0
!
no ipv6 cef
ip source-route
ip cef
!
ip multicast-routing
!
ip domain name cisco.local
!
multilink bundle-name authenticated
!
isdn switch-type primary-ni
!
voice-card 0
dspfarm
dsp services dspfarm
!
voice service voip
    fax protocol t38 version 0 ls-redundancy 0 hs-redundancy 0
    fallback none
sip
    bind control source-interface Port-channel1
    bind media source-interface Port-channel1
!
voice class codec 1
    codec preference 1 g711ulaw
    codec preference 2 g711alaw
    codec preference 3 g729r8
```

```

    codec preference 4 ilbc
!
license udi pid C3900-SPE150/K9 sn FOC133037J0
hw-module pvdm 0/0
!
username admin password 7 04585A150C2E1D1C5A
!
redundancy
!
controller T1 0/0/0
    cablelength short 110
    pri-group timeslots 1-24
    description PSTN PRI
!
controller T1 0/0/1
    cablelength short 110
    pri-group timeslots 1-24
    description PSTN PRI
!
controller T1 0/0/2
    cablelength long 0db
!
controller T1 0/0/3
    cablelength long 0db
!
ip ssh version 2
!
interface Port-channel1
    description EtherChannel link to DC5548UP
    ip address 10.4.48.138 255.255.255.0
    ip pim sparse-mode
!
interface Embedded-Service-Engine0/0
    no ip address
    shutdown
!
interface GigabitEthernet0/0

```

```

    description DC5548UP Eth106/1/5
    no ip address
    shutdown
    duplex auto
    speed auto
    channel-group 1
!
interface GigabitEthernet0/1
    description DC5548UP Eth107/1/5
    no ip address
    duplex auto
    speed auto
    channel-group 1
!
interface GigabitEthernet0/2
    no ip address
    shutdown
    duplex auto
    speed auto
!
interface Serial0/0/0:23
    no ip address
    encapsulation hdlc
    isdn switch-type primary-ni
    isdn incoming-voice voice
    no cdp enable
!
interface Serial0/0/1:23
    no ip address
    encapsulation hdlc
    isdn switch-type primary-ni
    isdn incoming-voice voice
    no cdp enable
!
ip forward-protocol nd
!
ip pim autorp listener

```

```

no ip http server
ip http authentication aaa
ip http secure-server
!
ip route 0.0.0.0 0.0.0.0 10.4.48.1
!
logging trap errors
logging 10.4.48.36
!
nls resp-timeout 1
cpd cr-id 1
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server chassis-id
tacacs server TACACS-SERVER-1
    address ipv4 10.4.48.15
    key 7 122A0014000E182F2F32
!
control-plane
!
voice-port 0/0/0:23
!
voice-port 0/0/1:23
!
ccm-manager sccp local Port-channel1
!
mgcp profile default
!
sccp local Port-channel1
sccp ccm 10.4.48.114 identifier 4 priority 4 version 7.0
sccp ccm 10.4.48.113 identifier 3 priority 3 version 7.0
sccp ccm 10.4.48.112 identifier 2 priority 2 version 7.0
sccp ccm 10.4.48.111 identifier 1 priority 1 version 7.0
sccp
!
sccp ccm group 1

```

```

bind interface Port-channel1
associate ccm 1 priority 1
associate ccm 2 priority 2
associate ccm 3 priority 3
associate ccm 4 priority 4
associate profile 1 register CFB1HQ1
switchback method graceful
switchback interval 60
!
dspfarm profile 1 conference
description HQ Conference Bridges
codec ilbc
codec g722-64
codec g711ulaw
codec g711alaw
codec g729ar8
codec g729abr8
codec g729r8
codec g729br8
maximum sessions 5
associate application SCCP
!
dial-peer voice 100 voip
description SIP TRUNK to SUB1
preference 1
destination-pattern 310610....
session protocol sipv2
session target ipv4:10.4.48.111
incoming called-number .
voice-class codec 1
!
dial-peer voice 101 voip
description SIP TRUNK to SUB2
preference 2
destination-pattern 310610....
session protocol sipv2
session target ipv4:10.4.48.112

```

```

incoming called-number .
voice-class codec 1
!
dial-peer voice 102 voip
description SIP TRUNK to SUB3
preference 3
destination-pattern 310610....
session protocol sipv2
session target ipv4:10.4.48.113
incoming called-number .
voice-class codec 1
!
dial-peer voice 103 voip
description SIP TRUNK to SUB4
preference 4
destination-pattern 310610....
session protocol sipv2
session target ipv4:10.4.48.114
incoming called-number .
voice-class codec 1
!
dial-peer voice 1911 pots
preference 1
destination-pattern 911
port 0/0/0:23
forward-digits 3
!
dial-peer voice 19911 pots
preference 1
destination-pattern 9911
port 0/0/0:23
forward-digits 3
!
dial-peer voice 17 pots
preference 1
destination-pattern 9[2-9].....
port 0/0/0:23

```

```

forward-digits 7
!
dial-peer voice 111 pots
preference 1
destination-pattern 91[2-9]..[2-9].....
port 0/0/0:23
forward-digits 11
!
dial-peer voice 19011 pots
preference 1
destination-pattern 9011T
incoming called-number .
direct-inward-dial
port 0/0/0:23
prefix 011
!
dial-peer voice 2911 pots
preference 2
destination-pattern 911
port 0/0/1:23
forward-digits 3
!
dial-peer voice 29911 pots
preference 2
destination-pattern 9911
port 0/0/1:23
forward-digits 3
!
dial-peer voice 27 pots
preference 2
destination-pattern 9[2-9].....
port 0/0/1:23
forward-digits 7
!
dial-peer voice 211 pots
preference 2
destination-pattern 91[2-9]..[2-9].....

```

```

port 0/0/1:23
forward-digits 11
!
dial-peer voice 29011 pots
  preference 2
  destination-pattern 9011T
  incoming called-number .
  direct-inward-dial
  port 0/0/1:23
  prefix 011
!
gatekeeper
  shutdown
!
line con 0
  logging synchronous
line aux 0
line 2
  no activation-character
  no exec
  transport preferred none
  transport input all
  transport output lat pad telnet rlogin lapb-ta mop udptn v120
ssh
  stopbits 1
line vty 0 4
  transport preferred none
  transport input ssh
line vty 5 15
  transport preferred none
  transport input ssh
!
scheduler allocate 20000 1000
ntp update-calendar
ntp server 10.4.48.17
end

```

Second Headquarters Cisco ISR G2 3945 Standalone Voice Router

```

version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname HQ-3945-VG2
!
boot-start-marker
boot-end-marker
!
card type t1 0 0
enable secret 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrs
!
aaa new-model
!
aaa group server tacacs+ TACACS-SERVERS
  server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
aaa session-id common
!
clock timezone PST -8 0
clock summer-time PDT recurring
network-clock-participate wic 0
!
no ipv6 cef
ip source-route
ip cef
!
ip multicast-routing
!
ip domain name cisco.local
!

```

```

multilink bundle-name authenticated
!
isdn switch-type primary-ni
!
voice-card 0
    dspfarm
    dsp services dspfarm
!
voice service voip
    fax protocol t38 version 0 ls-redundancy 0 hs-redundancy 0
    fallback none
    sip
        bind control source-interface Port-channel1
        bind media source-interface Port-channel1
!
voice class codec 1
    codec preference 1 g711ulaw
    codec preference 2 g711alaw
    codec preference 3 g729r8
    codec preference 4 ilbc
!
license udi pid C3900-SPE150/K9 sn FOC142356K1
hw-module pvdn 0/0
!
username admin password 7 08221D5D0A16544541
!
redundancy
!
controller T1 0/0/0
    cablelength short 110
    pri-group timeslots 1-24
    description PSTN PRI
!
controller T1 0/0/1
    cablelength short 110
    pri-group timeslots 1-24
    description PSTN PRI
!
controller T1 0/0/2

```

```

    cablelength long 0db
!
controller T1 0/0/3
    cablelength long 0db
!
ip ssh version 2
!
interface Port-channel1
    description EtherChannel link to DC5548UP
    ip address 10.4.48.139 255.255.255.0
    ip pim sparse-mode
    hold-queue 150 in
!
interface Embedded-Service-Engine0/0
    no ip address
    shutdown
!
interface GigabitEthernet0/0
    description DC2248TP-E Eth106/1/6
    no ip address
    duplex auto
    speed auto
    channel-group 1
!
interface GigabitEthernet0/1
    description DC2248TP-E Eth107/1/6
    no ip address
    duplex auto
    speed auto
    channel-group 1
!
interface GigabitEthernet0/2
    no ip address
    shutdown
    duplex auto
    speed auto
!
interface Serial0/0/0:23
    no ip address

```

```

encapsulation hdlc
isdn switch-type primary-ni
isdn incoming-voice voice
no cdp enable
!
interface Serial0/0/1:23
no ip address
encapsulation hdlc
isdn switch-type primary-ni
isdn incoming-voice voice
no cdp enable
!
ip forward-protocol nd
!
ip pim autorp listener
no ip http server
ip http authentication aaa
ip http secure-server
!
ip route 0.0.0.0 0.0.0.0 10.4.48.1
!
nls resp-timeout 1
cpd cr-id 1
!
snmp-server community cisco RO
snmp-server community cisco123 RW
tacacs server TACACS-SERVER-1
address ipv4 10.4.48.15
key 7 04680E051D2458650C00
!
control-plane
!
voice-port 0/0/0:23
!
voice-port 0/0/1:23
!
ccm-manager sccp local Port-channel1
!
mgcp profile default

```

```

!
sccp local Port-channel1
sccp ccm 10.4.48.114 identifier 4 priority 2 version 7.0
sccp ccm 10.4.48.113 identifier 3 priority 1 version 7.0
sccp ccm 10.4.48.112 identifier 2 priority 4 version 7.0
sccp ccm 10.4.48.111 identifier 1 priority 3 version 7.0
sccp
!
sccp ccm group 1
bind interface Port-channel1
associate ccm 3 priority 1
associate ccm 4 priority 2
associate ccm 1 priority 3
associate ccm 2 priority 4
associate profile 1 register CFB2HQ1
switchback method graceful
switchback interval 60
!
dspfarm profile 1 conference
description HQ Conference Bridges
codec ilbc
codec g722-64
codec g711ulaw
codec g711alaw
codec g729ar8
codec g729abr8
codec g729r8
codec g729br8
maximum sessions 5
associate application SCCP
!
dial-peer voice 100 voip
description SIP TRUNK to SUB1
preference 3
destination-pattern 310610....
session protocol sipv2
session target ipv4:10.4.48.111
incoming called-number .
voice-class codec 1

```

```

!
dial-peer voice 101 voip
  description SIP TRUNK to SUB2
  preference 4
  destination-pattern 310610....
  session protocol sipv2
  session target ipv4:10.4.48.112
  incoming called-number .
  voice-class codec 1
!
dial-peer voice 102 voip
  description SIP TRUNK to SUB3
  preference 1
  destination-pattern 310610....
  session protocol sipv2
  session target ipv4:10.4.48.113
  incoming called-number .
  voice-class codec 1
!
dial-peer voice 103 voip
  description SIP TRUNK to SUB4
  preference 2
  destination-pattern 310610....
  session protocol sipv2
  session target ipv4:10.4.48.114
  incoming called-number .
  voice-class codec 1
!
dial-peer voice 1911 pots
  preference 1
  destination-pattern 911
  port 0/0/0:23
  forward-digits 3
!
dial-peer voice 19911 pots
  preference 1
  destination-pattern 9911
  port 0/0/0:23
  forward-digits 3

```

```

!
dial-peer voice 17 pots
  preference 1
  destination-pattern 9[2-9].....
  port 0/0/0:23
  forward-digits 7
!
dial-peer voice 111 pots
  preference 1
  destination-pattern 91[2-9]..[2-9].....
  port 0/0/0:23
  forward-digits 11
!
dial-peer voice 19011 pots
  preference 1
  destination-pattern 9011T
  incoming called-number .
  direct-inward-dial
  port 0/0/0:23
  prefix 011
!
dial-peer voice 2911 pots
  preference 2
  destination-pattern 911
  port 0/0/1:23
  forward-digits 3
!
dial-peer voice 29911 pots
  preference 2
  destination-pattern 9911
  port 0/0/1:23
  forward-digits 3
!
dial-peer voice 27 pots
  preference 2
  destination-pattern 9[2-9].....
  port 0/0/1:23
  forward-digits 7
!

```

```

dial-peer voice 211 pots
  preference 2
  destination-pattern 91[2-9]..[2-9].....
  port 0/0/1:23
  forward-digits 11
!
dial-peer voice 29011 pots
  preference 2
  destination-pattern 9011T
  incoming called-number .
  direct-inward-dial
  port 0/0/1:23
  prefix 011
!
gatekeeper
  shutdown
!
line con 0
  logging synchronous
line aux 0
line 2
  no activation-character
  no exec
  transport preferred none
  transport input all
  transport output pad telnet rlogin lapb-ta mop udptn v120 ssh
  stopbits 1
line vty 0 4
  transport preferred none
  transport input ssh
line vty 5 15
  transport preferred none
  transport input ssh
!
scheduler allocate 20000 1000
ntp update-calendar
ntp server 10.4.48.17
end

```

Remote Site, Standalone Voice Router, Cisco ISR G2 3925, and Cisco ISR G2 2951

Cisco ISR G2 3925 is recommended as a standalone voice router for large, remote-site offices with up to 12 T1/E1 PSTN interfaces at the location. For sites with up to 8 T1/E1 PSTN interfaces, a standalone Cisco ISR G2 2951 provides a lower-cost alternative. For even smaller sites with fewer T1/E1 PSTN interfaces, the Cisco ISR 2921 and Cisco ISR 2911 configurations are listed in the next section.

The router configurations shown here include a multi-link Etherchannel connection for a resilient LAN deployment, and they use static IP routes. The remote site routers include the configuration commands to enable Survivable Remote Site Telephony (SRST). They also have a single T1 PRI interface with SIP dial peers connecting to four Cisco Unified CM subscribers.

Remote Site Cisco ISR G2 3925 Standalone Voice Router with SIP SRST

```

version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS206-3925-VG1
!
boot-start-marker
boot-end-marker
!
card type tl 0 0
enable secret 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrsW
!
aaa new-model
!
aaa group server tacacs+ TACACS-SERVERS
  server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local

```

```

!
aaa session-id common
!
clock timezone PST -8 0
clock summer-time PDT recurring
network-clock-participate wic 0
!
no ipv6 cef
ipv6 spd queue min-threshold 62
ipv6 spd queue max-threshold 63
ip source-route
ip cef
!
ip multicast-routing
!
ip domain name cisco.local
!
multilink bundle-name authenticated
!
isdn switch-type primary-ni
!
voice-card 0
    dspfarm
    dsp services dspfarm
!
voice service voip
    allow-connections sip to sip
    fax protocol t38 version 0 ls-redundancy 0 hs-redundancy 0
fallback none
    sip
        bind control source-interface Port-channel3
        bind media source-interface Port-channel3
        registrar server expires max 600 min 60
!
voice class codec 1
    codec preference 1 g711ulaw
    codec preference 2 g711alaw
    codec preference 3 g729r8

```

```

    codec preference 4 ilbc
!
voice register global
    system message "SIP SRST Service"
    max-dn 200
    max-pool 50
    dialplan-pattern 1 317617.... extension-length 8 extension-
pattern 8517....
!
voice register pool 1
    translation-profile incoming SRST-4-Digit
    id network 10.5.13.0 mask 255.255.255.0
    dtmf-relay rtp-nte sip-notify
    codec g711ulaw
!
voice translation-rule 1
    rule 1 /^[1-7]...$/ /8517\0/
!
voice translation-profile SRST-4-Digit
    translate called 1
!
license udi pid C3900-SPE100/K9 sn FOC16120TZ9
hw-module pvdm 0/0
!
username admin password 7 0205554808095E731F
!
redundancy
!
controller T1 0/0/0
    cablelength short 110
    pri-group timeslots 1-24
    description PSTN PRI
!
ip ssh version 2
!
interface Port-channel3
    description EtherChannel link to RS206-A2960S
    ip address 10.5.12.12 255.255.255.0

```

```

ip pim sparse-mode
hold-queue 150 in
!
interface Embedded-Service-Engine0/0
no ip address
shutdown
!
interface GigabitEthernet0/0
no ip address
shutdown
duplex auto
speed auto
!
interface GigabitEthernet0/1
description RS206-A2960S Gig1/0/19
no ip address
duplex auto
speed auto
channel-group 3
!
interface GigabitEthernet0/2
description RS206-A2960S Gig2/0/19
no ip address
duplex auto
speed auto
channel-group 3
!
interface Serial0/0/0:23
no ip address
encapsulation hdlc
isdn switch-type primary-ni
isdn incoming-voice voice
no cdp enable
!
ip forward-protocol nd
!
ip pim autorp listener
no ip http server

```

```

ip http authentication aaa
ip http secure-server
!
ip route 0.0.0.0 0.0.0.0 10.5.12.1
!
nls resp-timeout 1
cpd cr-id 1
!
snmp-server community cisco RO
snmp-server community cisco123 RW
tacacs server TACACS-SERVER-1
address ipv4 10.4.48.15
key 7 00371605165E1F2D0A38
!
control-plane
!
voice-port 0/0/0:23
!
ccm-manager sccp local Port-channel3
!
mgcp profile default
!
sccp local Port-channel3
sccp ccm 10.4.48.114 identifier 4 priority 2 version 7.0
sccp ccm 10.4.48.113 identifier 3 priority 1 version 7.0
sccp ccm 10.4.48.112 identifier 2 priority 4 version 7.0
sccp ccm 10.4.48.111 identifier 1 priority 3 version 7.0
sccp
!
sccp ccm group 1
bind interface Port-channel3
associate ccm 3 priority 1
associate ccm 4 priority 2
associate ccm 1 priority 3
associate ccm 2 priority 4
associate profile 1 register CFB1RS206
switchback method graceful
switchback interval 60

```

```

!
dspfarm profile 1 conference
  description RS206 VG1 Conference Bridges
  codec ilbc
  codec g722-64
  codec g711ulaw
  codec g711alaw
  codec g729ar8
  codec g729abr8
  codec g729r8
  codec g729br8
  maximum sessions 5
  associate application SCCP
!
dial-peer voice 100 voip
  description SIP TRUNK to SUB1
  preference 3
  destination-pattern 317617....
  session protocol sipv2
  session target ipv4:10.4.48.111
  incoming called-number .
  voice-class codec 1
!
dial-peer voice 101 voip
  description SIP TRUNK to SUB2
  preference 4
  destination-pattern 317617....
  session protocol sipv2
  session target ipv4:10.4.48.112
  incoming called-number .
  voice-class codec 1
!
dial-peer voice 102 voip
  description SIP TRUNK to SUB3
  preference 1
  destination-pattern 317617....
  session protocol sipv2
  session target ipv4:10.4.48.113

```

```

  incoming called-number .
  voice-class codec 1
!
dial-peer voice 103 voip
  description SIP TRUNK to SUB4
  preference 2
  destination-pattern 317617....
  session protocol sipv2
  session target ipv4:10.4.48.114
  incoming called-number .
  voice-class codec 1
!
dial-peer voice 1911 pots
  destination-pattern 911
  port 0/0/0:23
  forward-digits 3
!
dial-peer voice 19911 pots
  destination-pattern 9911
  port 0/0/0:23
  forward-digits 3
!
dial-peer voice 17 pots
  destination-pattern 9[2-9].....
  port 0/0/0:23
  forward-digits 7
!
dial-peer voice 111 pots
  destination-pattern 91[2-9]..[2-9].....
  port 0/0/0:23
  forward-digits 11
!
dial-peer voice 19011 pots
  destination-pattern 9011T
  incoming called-number .
  direct-inward-dial
  port 0/0/0:23
  prefix 011

```

```

!
sip-ua
  registrar ipv4:10.4.48.110 expires 3600
!
gatekeeper
  shutdown
!
call-manager-fallback
  secondary-dialtone 9
  max-conferences 8 gain -6
  transfer-system full-consult
  ip source-address 10.5.12.12 port 2000
  max-ephones 50
  max-dn 35 dual-line
  dialplan-pattern 1 317617.... extension-length 8 extension-
pattern 8517....
  translation-profile incoming SRST-4-Digit
!
line con 0
  logging synchronous
line aux 0
line 2
  no activation-character
  no exec
  transport preferred none
  transport input all
  transport output pad telnet rlogin lapb-ta mop udptn v120 ssh
  stopbits 1
line vty 0 4
  transport preferred none
  transport input ssh
line vty 5 15
  transport preferred none
  transport input ssh
!
scheduler allocate 20000 1000
ntp update-calendar
ntp server 10.4.48.17
end

```

Remote Site Cisco ISR G2 2951 Standalone Voice Router with SCCP SRST

```

version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS203-2951-VG
!
boot-start-marker
boot-end-marker
!
card type t1 0 0
enable secret 4 /DtCCr53Q4B18jSImlUEqu7cNVZT0hxTZyUnZdsSrs
!
aaa new-model
!
aaa group server tacacs+ TACACS-SERVERS
  server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
aaa session-id common
!
clock timezone PST -8 0
clock summer-time PDT recurring
network-clock-participate wic 0
!
no ipv6 cef
ipv6 spd queue min-threshold 62
ipv6 spd queue max-threshold 63
ip source-route
ip cef
!
ip multicast-routing
!
ip domain name cisco.local

```

```

!
multilink bundle-name authenticated
!
isdn switch-type primary-ni
!
voice-card 0
    dspfarm
    dsp services dspfarm
!
voice service voip
    fax protocol t38 version 0 ls-redundancy 0 hs-redundancy 0
    fallback none
    sip
        bind control source-interface Port-channel20
        bind media source-interface Port-channel20
    !
    voice class codec 1
        codec preference 1 g711ulaw
        codec preference 2 g711alaw
        codec preference 3 g729r8
        codec preference 4 ilbc
    !
    voice translation-rule 1
        rule 1 /^[1-7]...$/ /8514\0/
    !
    voice translation-profile SRST-4-Digit
        translate called 1
    !
    license udi pid CISCO2921/K9 sn FTX1450AJ49
    hw-module pvdm 0/0
    !
    hw-module pvdm 0/1
    !
    username admin password 7 04585A150C2E1D1C5A
    !
    redundancy
    !
    controller T1 0/0/0
        cablelength short 110

```

```

    pri-group timeslots 1-24
    description PSTN PRI
!
controller T1 0/0/1
    cablelength long 0db
!
ip ssh version 2
!
interface Port-channel20
    description EtherChannel link to RS203-A3750X
    ip address 10.5.52.12 255.255.255.0
    ip pim sparse-mode
!
interface Embedded-Service-Engine0/0
    no ip address
    shutdown
!
interface GigabitEthernet0/0
    no ip address
    shutdown
    duplex auto
    speed auto
!
interface GigabitEthernet0/1
    description RS203-A3750X Gig1/0/20
    no ip address
    shutdown
    duplex auto
    speed auto
    channel-group 20
!
interface GigabitEthernet0/2
    description RS203-A3750X Gig2/0/20
    no ip address
    duplex auto
    speed auto
    channel-group 20
!
interface Serial0/0/0:23

```

```

no ip address
encapsulation hdlc
isdn switch-type primary-ni
isdn incoming-voice voice
no cdp enable
!
ip forward-protocol nd
!
ip pim autorp listener
no ip http server
ip http authentication aaa
ip http secure-server
!
ip route 0.0.0.0 0.0.0.0 10.5.52.1
!
snmp-server community cisco RO
snmp-server community cisco123 RW
tacacs server TACACS-SERVER-1
    address ipv4 10.4.48.15
    key 7 00371605165E1F2D0A38
!
control-plane
!
voice-port 0/0/0:23
!
ccm-manager sccp local Port-channel20
!
mgcp profile default
!
sccp local Port-channel20
sccp ccm 10.4.48.114 identifier 4 priority 4 version 7.0
sccp ccm 10.4.48.113 identifier 3 priority 3 version 7.0
sccp ccm 10.4.48.112 identifier 2 priority 2 version 7.0
sccp ccm 10.4.48.111 identifier 1 priority 1 version 7.0
sccp
!
sccp ccm group 1
    bind interface Port-channel20
    associate ccm 1 priority 1

```

```

associate ccm 2 priority 2
associate ccm 3 priority 3
associate ccm 4 priority 4
associate profile 1 register CFB1RS203
switchback method graceful
switchback interval 60
!
dspfarm profile 1 conference
    description RS203 Conference Bridges
    codec ilbc
    codec g722-64
    codec g711ulaw
    codec g711alaw
    codec g729ar8
    codec g729abr8
    codec g729r8
    codec g729br8
    maximum sessions 5
    associate application SCCP
!
dial-peer voice 100 voip
    description SIP TRUNK to SUB1
    preference 1
    destination-pattern 314614....
    session protocol sipv2
    session target ipv4:10.4.48.111
    incoming called-number .
    voice-class codec 1
!
dial-peer voice 101 voip
    description SIP TRUNK to SUB2
    preference 2
    destination-pattern 314614....
    session protocol sipv2
    session target ipv4:10.4.48.112
    incoming called-number .
    voice-class codec 1
!
dial-peer voice 102 voip

```

```

description SIP TRUNK to SUB3
preference 3
destination-pattern 314614....
session protocol sipv2
session target ipv4:10.4.48.113
incoming called-number .
voice-class codec 1
!
dial-peer voice 103 voip
description SIP TRUNK to SUB4
preference 4
destination-pattern 314614....
session protocol sipv2
session target ipv4:10.4.48.114
incoming called-number .
voice-class codec 1
!
dial-peer voice 1911 pots
destination-pattern 911
port 0/0/0:23
forward-digits 3
!
dial-peer voice 19911 pots
destination-pattern 9911
port 0/0/0:23
forward-digits 3
!
dial-peer voice 17 pots
destination-pattern 9[2-9].....
port 0/0/0:23
forward-digits 7
!
dial-peer voice 111 pots
destination-pattern 91[2-9]..[2-9].....
port 0/0/0:23
forward-digits 11
!
dial-peer voice 19011 pots
destination-pattern 9011T
incoming called-number .

```

```

direct-inward-dial
port 0/0/0:23
prefix 011
!
gatekeeper
shutdown
!
call-manager-fallback
secondary-dialtone 9
max-conferences 8 gain -6
transfer-system full-consult
ip source-address 10.5.52.12 port 2000
max-ephones 50
max-dn 35 dual-line
dialplan-pattern 1 314614.... extension-length 8 extension-
pattern 8514....
translation-profile incoming SRST-4-Digit
!
line con 0
logging synchronous
line aux 0
line 2
no activation-character
no exec
transport preferred none
transport input all
transport output pad telnet rlogin lapb-ta mop udptn v120 ssh
stopbits 1
line vty 0 4
transport preferred none
transport input ssh
line vty 5 15
transport preferred none
transport input ssh
!
scheduler allocate 20000 1000
ntp update-calendar
ntp server 10.4.48.17
end

```

Remote Site, Integrated Voice Router, Cisco ISR G2 2921, and Cisco ISR G2 2911

Cisco ISR G2 2921 is recommended as an integrated voice router for medium-sized remote-site offices with up to six T1/E1 PSTN interfaces at the location. For smaller sites with up to four T1/E1 PSTN interfaces, an integrated Cisco ISR G2 2911 provides a lower-cost alternative, with a line-for-line equivalent configuration.

The router configurations shown here include the configuration commands to enable Skinny Client Control Protocol (SCCP) SRST, and they use dynamic routing. The voice-specific commands are highlighted in each example. They also have a single T1 PRI interface with SIP dial peers connecting to four Cisco Unified CM subscribers.

Cisco ISR G2 2921 Integrated Voice Router with Multi-Link Etherchannel

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS210-2911
!
boot-start-marker
boot-end-marker
!
card type t1 0 0
enable secret 5 $1$JKAj$SZnj772b8Et.jyyyH0dxQ1
!
aaa new-model
!
aaa group server tacacs+ TACACS-SERVERS
server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
aaa session-id common
```

```
!
clock timezone PST -8 0
clock summer-time PDT recurring
network-clock-participate wic 0
!
no ipv6 cef
ipv6 spd queue min-threshold 62
ipv6 spd queue max-threshold 63
ip source-route
ip auth-proxy max-login-attempts 5
ip admission max-login-attempts 5
ip cef
!
ip multicast-routing
!
ip domain name cisco.local
!
multilink bundle-name authenticated
!
isdn switch-type primary-ni
!
voice-card 0
dspfarm
dsp services dspfarm
!
voice service voip
fax protocol t38 version 0 ls-redundancy 0 hs-redundancy 0
fallback none
sip
bind control source-interface Loopback0
bind media source-interface Loopback0
!
voice class codec 1
codec preference 1 g711ulaw
codec preference 2 g711alaw
codec preference 3 g729r8
codec preference 4 ilbc
```

```

!
voice translation-rule 1
 rule 1 /^[1-7]...$/ /8521\0/
!
voice translation-profile SRST-4-Digit
 translate called 1
!
license udi pid CISCO2921/K9 sn FTX1419ALZ6
hw-module pvdm 0/0
!
username admin password 7 104D580A061843595F
!
redundancy
!
controller T1 0/0/0
 cablelength short 110
 pri-group timeslots 1-24
 description PSTN PRI
!
ip ssh source-interface Loopback0
ip ssh version 2
!
class-map match-any DATA
 match dscp af21
class-map match-any INTERACTIVE-VIDEO
 match dscp cs4 af41
class-map match-any CRITICAL-DATA
 match dscp cs3 af31
class-map match-any VOICE
 match dscp ef
class-map match-any SCAVENGER
 match dscp cs1 af11
class-map match-any NETWORK-CRITICAL
 match dscp cs2 cs6
!
policy-map WAN
 class VOICE

```

```

 priority percent 10
class INTERACTIVE-VIDEO
 priority percent 23
class CRITICAL-DATA
 bandwidth percent 15
 random-detect dscp-based
class DATA
 bandwidth percent 19
 random-detect dscp-based
class SCAVENGER
 bandwidth percent 5
class NETWORK-CRITICAL
 bandwidth percent 3
class class-default
 bandwidth percent 25
 random-detect
policy-map WAN-INTERFACE-G0/0
 class class-default
 shape average 10000000
 service-policy WAN
!
interface Loopback0
 ip address 10.255.255.210 255.255.255.255
 ip pim sparse-mode
!
interface Port-channel1
 description RS210-A3750X
 no ip address
 hold-queue 150 in
!
interface Port-channel1.64
 description Wired Data
 encapsulation dot1Q 64
 ip address 10.5.148.1 255.255.255.0
 ip helper-address 10.4.48.10
 ip pim sparse-mode
!

```

```

interface Port-channel1.65
  description Wireless Data
  encapsulation dot1Q 65
  ip address 10.5.146.1 255.255.255.0
  ip helper-address 10.4.48.10
  ip pim sparse-mode
!
interface Port-channel1.69
  description Wired Voice
  encapsulation dot1Q 69
  ip address 10.5.149.1 255.255.255.0
  ip helper-address 10.4.48.10
  ip pim sparse-mode
!
interface Port-channel1.70
  description Wireless Voice
  encapsulation dot1Q 70
  ip address 10.5.147.1 255.255.255.0
  ip helper-address 10.4.48.10
  ip pim sparse-mode
!
interface GigabitEthernet0/0
  bandwidth 10000
  no ip address
  duplex auto
  speed auto
  no cdp enable
  service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/0.38
  encapsulation dot1Q 38
  ip address 10.4.38.210 255.255.255.0
  ip pim sparse-mode
  ip summary-address eigrp 300 10.5.144.0 255.255.248.0
!
interface GigabitEthernet0/1
  description RS210-A3750X Gig1/0/24

```

```

  no ip address
  duplex auto
  speed auto
  channel-group 1
!
interface GigabitEthernet0/2
  description RS210-A3750X Gig2/0/24
  no ip address
  duplex auto
  speed auto
  channel-group 1
!
interface Serial0/0/0:23
  no ip address
  encapsulation hdlc
  isdn switch-type primary-ni
  isdn incoming-voice voice
  no cdp enable
!
router eigrp 300
  network 10.4.38.0 0.0.0.255
  network 10.5.0.0 0.0.255.255
  network 10.255.0.0 0.0.255.255
  passive-interface default
  no passive-interface GigabitEthernet0/0.38
  eigrp router-id 10.255.255.210
  eigrp stub connected summary
!
ip forward-protocol nd
!
ip pim autorp listener
ip pim register-source Loopback0
no ip http server
ip http authentication aaa
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!

```

```

ip tacacs source-interface Loopback0
!
logging 10.4.48.35
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
tacacs server TACACS-SERVER-1
    address ipv4 10.4.48.15
    key 7 097F4B0A0B0003390E15
!
control-plane
!
voice-port 0/0/0:23
!
ccm-manager sccp local Loopback0
!
mgcp profile default
!
sccp local Loopback0
sccp ccm 10.4.48.114 identifier 4 priority 4 version 7.0
sccp ccm 10.4.48.113 identifier 3 priority 3 version 7.0
sccp ccm 10.4.48.112 identifier 2 priority 2 version 7.0
sccp ccm 10.4.48.111 identifier 1 priority 1 version 7.0
sccp
!
sccp ccm group 1
    bind interface Loopback0
    associate ccm 1 priority 1
    associate ccm 2 priority 2
    associate ccm 3 priority 3
    associate ccm 4 priority 4
    associate profile 1 register CFB1RS210
    switchback method graceful
    switchback interval 60
!
dspfarm profile 1 conference

```

```

description RS210 Conference Bridge
codec ilbc
codec g722-64
codec g711ulaw
codec g711alaw
codec g729ar8
codec g729abr8
codec g729r8
codec g729br8
maximum sessions 5
associate application SCCP
!
dial-peer voice 1911 pots
    destination-pattern 911
    port 0/0/0:23
    forward-digits 3
!
dial-peer voice 19911 pots
    destination-pattern 9911
    port 0/0/0:23
    forward-digits 3
!
dial-peer voice 17 pots
    destination-pattern 9[2-9].....
    port 0/0/0:23
    forward-digits 7
!
dial-peer voice 111 pots
    destination-pattern 91[2-9]..[2-9].....
    port 0/0/0:23
    forward-digits 11
!
dial-peer voice 19011 pots
    destination-pattern 9011T
    incoming called-number .
    direct-inward-dial
    port 0/0/0:23

```

```

prefix 011
!
dial-peer voice 100 voip
description SIP TRUNK to SUB1
preference 1
destination-pattern 321621....
session protocol sipv2
session target ipv4:10.4.48.111
incoming called-number .
voice-class codec 1
!
dial-peer voice 101 voip
description SIP TRUNK to SUB2
preference 2
destination-pattern 321621....
session protocol sipv2
session target ipv4:10.4.48.112
incoming called-number .
voice-class codec 1
!
dial-peer voice 102 voip
description SIP TRUNK to SUB3
preference 3
destination-pattern 321621....
session protocol sipv2
session target ipv4:10.4.48.113
incoming called-number .
voice-class codec 1
!
dial-peer voice 103 voip
description SIP TRUNK to SUB4
preference 4
destination-pattern 321621....
session protocol sipv2
session target ipv4:10.4.48.114
incoming called-number .
voice-class codec 1

```

```

!
gatekeeper
shutdown
!
call-manager-fallback
secondary-dialtone 9
max-conferences 8 gain -6
transfer-system full-consult
ip source-address 10.255.255.210 port 2000
max-ephones 50
max-dn 35 dual-line
dialplan-pattern 1 321621.... extension-length 8 extension-
pattern 8521....
translation-profile incoming SRST-4-Digit
!
line con 0
logging synchronous
line aux 0
line vty 0 4
transport preferred none
transport input ssh
line vty 5 15
transport preferred none
transport input ssh
!
scheduler allocate 20000 1000
ntp source Loopback0
ntp server 10.4.48.17
!
end

```

Cisco ISR G2 2921 Integrated Voice Router with a Single Ethernet

```
version 15.1
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname RS211-2921-1
!
boot-start-marker
boot-end-marker
!
card type t1 0 0
enable secret 4 /DtCCr53Q4B18jSIm1UEqu7cNVZTOhxTZyUnZdsSrsrw
!
aaa new-model
!
aaa group server tacacs+ TACACS-SERVERS
    server name TACACS-SERVER-1
!
aaa authentication login default group TACACS-SERVERS local
aaa authorization console
aaa authorization exec default group TACACS-SERVERS local
!
aaa session-id common
!
clock timezone PST -8 0
clock summer-time PDT recurring
network-clock-participate wic 0
!
no ipv6 cef
ip source-route
ip cef
!
ip multicast-routing
!
ip domain name cisco.local
```

```
!
multilink bundle-name authenticated
!
isdn switch-type primary-ni
!
voice-card 0
    dspfarm
    dsp services dspfarm
!
voice service voip
    fax protocol t38 version 0 ls-redundancy 0 hs-redundancy 0
    fallback none
    sip
        bind control source-interface Loopback0
        bind media source-interface Loopback0
!
voice class codec 1
    codec preference 1 g711ulaw
    codec preference 2 g711alaw
    codec preference 3 g729r8
    codec preference 4 ilbc
!
voice translation-rule 1
    rule 1 /^[1-7]...$/ /8522\0/
!
voice translation-profile SRST-4-Digit
    translate called 1
!
license udi pid CISC02911/K9 sn FTX1418AM08
hw-module pvdm 0/0
!
username admin password 7 121A540411045D5679
!
redundancy
!
controller T1 0/0/0
    cablelength short 110
```

```

pri-group timeslots 1-24
description PSTN PRI 1
!
controller T1 0/0/1
cablelength short 110
pri-group timeslots 1-24
description PSTN PRI 2
!
ip ssh source-interface Loopback0
ip ssh version 2
!
track 50 ip sla 100 reachability
!
class-map match-any DATA
  match dscp af21
class-map match-any BGP-ROUTING
  match protocol bgp
class-map match-any INTERACTIVE-VIDEO
  match dscp cs4 af41
class-map match-any CRITICAL-DATA
  match dscp cs3 af31
class-map match-any VOICE
  match dscp ef
class-map match-any SCAVENGER
  match dscp cs1 af11
class-map match-any NETWORK-CRITICAL
  match dscp cs2 cs6
!
policy-map MARK-BGP
  class BGP-ROUTING
    set dscp cs6
policy-map WAN
  class VOICE
    priority percent 10
  class INTERACTIVE-VIDEO
    priority percent 23
  class CRITICAL-DATA

```

```

  bandwidth percent 15
  random-detect dscp-based
class DATA
  bandwidth percent 19
  random-detect dscp-based
class SCAVENGER
  bandwidth percent 5
class NETWORK-CRITICAL
  bandwidth percent 3
  service-policy MARK-BGP
class class-default
  bandwidth percent 25
  random-detect
policy-map WAN-INTERFACE-G0/0
  class class-default
    shape average 10000000
    service-policy WAN
!
interface Loopback0
  ip address 10.255.255.211 255.255.255.255
  ip pim sparse-mode
!
interface GigabitEthernet0/0
  bandwidth 20000
  no ip address
  duplex auto
  speed auto
  no cdp enable
  service-policy output WAN-INTERFACE-G0/0
!
interface GigabitEthernet0/0.38
  encapsulation dot1Q 38
  ip address 10.4.38.211 255.255.255.0
  ip pim sparse-mode
  ip summary-address eigrp 300 10.5.152.0 255.255.248.0
!
interface GigabitEthernet0/1

```

```

no ip address
shutdown
duplex auto
speed auto
!
interface GigabitEthernet0/2
description RS211-A2960S Gig1/0/24
no ip address
duplex auto
speed auto
!
interface GigabitEthernet0/2.64
description Wired Data
encapsulation dot1Q 64
ip address 10.5.156.2 255.255.255.0
ip helper-address 10.4.48.10
ip pim dr-priority 110
ip pim sparse-mode
standby version 2
standby 1 ip 10.5.156.1
standby 1 priority 110
standby 1 preempt
standby 1 authentication md5 key-string 7 0007421507545A545C
standby 1 track 50 decrement 10
!
interface GigabitEthernet0/2.65
description Wireless Data
encapsulation dot1Q 65
ip address 10.5.154.2 255.255.255.0
ip helper-address 10.4.48.10
ip pim dr-priority 110
ip pim sparse-mode
standby version 2
standby 1 ip 10.5.154.1
standby 1 priority 110
standby 1 preempt
standby 1 authentication md5 key-string 7 00071A1507545A545C

```

```

standby 1 track 50 decrement 10
!
interface GigabitEthernet0/2.69
encapsulation dot1Q 69
ip address 10.5.157.2 255.255.255.0
ip helper-address 10.4.48.10
ip pim dr-priority 110
ip pim sparse-mode
standby version 2
standby 1 ip 10.5.157.1
standby 1 priority 110
standby 1 preempt
standby 1 authentication md5 key-string 7 04585A150C2E1D1C5A
standby 1 track 50 decrement 10
!
interface GigabitEthernet0/2.70
description Wireless Voice
encapsulation dot1Q 70
ip address 10.5.155.2 255.255.255.0
ip helper-address 10.4.48.10
ip pim dr-priority 110
ip pim sparse-mode
standby version 2
standby 1 ip 10.5.155.1
standby 1 priority 110
standby 1 preempt
standby 1 authentication md5 key-string 7 121A0C0411045D5679
standby 1 track 50 decrement 10
!
interface GigabitEthernet0/2.99
description Transit Net
encapsulation dot1Q 99
ip address 10.5.152.1 255.255.255.252
ip pim sparse-mode
!
interface Serial0/0/0:23
no ip address

```

```

encapsulation hdlc
isdn switch-type primary-ni
isdn incoming-voice voice
no cdp enable
!
router eigrp 300
 network 10.4.38.0 0.0.0.255
 network 10.5.0.0 0.0.255.255
 network 10.255.0.0 0.0.255.255
 redistribute eigrp 100 route-map LOOPBACK-ONLY
 passive-interface default
 no passive-interface GigabitEthernet0/0.38
 eigrp router-id 10.255.255.211
 eigrp stub connected summary redistributed
!
router eigrp 100
 network 10.4.0.0 0.1.255.255
 network 10.255.0.0 0.0.255.255
 redistribute eigrp 300
 passive-interface default
 no passive-interface GigabitEthernet0/2.99
 eigrp router-id 10.255.255.211
!
ip forward-protocol nd
!
ip pim autorp listener
ip pim register-source Loopback0
no ip http server
ip http authentication aaa
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!
ip tacacs source-interface Loopback0
!
ip access-list standard R2-LOOPBACK
 permit 10.255.253.211
 logging 10.4.48.35

```

```

!
route-map LOOPBACK-ONLY permit 10
 match ip address R2-LOOPBACK
!
snmp-server community cisco RO
snmp-server community cisco123 RW
snmp-server trap-source Loopback0
tacacs server TACACS-SERVER-1
 address ipv4 10.4.48.15
 key 7 122A0014000E182F2F32
!
control-plane
!
voice-port 0/0/0:23
!
ccm-manager sccp local Loopback0
!
mgcp profile default
!
sccp local Loopback0
sccp ccm 10.4.48.114 identifier 4 priority 4 version 7.0
sccp ccm 10.4.48.113 identifier 3 priority 3 version 7.0
sccp ccm 10.4.48.112 identifier 2 priority 2 version 7.0
sccp ccm 10.4.48.111 identifier 1 priority 1 version 7.0
sccp
!
sccp ccm group 1
 bind interface Loopback0
 associate ccm 1 priority 1
 associate ccm 2 priority 2
 associate ccm 3 priority 3
 associate ccm 4 priority 4
 associate profile 1 register CFB1RS211
 switchback method graceful
 switchback interval 60
!
dspfarm profile 1 conference

```

```

description RS211 VG1 Conference Bridge
codec ilbc
codec g722-64
codec g711ulaw
codec g711alaw
codec g729ar8
codec g729abr8
codec g729r8
codec g729br8
maximum sessions 5
associate application SCCP
!
dial-peer voice 100 voip
description SIP TRUNK to SUB1
preference 1
destination-pattern 322622....
session protocol sipv2
session target ipv4:10.4.48.111
incoming called-number .
voice-class codec 1
!
dial-peer voice 101 voip
description SIP TRUNK to SUB2
preference 2
destination-pattern 322622....
session protocol sipv2
session target ipv4:10.4.48.112
incoming called-number .
voice-class codec 1
!
dial-peer voice 102 voip
description SIP TRUNK to SUB3
preference 3
destination-pattern 322622....
session protocol sipv2
session target ipv4:10.4.48.113
incoming called-number .

```

```

voice-class codec 1
!
dial-peer voice 103 voip
description SIP TRUNK to SUB4
preference 4
destination-pattern 322622....
session protocol sipv2
session target ipv4:10.4.48.114
incoming called-number .
voice-class codec 1
!
dial-peer voice 1911 pots
destination-pattern 911
port 0/0/0:23
forward-digits 3
!
dial-peer voice 19911 pots
destination-pattern 9911
port 0/0/0:23
forward-digits 3
!
dial-peer voice 17 pots
destination-pattern 9[2-9].....
port 0/0/0:23
forward-digits 7
!
dial-peer voice 111 pots
destination-pattern 91[2-9]..[2-9].....
port 0/0/0:23
forward-digits 11
!
dial-peer voice 19011 pots
destination-pattern 9011T
incoming called-number .
direct-inward-dial
port 0/0/0:23
prefix 011

```

```
!  
gatekeeper  
  shutdown  
!  
call-manager-fallback  
  secondary-dialtone 9  
  max-conferences 8 gain -6  
  transfer-system full-consult  
  ip source-address 10.255.255.211 port 2000  
  max-ephones 50  
  max-dn 35 dual-line  
  dialplan-pattern 1 322622.... extension-length 8 extension-  
pattern 8522....  
  translation-profile incoming SRST-4-Digit  
!  
line con 0  
  logging synchronous  
line aux 0  
line vty 0 4  
  transport preferred none  
  transport input ssh  
line vty 5 15  
  transport preferred none  
  transport input ssh  
!  
scheduler allocate 20000 1000  
ntp source Loopback0  
ntp server 10.4.48.17  
end
```

Notes

Appendix A: Product List

Data Center or Server Room

Functional Area	Product Description	Part Numbers	Software
Call Control	Cisco Media Convergence Server 7845-I3 for Unified Communications Manager up to 10,000 users	MCS7845I3-K9-CMD3A	8.6(2a)SU1
	Cisco Media Convergence Server 7835-I3 for Unified Communications Manager up to 2500 users	MCS7835I3-K9-CMD3A	
Voice Messaging	Cisco Media Convergence Server 7845-I3 for Unity Connection up to 10,000 users	MCS7845I3-K9-UCC2	8.6(2a)SU1
	Cisco Media Convergence Server 7835-I3 for Unity Connection up to 2500 users	MCS7835I3-K9-UCC2	
Call Control Virtual Servers	Cisco UCS C210 M2 General-Purpose Rack-Mount Server for unified communications applications	UCS-C210M2-VCD2	8.6(2a)SU1 ESXi4.1
	Cisco UCS C200 M2 High-Density Rack-Mount Server for unified communications applications	UCS-C200M2-VCD2	
	Unified CMBE6K UCS C200M2 for Unified Communications Manager up to 500 users	UCS-C200M2-BE6K	

Headquarters Voice

Functional Area	Product Description	Part Numbers	Software
Headquarters Voice Router	Cisco 3945 Voice Sec. Bundle, PVDM3-64, UC and SEC License PAK	C3945-VSEC/K9	15.1(4)M4 securityk9 datak9 uck9
	Cisco 3925 Voice Sec. Bundle, PVDM3-64, UC and SEC License PAK	C3925-VSEC/K9	
	Security Paper PAK for Cisco 3900 Series	SL-39-SEC-K9	
	Data Paper PAK for Cisco 3900 series	SL-39-DATA-K9	
	Unified Communications Paper PAK for Cisco 3900 Series	SL-39-UC-K9	
	2 Port Channelized T1/E1 and ISDN PRI High Speed WAN Interface Card	HWIC-2CE1T1-PRI	
	2-Port 2nd Gen Multiflex Trunk Voice/WAN Int. Card-T1/E1	VWIC2-2MFT-T1/E1	

Remote Site Voice

Functional Area	Product Description	Part Numbers	Software
Remote Site Voice Routers	Cisco 2951 Voice Sec. Bundle, PVDM3-32, UC and SEC License PAK	C2951-VSEC/K9	15.1(4)M4 securityk9 datak9 uck9
	Cisco 2921 Voice Sec. Bundle, PVDM3-32, UC and SEC License PAK	C2921-VSEC/K9	
	Cisco 2911 Voice Sec. Bundle, PVDM3-32, UC and SEC License PAK	C2911-VSEC/K9	
	Security Paper PAK for Cisco 2900 Series	SL-29-SEC-K9	
	Data Paper PAK for Cisco 2900 series	SL-29-DATA-K9	
	Unified Communications Paper PAK for Cisco 2900 Series	SL-29-UC-K9	
	2 Port Channelized T1/E1 and ISDN PRI High Speed WAN Interface Card	HWIC-2CE1T1-PRI	
	2-Port 2nd Gen Multiflex Trunk Voice/WAN Int. Card-T1/E1	VWIC2-2MFT-T1/E1	
Remote Site Voice Routers	Cisco 881 SRST Ethernet Security Router with FXS FXO 802.11n FCC	C881SRST-K9	15.1(4)M2 voice

Endpoints

Functional Area	Product Description	Part Numbers	Software
Phones	Unified IP Phone with six lines, video, color, Wi-Fi, Bluetooth, USB	CP-9971	—
	Unified IP Phone with four lines, video, color	CP-8945	—
	Unified IP Conference Phone	CP-7937G	—
	Unified IP Wireless Phone with six lines, color, Bluetooth	CP-7926G	—
	Unified IP Phone with twelve lines	CP-6961	—
	Unified IP Phone with four lines	CP-6945	—
	Unified IP Phone with two lines	CP-6921	—
	Unified IP Phone with one line	CP-6901	—
	IP Communicator for Windows PC with eight lines	IPCOMM86-SW	—

Data Center Core

Functional Area	Product Description	Part Numbers	Software
Core Switch	Cisco Nexus 5596 up to 96-port 10GbE, FCoE, and Fibre Channel SFP+	N5K-C5596UP-FA	NX-OS 5.1(3)N1(1a) Layer 3 License
	Cisco Nexus 5596 Layer 3 Switching Module	N55-M160L30V2	
	Cisco Nexus 5548 up to 48-port 10GbE, FCoE, and Fibre Channel SFP+	N5K-C5548UP-FA	
	Cisco Nexus 5548 Layer 3 Switching Module	N55-D160L3	
Ethernet Extension	Cisco Nexus 2000 Series 48 Ethernet 100/1000BASE-T Fabric Extender	N2K-C2248TP-1GE	—
	Cisco Nexus 2000 Series 48 Ethernet 100/1000BASE-T (enhanced) Fabric Extender	N2K-C2248TP-E	
	Cisco Nexus 2000 Series 32 1/10 GbE SFP+, FCoE capable Fabric Extender	N2K-C2232PP-10GE	

Server Room

Functional Area	Product Description	Part Numbers	Software
Stackable Ethernet Switch	Cisco Catalyst 3750-X Series Stackable 48 Ethernet 10/100/1000 ports	WS-C3750X-48T-S	15.0(1)SE2 IP Base
	Cisco Catalyst 3750-X Series Stackable 24 Ethernet 10/100/1000 ports	WS-C3750X-24T-S	
	Cisco Catalyst 3750-X Series Four GbE SFP ports network module	C3KX-NM-1G	
Standalone Ethernet Switch	Cisco Catalyst 3560-X Series Standalone 48 Ethernet 10/100/1000 ports	WS-C3560X-48T-S	15.0(1)SE2 IP Base
	Cisco Catalyst 3560-X Series Standalone 24 Ethernet 10/100/1000 ports	WS-C3560X-24T-S	
	Cisco Catalyst 3750-X Series Four GbE SFP ports network module	C3KX-NM-1G	

LAN Access Layer

Functional Area	Product Description	Part Numbers	Software
Modular Access Layer Switch	Cisco Catalyst 4507R+E 7-slot Chassis with 48Gbps per slot	WS-C4507R+E	3.3.0.SG(15.1-1SG) IP Base
	Cisco Catalyst 4500 E-Series Supervisor Engine 7L-E	WS-X45-SUP7L-E	
	Cisco Catalyst 4500 E-Series 48 Ethernet 10/100/1000 (RJ45) PoE+ ports	WS-X4648-RJ45V+E	
	Cisco Catalyst 4500 E-Series 48 Ethernet 10/100/1000 (RJ45) PoE+,UPoE ports	WS-X4748-UPOE+E	
Stackable Access Layer Switch	Cisco Catalyst 3750-X Series Stackable 48 Ethernet 10/100/1000 PoE+ ports	WS-C3750X-48PF-S	15.0(1)SE2 IP Base
	Cisco Catalyst 3750-X Series Stackable 24 Ethernet 10/100/1000 PoE+ ports	WS-C3750X-24P-S	
	Cisco Catalyst 3750-X Series Two 10GbE SFP+ and Two GbE SFP ports network module	C3KX-NM-10G	
	Cisco Catalyst 3750-X Series Four GbE SFP ports network module	C3KX-NM-1G	
Standalone Access Layer Switch	Cisco Catalyst 3560-X Series Standalone 48 Ethernet 10/100/1000 PoE+ ports	WS-C3560X-48PF-S	15.0(1)SE2 IP Base
	Cisco Catalyst 3560-X Series Standalone 24 Ethernet 10/100/1000 PoE+ ports	WS-C3560X-24P-S	
	Cisco Catalyst 3750-X Series Two 10GbE SFP+ and Two GbE SFP ports network module	C3KX-NM-10G	
	Cisco Catalyst 3750-X Series Four GbE SFP ports network module	C3KX-NM-1G	
Stackable Access Layer Switch	Cisco Catalyst 2960-S Series 48 Ethernet 10/100/1000 PoE+ ports and Two 10GbE SFP+ Uplink ports	WS-C2960S-48FPD-L	15.0(1)SE2 LAN Base
	Cisco Catalyst 2960-S Series 48 Ethernet 10/100/1000 PoE+ ports and Four GbE SFP Uplink ports	WS-C2960S-48FPS-L	
	Cisco Catalyst 2960-S Series 24 Ethernet 10/100/1000 PoE+ ports and Two 10GbE SFP+ Uplink ports	WS-C2960S-24PD-L	
	Cisco Catalyst 2960-S Series 24 Ethernet 10/100/1000 PoE+ ports and Four GbE SFP Uplink ports	WS-C2960S-24PS-L	
	Cisco Catalyst 2960-S Series Flexstack Stack Module	C2960S-STACK	

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