



Systems Test Architecture Reference Manual for IPCC Enterprise

IP Communications Systems Test Release 3.0

Corporate Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
<http://www.cisco.com>
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

Text Part Number: OL-6866-02



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Preface

Purpose

This manual provides a description of the components and configurations that have been tested and verified as part of IP Communications Systems Test Release 3.0 for IPCC Enterprise.

This manual also includes related information for selected call flows, troubleshooting, tips, call failures, and failover behavior.

Audience

This manual is intended for system administrators who are familiar with the various hardware and software components included in IP Communications Systems Test Release 3.0. It assumes that readers have the technical and product knowledge to install, configure, manage, and troubleshoot the systems described.

Organization

The manual is divided into the following chapters:

| Chapter | Description |
|--|--|
| Chapter 1, “Test Case Study” | Contains the sample business logic used to create the business requirements to reflect real-world contact centers. |
| Chapter 2, “Test Scenarios and Site Models” | Contains the IP Communications Systems IPCC Enterprise test site scenarios and site models, including topology maps, that were developed from the sample business case study. |
| Chapter 3, “Components Configuration” | Provides information on configuring IPCC Enterprise components, including as appropriate: version numbers, related hardware, and related documentation. |
| Chapter 4, “Tested Call Flows” | Provides specifics for three sample call flows including post-routed and outbound calls. |
| Chapter 5, “Troubleshooting and Technical Tips” | Provides troubleshooting information specific to the installation and configuration of the test scenarios, as well as tips on items to be aware of and ways to avoid problems. |
| Chapter 6, “Failure, Failover, and Recovery” | Describes the observed failure and failover behavior within the test environment. |
| Appendix A, “Release Versions of Components” | Shows the release versions of the components used in the IPCC Enterprise test environment. |
| Appendix B, “Infrastructure Components Configuration Commands” | Contains the configuration commands for general infrastructure IPCC Enterprise components deployed at the various sites. |
| Appendix C, “Call Flow Components Configuration Commands” | Contains the configuration commands for the specific components involved in handling the three different call flows at the various sites. |

Related Documentation

Systems Release Notes for IPCC Enterprise: IP Communications Systems Test Release 3.0—Provides late-breaking information, including resolved and known caveats, and important notes. This document is available at the following URL: http://www.cisco.com/univercd/cc/td/doc/product/voice/ip_tele/gblink/system/gbtst3x/3_0/index.htm

Conventions

This manual uses the following conventions:

| Format | Example |
|--|---|
| Boldface type is used for user entries, keys, buttons, and folder and submenu names. | Choose Edit > Find from the ICM Configure menu bar. |
| Italic type indicates one of the following: <ul style="list-style-type: none"> • A newly introduced term • For emphasis • A generic syntax item that you must replace with a specific value • A title of a publication | <ul style="list-style-type: none"> • A <i>skill group</i> is a collection of agents who share similar skills. • <i>Do not</i> use the numerical naming convention that is used in the predefined templates (for example, persvc01). • IF (<i>condition, true-value, false-value</i>) • For more information, see the <i>Cisco ICM Software Database Schema Handbook</i>. |
| An arrow (>) indicates an item from a pull-down menu. | The Save command from the File menu is referenced as File > Save . |

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San Jose, CA 95134-9883

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Cisco Technical Support Website

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<http://www.cisco.com/techsupport>

Access to all tools on the Cisco Technical Support Website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

<http://tools.cisco.com/RPF/register/register.do>

**Note**

Use the Cisco Product Identification (CPI) tool to locate your product serial number before submitting a web or phone request for service. You can access the CPI tool from the Cisco Technical Support Website by clicking the **Tools & Resources** link under Documentation & Tools. Choose **Cisco Product Identification Tool** from the Alphabetical Index drop-down list, or click the **Cisco Product Identification Tool** link under Alerts & RMAs. The CPI tool offers three search options: by product ID or model name; by tree view; or for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco TAC engineer. The TAC Service Request Tool is located at this URL:

<http://www.cisco.com/techsupport/servicerequest>

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco TAC engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)

EMEA: +32 2 704 55 55

USA: 1 800 553-2447

For a complete list of Cisco TAC contacts, go to this URL:

<http://www.cisco.com/techsupport/contacts>

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—Your network is “down,” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- Cisco Marketplace provides a variety of Cisco books, reference guides, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:
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- The Cisco *Product Catalog* describes the networking products offered by Cisco Systems, as well as ordering and customer support services. Access the Cisco Product Catalog at this URL:
<http://cisco.com/univercd/cc/td/doc/pcat/>
- *Cisco Press* publishes a wide range of general networking, training and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:
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- *Packet* magazine is the Cisco Systems technical user magazine for maximizing Internet and networking investments. Each quarter, Packet delivers coverage of the latest industry trends, technology breakthroughs, and Cisco products and solutions, as well as network deployment and troubleshooting tips, configuration examples, customer case studies, certification and training information, and links to scores of in-depth online resources. You can access Packet magazine at this URL:

<http://www.cisco.com/packet>

- *iQ Magazine* is the quarterly publication from Cisco Systems designed to help growing companies learn how they can use technology to increase revenue, streamline their business, and expand services. The publication identifies the challenges facing these companies and the technologies to help solve them, using real-world case studies and business strategies to help readers make sound technology investment decisions. You can access iQ Magazine at this URL:

<http://www.cisco.com/go/iqmagazine>

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:

<http://www.cisco.com/ipj>

- World-class networking training is available from Cisco. You can view current offerings at this URL:

<http://www.cisco.com/en/US/learning/index.html>



Test Case Study

This chapter provides a brief overview of the Cisco IP Communications Systems and the sample business case study developed to reflect real-world contact center deployments.

This chapter contains the following sections:

- [Introduction, page 1-1](#)
- [Testing Objectives, page 1-3](#)
- [Sample Business Case, page 1-4](#)

Introduction

Cisco Internet Protocol (IP) Communications solutions deliver fully integrated communications by enabling data, voice, and video to be transmitted over a single, unified IP network infrastructure. Cisco IP Communications solutions are designed to optimize feature functionality, reduce configuration and maintenance requirements, and provide interoperability with a wide variety of other applications. Cisco IP Communications solutions provide this capability while maintaining a high level of availability, quality of service (QoS), and security for the enterprise network.

Cisco IP Communications encompasses the following solutions:

- IP Telephony (IPT)
- IP Contact Center (IPCC)
- IP Voice Applications

- IP Videoconferencing (IP/VC)
- IP Video Telephony

In this manual, we discuss the testing and verification of only the IPCC components of the Cisco IP Communications Systems Test Release 3.0.

Overview of IPCC Solutions

IPCC is an integral part of Cisco Architecture for Voice, Video and Integrated Data (AVVID). It delivers intelligent contact routing, call treatment, network-to-desktop computer telephony integration (CTI), and multi-channel contact management over an IP infrastructure to contact center agents anywhere in the enterprise.

The Cisco IP network infrastructure also permits rapid deployment of emerging applications such as desktop IP Telephony, unified messaging, video telephony, desktop collaboration, and enterprise application integration with IP phone displays.

By combining multi-channel automatic call distributor (ACD) functionality with IP Telephony in a unified solution, Cisco IPCC helps to rapidly deploy a distributed contact center infrastructure.

The IPCC software profiles each customer using contact-related data such as dialed number and caller-entered digits (CED) and, simultaneously, monitors the resources at contact center to meet customer needs, including agent skills and availability, queue lengths, expected delay and so on.

This combination of customer and contact center data is processed through user-defined routing scripts that graphically reflect a company's business rules, thus enabling Cisco IPCC to route each contact to the optimum resource anywhere in the enterprise.

Cisco IPCC software enables companies to deploy a complete network-to-desktop CTI strategy, including comprehensive capability at the agent's workstation. Cisco IPCC Enterprise solutions deliver a uniquely rich set of data to business applications, providing enterprise-wide call-event and customer-profile information to a targeted agent's desktop.

Testing Objectives

The intent of conducting systems testing is to define and validate the seamless interoperability and stability of components that comprise a complete and optimized IP Communications System.

Cisco has done this by designing, installing, configuring, and testing IPCC hardware and software that work together in a predictable, effective, and reliable manner.

Cisco has created a sample business case of a financial firm with distributed contact centers. For the financial firm, Cisco has defined real-world business requirements that exercise specific features and functions of the IPCC solution. It has then proceeded to use this business case to design and configure a test environment that reflects the sample business environment. Various contact centers or sites have been designed and installed with IPCC components to enable testing and verification of the IPCC solution.

The testing done at the various sites focuses in varying degrees on performance and behavior issues such as:

- End-to-end functionality
- Interoperability
- Reliability
- Redundancy
- Stability
- Upgradeability
- Stress
- Load
- Usability
- Installability
- Serviceability

Sample Business Case

The following sample business case and related customer requirements were defined to design IPCC call flows, and the software and hardware topologies that would support these call flows. From these requirements, the complex scripting and configuration scenarios and site models were developed for testing. Test scenarios and site models are described in detail in [Chapter 2, “Test Scenarios and Site Models”](#).

This chapter discusses the basic customer business requirements, agent profiles at the various contact centers or sites, and sample call flows designed to address specific business functions. [Chapter 4, “Tested Call Flows”](#) discusses the specifics of testing three types of call flows and the configuration tasks required to set up the sample call flows.

Customer Business Requirements

This section describes the business profile and requirements of the sample business, Global Siren Financial (GSF), a global multi-billion dollar financial services firm. GSF offers the following services to its customers:

- Brokerage services
- Securities sales
- Internet banking
- Account and collection services

Contact Centers or Sites

GSF depends on its contact centers to be the primary interface to its customers and brokers who resell their securities in the United States. The brokers need to have a reliable, cost effective, and efficient way to manage their customer contacts across the seven contact center sites.

The contact center names or site names have been mapped to specific site numbers for ease of use. For purposes of this manual, from Chapter 2 onwards, we will refer to the sites by their unique site numbers. For instance, the contact center at Nickerson will be referred to as Site1 and the contact center at Newark as Site4.

Table 1-1 lists the site name, the site number, the number of agents, and number of agents per Cisco CallManager cluster at each of the seven sites.

Table 1-1 Number of Agents at Sites

| Site Name | Site | Number of Agents | Agents/Cluster |
|---|-------|------------------|----------------|
| Nickerson, KS [multi-site hub/data center] | Site1 | 822 | 1,016 |
| Northbrook, IL [remote of Site1] | Site2 | 194 | |
| Nash, TX [independent branch office] | Site3 | 402 | 402 |
| Newark, DE [multi-site hub/data center] | Site4 | 406 | 520 |
| Newton, MA [remote of Site4] | Site5 | 81 | |
| Norcross, GA [remote of Site4] | Site6 | 33 | |
| Northridge, CA [independent regional office] | Site7 | 220 | 220 |



Note

The number of agents per cluster at Nickerson (Site1 – 1,016) and Newark (Site4 – 520) are over the targeted numbers of 1,000 and 500 respectively. This is done deliberately to account for additional agents added to the sites to handle “conference and transfer” requests from other sites in that cluster. These agents are configured in the system, but with very low call volume, are not considered significant to the design limits of the standard configuration models.

Administrative Phones

Additionally, at each site, there are a number of “administrative” phones in conference rooms, break rooms, and manager offices. These phones generate a minimal amount of call volume, but need to be represented in the environment to model “real” call center operations.

Table 1-2 lists the number of administrative phones and the Busy Hour Call rate (BHCA) for the administrative phones per site.

Table 1-2 Number of Administrative Phones/BHCA

| Site Name | Site | Number of Admin Phones | BHCA for Admin Phones |
|---|-------|------------------------|-----------------------|
| Nickerson, KS [multi-site hub/data center] | Site1 | 64 | 240 |
| Northbrook, IL [remote of Site1] | Site2 | 22 | 44 |
| Nash, TX [independent branch office] | Site3 | 22 | 38 |
| Newark, DE [multi-site hub/data center] | Site4 | 32 | 96 |
| Newton, MA [remote of Site4] | Site5 | 11 | 17 |
| Norcross, GA (Site6) [remote of Site4] | Site6 | 11 | 14 |
| Northridge, CA [independent regional office] | Site7 | 22 | 55 |

As with any typical Telephony implementation, a standard amount of conferences and transfers are performed using the administrative phones within the same site. To model the traffic appropriately, transfers are estimated at 5% and conferences at 10% of the total BHCA for the administrative phones.

Agents and Services

Table 1-3 lists the services that the agents at the contact centers provide to the customers of GSF.

Table 1-3 Services, Activities, and Locations

| Skill # | Service | Activity | Locations |
|---------|---------------------------------|--|--|
| 01 | Account Inquiry | Statement Review, Balance Inquiry | All locations Additionally, there are sub-groups created to handle transfer and conference calls to this group from other groups |
| 02 | Literature Request | Process requests for new prospectus and other literature for customers | All locations |
| 03 | Sales and Brokerage | Selling specific securities (stocks, bonds, etc.) to customers directly | Newark (Site4), Newton (Site5), and Norcross (Site6) sites only |
| 04 | Member Banking | Internet Banking Service for customers | Nickerson (Site1), Northbrook (Site2), Nash (Site3), and Northridge (Site7) sites only |
| 05 | Customer Collections | Credit Card collections and account services Note: There are inbound groups across most of the sites | Nash (blended agents for both inbound and outbound calls), Northridge, Northbrook, Nash, Newark, Newton, and Norcross (inbound calls only) sites |
| 07 | Billing and Back Office Support | Assistance for GSF Brokers with questions on settlement statements, account problems, and billing issues | All locations |

Table 1-3 Services, Activities, and Locations (continued)

| Skill # | Service | Activity | Locations |
|---------|------------------------------|--|---------------|
| 08 | Password and Account Lockout | Support group to reset, look-up, and modify customer and broker accounts | All locations |
| 09 | Broker Technical Support | Technical support for GSF Brokers for web-based and on-line tools | All locations |

Cross-Trained Agents

GSF has cross-trained the majority of their agents at the various sites to provide a variety of services to both end-customers and brokers who resell their securities.

Nickerson, Northbrook, Nash, and Northridge Agents

GSF offers a banking service to its customers with traditional checking, savings, and investment options like money market and 401K accounts as an “internet bank” with no traditional branch banking locations.

The contact centers in the Nickerson (Site1), Northbrook (Site2), Nash (Site3), and Northridge (Site7) sites are set up to handle these customer calls and services. These sites use the CTI OS Desktop Application to handle call control functions.

Cross-trained agents in the Nash (Site3) site are also set up to perform outbound collection calls on their customer credit card accounts, blending with the inbound calls to this service.

Newark, Newton, and Norcross Agents

Agents in the Newark (Site4), Newton (Site5), and Norcross (Site6) sites are licensed to provide brokerage services and are required to monitor and record calls. Supervisors at these sites also need to monitor calls in progress on an ad-hoc basis.

These sites use the Cisco Agent Desktop (CAD) Application for the ad-hoc monitoring and recording function. These sites do not transfer nor conference any calls to any of the other sites.

Agent Profiles by Site

All the sites discussed in this section are open 24x7. The number of agents listed in the tables are the number of staffed agents per shift.

Nickerson, KS (Site1)

Site Profile

The following is a brief summary of Site1-relevant information:

- Has 822 agents who use CTI OS Desktop Application
- Handles only Cisco CallManager (CCM) Post-Routed calls
- Uses CRS for call treatment and queueing
- Has a Cisco CallManager cluster for call processing
- Operates as a data center

Table 1-4 lists the skill sets of the agents at the Nickerson site (total BHCA: 13,519) and the agent to BHCA numbers.

Table 1-4 Agent Profile for Nickerson (Site1)

| Call Flow | Skills and Services | # of Agents – BHCA |
|---------------|--|--------------------|
| Call Flow #2a | #12109 – Broker Technical Support | 480 – 8111 |
| Call Flow #2b | #12208 – Password and Account Lockout | 240 – 4055 |
| Call Flow #2c | #12307 – Billing and Back Office Support | 80 – 1351 |
| Call Flow #3a | #13101 – Transfers from Northbrook | 11 – 159 |
| Call Flow #3b | #13202 – Conferences from Northbrook | 11 – 159 |

Northbrook, IL (Site2)

Site Profile

The following is a brief summary of Site2-relevant information:

- Has 194 agents who use CTI OS Desktop Application
- Handles only CCM Post-Routed calls
- Uses CRS in Site1 for call treatment and queueing
- Uses Cisco CallManager cluster in Site1 for call processing



Note

Agents at other sites do not transfer calls to agents in Northbrook (Site2).

Table 1-5 lists the skill sets of the agents at the Northbrook site (total BHCA: 3,183) and the agent to BHCA numbers.

Table 1-5 Agent Profile for Northbrook (Site2)

| Call Flow | Skills and Services | # of Agents – BHCA |
|---------------|--|--------------------|
| Call Flow #2a | #22109 – Broker Technical Support | 114 – 1909 |
| Call Flow #2b | #22208 – Password and Account Lockout | 60 – 954 |
| Call Flow #2c | #22307 – Billing and Back Office Support | 20 – 318 |

Nash, TX (Site3)

Site Profile

The following is a brief summary of Site3-relevant information:

- Has 402 agents who use CAD Desktop Application
- Handles only CCM Post-Routed calls
- Uses CRS in Site1 for call treatment and queueing
- Has its own Cisco CallManager cluster for call processing
- Has 137 blended agents (out of 402) to handle Outbound calls

**Note**

Agents in the Customer Collections skill group handle inbound and outbound calls.

The expected call distribution statistics for inbound calls handled by the Outbound Agents are:

- BHCA for accepted inbound calls out of the total inbound BHCA: 412 – 4,427
- Total number of calls Dialed: 4338
- Number of calls Answered: 1300 (30%)
- Numbers of calls Busy: 1519 (35%)
- Number of calls Unanswered: 1519 (35%)

**Note**

Nash sends 2% of all calls to the Nickerson site as “inter-cluster” calls (conferences: 1% and transfers: 1%).

[Table 1-6](#) lists the skill sets of the agents at the Nash site (total BHCA: 4.427) and the agent to BHCA numbers.

Table 1-6 Agent Profile for Nash (Site3)

| Call Flow | Skills and Services | # of Agents – BHCA |
|---------------|--|---|
| Call Flow #2a | #32109 – Broker Technical Support | 145 – 2409 IN 137 – 1300 OUT – 412 IN |
| Call Flow #2b | #32208 – Password and Account Lockout | 74 – 1204 |
| Call Flow #2c | #32307 – Billing and Back Office Support | 24 – 401 |
| Call Flow #3a | #33101 – Transfers from Nickerson | 11 – 135 |
| Call Flow #3b | #33202 – Conferences from Nickerson | 11 – 135 |

Newark, DE (Site4)

Site Profile

The following is a brief summary of Site4-relevant information:

- Has 406 agents who use CAD Desktop Application
- Handles only ISN Post-Routed calls
- Uses the Gateway for call treatment and queuing
- Has a Cisco CallManager cluster for call processing
- Operates as a data center



Note

Of the traffic arriving at this site from Newton (Site5), up to 5% of the total BHCA are transfers and another 5% of the total BHCA are conferences.

[Table 1-7](#) lists the skill sets of the agents at the Newark site (total BHCA: 6,687) and the agent to BHCA numbers.

Table 1-7 Agent Profile for Newark (Site4)

| Site | Skills and Services | # of Agents – BHCA |
|---|--|--------------------|
| Call Flow #1 – General Information Requests | #41001 – Account Inquiry | 240 – 4012 |
| | #41002 – Literature Request | 20 – 334 |
| | #41003 – Sales and Brokerage | 60 – 1003 |
| | #41004 – Member Banking | 80 – 1337 |
| Call Flow #3a | #43101 – Transfers from Newton (Site5) | 3 – 24 |
| Call Flow #3b | #43202 – Conferences from Newton (Site5) | 3 – 24 |

Newton, MA (Site5)

Site Profile

The following is a brief summary of Site5-relevant information:

- Has 81 agents who use CAD Desktop Application
- Handles only ISN Post-Routed calls
- Uses the Gateway for call treatment and queuing
- Uses Cisco CallManager cluster in Site4 for call processing



Note

Newark (Site4) sends 5% conference and 5% transfer calls into Newton (Site5).

Table 1-8 lists the skill sets of the agents at the Newton site (total BHCA: 487) and the agent to BHCA numbers.

Table 1-8 Agent Profile for Newton (Site5)

| Site | Skills and Services | # of Agents – BHCA |
|---|--|--------------------|
| Call Flow #1 – General Information Requests | #51001 – Account Inquiry | 18 – 292 |
| | #51002 – Literature Request | 3 – 24 |
| | #51003 – Sales and Brokerage | 7 – 73 |
| | #51004 – Member Banking | 5 – 97 |
| Call Flow #3a | #53101 – Transfers from Newark (Site4) | 24 – 334 |
| Call Flow #3b | #53202 – Conferences from Newark (Site4) | 24 – 334 |

Norcross, GA (Site6)

Site Profile

The following is a brief summary of Site6-relevant information:

- Has 33 agents who use CAD Desktop Application
- Handles only ISN Post-Routed calls
- Uses the Gateway for call treatment and queuing
- Uses Cisco CallManager cluster in Site4 for call processing



Note

Agents at other sites do not transfer nor conference calls to agents at Norcross (Site6).

Table 1-9 lists the skill sets of the agents at the Norcross site (total BHCA: 487) and the agent to BHCA numbers.

Table 1-9 Agent Profile for Norcross (Site6)

| Site | Skills and Services | # of Agents – BHCA |
|---|--------------------------------------|--------------------|
| Call Flow #1 – General Information Requests | #61001 – Account Inquiry | 18 – 292 |
| | #61002 – Literature Request | 3 – 24 |
| | #61003 – Sales and Brokerage Service | 7 – 73 |
| | #61004 – Member Banking | 5 – 97 |

Northridge, CA (Site7)

Site Profile

The following is a brief summary of Site7-relevant information:

- Has 220 agents who use CTI OS Desktop Application
- Handles only ISN Post-Routed calls
- Uses the Gateway for call treatment and queuing
- Has a Cisco CallManager cluster at its own site for call processing

Table 1-10 lists the skill sets of the agents at the Northridge site (total BHCA: 3,625) and the agent to BHCA numbers.

Table 1-10 Agent Profile for Northridge (Site7)

| Site | Skills and Services | # of Agents – BHCA |
|---|------------------------------|--------------------|
| Call Flow #1 – General Information Requests | #71001 – Account Inquiry | 130 – 2175 |
| | #71002 – Literature Request | 12 – 181 |
| | #71003 – Sales and Brokerage | 35 – 543 |
| | #71004 – Member Banking | 43 – 725 |

Sample Study Call Flows

The sample call flows created for this business study reflect the typical customer business requirements and exercise specific features and functions of the IPCC Enterprise solution.

The 4 types of sample call flows discussed in this section are as follows:

- Call Flow #1—General Information Calls (Inbound using ISN Post-Route)
- Call Flow #2— Support and Billing Calls (Inbound using CCM Post-Route)
 - Call Flow #2a—Broker Technical Support Line
 - Call Flow #2b—Password Reset/Account Lockout Line
 - Call Flow #2c—Billing and Back Office Line
- Call Flow #3—Agent-Initiated Calls (Conference /Transfers using CCM Post-Route)
 - Call Flow #3a—Conference/Transfer to Another Skill Group
 - Call Flow #3b—Agent-to-Agent Transfers and queueing
 - Call Flow #3c—Agent (Supervisor) Assist Calls
- Call Flow #4—Outbound Collection Calls

Agents and the Cisco CallManager clusters at the sites handling the call flows are set up as follows:

- Cisco CallManager Cluster #1: Agents at Site1 and Site2
Traffic between Site1 and Site2 (in Cluster) 1 is considered “intra-cluster” or occurring within their “home” cluster.
- Cisco CallManager Cluster #2: Agents at Site3
Traffic between Site1 and Site3 (occurs between Cluster 1 and Cluster 2) is considered “inter-cluster” or crossing between clusters.
- Cisco CallManager Cluster #3: Agents at Site4, Site5 and Site6
Traffic between Site4, Site5, and Site6 (in Cluster 3) is considered “intra-cluster” or occurring within their “home” cluster.
- Cisco CallManager Cluster #4: Agents at Site7
Traffic between Site4 and Site7 (occurs between Cluster 3 and Cluster 4) is considered “inter-cluster” or crossing between clusters.

Typically, all call flows have inbound BHCA targeted for each specific site. As such, there should be adequate agents at each site to handle the inbound local BHCA sent to that site.

Furthermore, specific skill groups and sites are identified as targets for call “overflow” which occurs when agents are not available at the site that the call originally came in at (local site).

When a call arrives at the local site and agents are unavailable, the system checks for available agents in that skill group at other clustered sites. When selecting an overflow site, the agents that belong to the home cluster are preferred over agents in a different cluster.

For instance, using the agent and cluster set up described above, a call that comes into Site1 is first sent to agents at Site1. If agents are unavailable at Site1, then the call is sent to available agents at Site2. If agents are not available at this site either, then the call is routed to an available agent at Site3.

If agents are not available at any of the sites, the call is usually queued for an agent in that skill group at the local site (Site1 in the example). However, calls can be handled in a variety of ways depending on the call treatment logic and rules.

Refer to [Summary of Call Handling and Queueing, page 1-30](#) to understand how calls are handled for the sample call flows described in this section.

Call Flow #1: General Information Calls (Inbound using ISN Post-Route)

GSF provides its customers with local branch office numbers to call into their regional contact centers. Customers who call into these access numbers are presented with a menu of choices. Based on the selection they make, they are transferred to the local agents who provide that service for that region.

Agents and the Cisco CallManager clusters at the sites handling the ISN Post-Routed call flow are set up as follows:

- Cisco CallManager Cluster #3: Agents at Site4, Site5, and Site6
- Cisco CallManager Cluster #4: Agents at Site7

[Table 1-11](#) provides a list of the sites and their local access numbers, estimated BHCA, and agents per site for General Information Requests lines:

Table 1-11 General Information Request Local Lines

| Site | Local Number | Est. BHCA / Site | Agents / Site |
|------------------------|---------------------|------------------|---------------|
| Newark, DE (Site4) | 302-266-4636 (INFO) | 6,687 | 400 |
| Newton, MA (Site5) | 617-215-4636 (INFO) | 487 | 33 |
| Norgross, GA (Site6) | 678-344-4636 (INFO) | 487 | 33 |
| Northridge, CA (Site7) | 818-341-4636 (INFO) | 3,625 | 220 |

Call Flow Logic

The VRU (Gateway) plays a series of prompts and messages, one of which is: “Thank you for calling Global Siren Financial. Please select from one of the following services:

Press 1 if you have a question about your brokerage account or most recent statement,

Press 2 if you want to request a new prospectus on any GSF fund,

Press 3 if you are a GSF Banking customer and have a question about your account,

Press 4 if you are a GSF Broker and have questions about your customer accounts,

Or stay on the line and the next available representative will assist you.”

If the caller presses:

- 1 and an agent is available for that skill group, the call is routed to any agent at any site who has the “x1001 – Account Inquiry Skill.”
- 2 and an agent is available for that skill group, the call is routed to any agent at any site who has the “x1002 – Literature Request Skill.”
- 3 and the agent is available for that skill group, the call is routed to any agent at any site who has the “x1004 – Member Banking Skill.”
- 4 and an agent is available for that skill group, the call is routed to any agent at any site who has the “x1003 – Sales and Brokerage Skill.”
- An invalid selection, the system plays the message: “Sorry you are having difficulty. Please try again later. Good bye.” and terminates the call.

If there are no agents available in each of the skill groups or if the user does not make a selection when prompted, the call is held in queue for the next available agent in that skill group.

Call Handling and Queueing

GSF has installed the local line calling functionality to encourage local contact with the regional contact centers. All calls coming into these local lines will be “designated” to the specific site (or cluster of sites) the call arrived at. For example, local calls to the Northridge (Site7) site are answered by an agent in that skill group at that site (based on the longest available or most idle agent).

If there are no available agents, the call stays in a call queue at that site for the next available agent. Unnecessary intra-site call transfers and network usage are avoided by keeping the calls “local.”

This is possible because Site7 has its own Cisco CallManager cluster (for call processing) and its own ISN (for call prompting and queueing).

Unanswered calls remain in their respective queues, regardless of the length of time they are in queue. The number of calls in any of these queues is controlled by a variable in an “admin script”, which varies based upon conditions such as agent-to-call ratios, etc.

If there are more than 20 calls in any of these queues, the caller hears an announcement before being put on hold:

“We are experiencing heavier than normal call volumes. There are << *number of calls inserted from real time feed* >> ahead of you in this queue. You may wish to call back later for faster service.”

The system does not terminate this call. Callers who wish to wait are allowed to continue to hold in queue once this message is played. It is up to the caller’s discretion to hang up and terminate the call.

Agent to Skill Group Breakdown

For the local-line inbound traffic dealing with General Information Requests, [Table 1-12](#) lists the number of agents available for each of the related skill groups at Newark, Newton, Norcross, and Northridge.



Note

The BHCA listed in the Table 1-12 is per site.

Table 1-12 Agent per Skill Group per Site

| Site | X1001-Acct | X1002-Lit | X1004-Bank | X1007-Brk | Total |
|-------|------------|-----------|------------|-----------|-------|
| Site4 | 240 | 20 | 80 | 60 | 400 |
| Site5 | 18 | 3 | 5 | 7 | 33 |
| Site6 | 18 | 3 | 5 | 7 | 33 |
| Site7 | 130 | 12 | 43 | 35 | 220 |

Call Flow #2: Support and Billing Calls (Inbound using CCM Post-Route)

GSF provides some of their support services to its brokers and end-customers via local lines (toll calls); rather than providing toll-free service for callers to directly access agents in the branch office locations.

Call Flow #2a – Broker Technical Support

GSF provides on-line and web-based tools to brokers who re-sell GSF securities to support their business functions with GSF. Since GSF provides these services free of charge, they request their brokers to call a local access line which may be a long-distance call for the broker.

Each of the three offices has local lines that are used for this purpose. [Table 1-13](#) provides the sites and their local line numbers, estimated BHCA, and agents per site for Broker Technical Support lines:

Table 1-13 Broker Technical Support Local Lines

| Site | Local Number | Est. BHCA / Site | Agents / Site |
|------------------------|--------------|------------------|---------------|
| Nickerson, KS (Site1) | 620-422-9977 | 8,111 | 480 |
| Northbrook, IL (Site2) | 224-405-9977 | 1,909 | 114 |
| Nash, TX (Site3) | 903-319-9977 | 2,821 | 145 |

Call Handling and Queueing

Each site listed in the table has a number of Broker Technical Support agents in the “x2109 – Technical Support” group. Calls coming into this skill group originate locally.

All calls have the following announcement played prior to being delivered to an available agent:

“Your call may be monitored or recorded for quality purposes. Please hold while we transfer you.”

Initially, the site at which the call arrives attempts to satisfy the request locally. If unsuccessful, it considers available agents at the clustered sites that share a common queue point or sites that share the same Cisco CallManager cluster.

Agents and the Cisco CallManager clusters at the sites handling the CCM Post-Routed call flow are set up as follows:

- Cisco CallManager Cluster #1: Agents at Site1 and Site2
- Cisco CallManager Cluster #2: Agents at Site3

Calls of this call flow type remain in queue within the “home” cluster until an agent in that cluster becomes available. Calls do not cross cluster groupings and attempt to queue in another site cluster. For instance, calls at Site2 do not attempt to queue at Site3.

Call Flow #2b – Password and Account Lockout

Brokers and end-customers, who use GSF tools on-line and on the web, may need to have their passwords reset or accounts locked out/reset from time-to-time. To facilitate this service and provide direct access to this function, GSF provides a local number for each service center.

Each of the three offices has local lines that are used for this purpose. [Table 1-14](#) provides the sites and their local line numbers, estimated BHCA, and agents per site for Password and Account Lockout lines:

Table 1-14 Password and Account Lockout Local Lines

| Site | Local Number | Est. BHCA / Site | Agents / Site |
|-----------------------|--------------|------------------|---------------|
| Nickerson, KS (Site1) | 620-422-8877 | 4,055 | 240 |

Table 1-14 Password and Account Lockout Local Lines (continued)

| Site | Local Number | Est. BHCA / Site | Agents / Site |
|------------------------|--------------|------------------|---------------|
| Northbrook, IL (Site2) | 224-405-8877 | 954 | 60 |
| Nash, TX (Site3) | 903-319-8877 | 1,204 | 74 |

Call Handling and Queueing

Each site listed in the table has a number of Password and Account Lockout agents in the “x2208 – Password” group. Calls coming into this skill group originate locally.

Initially, the site the call arrives at attempts to satisfy the request locally. If unsuccessful, it considers available agents within its “home cluster” after locally queueing the call for 30 seconds (an adjustable variable).

Before a call can be queued to another site within the cluster, the expected wait time at the target site must be less than the expected wait time at the current site. Once a call is re-queued at another site, it is removed from the current queue and queued only at the new site.

The decision to re-queue is only done at the initial site for the call. Since calls can be queued at either Nickerson (Site1) or Nash (Site3), the agent queues at these sites are possible targets for the call.

The expected wait time is a calculation of:

$$(Number\ of\ calls\ in\ queue) * (average\ handle\ time) / (number\ of\ agents\ logged\ in) + 1$$

The target site for the call is the site which has the lowest value from the above calculation, that is, the shortest wait time.

Call Flow #2c – Billing and Back Office Support

Brokers who re-sell GSF securities occasionally have questions about their settlement statements and billing reports and need to speak with an accounting representative at GSF. Since GSF provides these services free of charge, they ask their brokers to call a local access line, which may be long-distance for the broker.

Each of the three offices has local lines that are used for this purpose. [Table 1-15](#) provides the sites and their local line numbers, estimated BHCA, and agents per site for Billing and Back Office Support lines:

Table 1-15 Billing and Back Office Local Lines

| Site | Local Number | Est. BHCA / Site | Agents / Site |
|------------------------|--------------|------------------|---------------|
| Nickerson, KS (Site1) | 620-422-7777 | 1,351 | 80 |
| Northbrook, IL (Site2) | 224-405-7777 | 318 | 20 |
| Nash, TX (Site3) | 903-319-7777 | 401 | 24 |

Call Handling and Queueing

Each site listed in the table has a group of Billing and Back Office Support agents in the “x2307 – Billing” group. Calls coming into this skill group originate locally.

Initially, the site the call arrives at attempts to satisfy the request locally. If unsuccessful, it considers available agents at other sites after locally queueing the call for 30 seconds (an adjustable variable).

A call is only moved out of its existing queue to an agent at another site if that agent is available to take the call. It will not be transferred between sites for placement in a queue at another site.

Call Flow #3: Agent-Initiated Calls (Conference/Transfers using CCM Post-Route)

Once a call is answered by an agent, the agent may need to perform additional call processing manually using the conference and transfer features of IPCC.

Based on historical volumes, GSF expects that agents will need to transfer 5% of all calls terminating with them using a Post-Route that they have initiated. Additionally, another 5% of conferences would be comprised of premium customers, who are identified by the system when they call a special toll-free number. The original agent, as a courtesy, would conference premium customer calls to the agent from the second skill group, instead of doing a “blind” transfer

Typically, calls conference/transfer between agent groups are “designated” to the same service or Cisco CallManager cluster. For instance, Northbrook (Site2) calls that transfer or conference typically only go to Nickerson (Site1) or intra-cluster traffic. In the same manner, Newark (Site4) calls only go to Newton (Site5) or Norcross (Site6).

It is unlikely, but occasionally possible, that calls can conference/transfer between the two Cisco CallManager clusters (inter-cluster) in the same distributed configuration. Approximately, 1% of calls are transferred from Nickerson (Site1) to Nash (Site3) and, likewise, from Newark (Site4) to Northridge (Site7).

Call Flow #3a – Conference/Transfer to Another Skill Group

When callers mistakenly select wrong menu choices or dial wrong numbers, the agent taking the call may need to re-direct the caller to a different agent in a specific skill group to handle their request.

Rather than asking the customer to call back, GSF wants the agents to re-qualify calls using the same routing logic that would have been used if the caller had made the correct choice initially.

Agents at all the sites use the Cisco's Intelligent Contact Management (ICM) Dialed Number Plan for making conference and transfer calls.

The agent handling the transfer/conference call initiates the transfer/conference to a remote site within the same cluster or a different cluster.

If the agent for that targeted skill group is not available, then the call is queued at the CRS in the home cluster until the agent becomes available.

Call Handling and Queueing

An example of this type of transfer is as follows:

1. A caller presses "1" accidentally when really wanting to press "4". The caller is routed to the Account Inquiry group instead of the Sales and Brokerage group at Nickerson (Site1).
2. The caller explains the service required to the Account Inquiry agent who takes the call.
3. The agent realizes that customer has made the wrong selection and a transfer is required to route the caller to the Sales and Brokerage group.
4. The agent uses the system transfer numbers listed in [Table 1-16](#) to transfer the call to the correct agent group.

Table 1-16 System Transfer Numbers

| To move a call to the ... group | Use Conference/Transfer and press... |
|---------------------------------|--------------------------------------|
| Account Inquiry | 4001 |
| Literature Request | 4002 |
| Sales and Brokerage | 4003 |
| Member Banking | 4004 |

**Note**

Not all sites use a four-digit dial plan. For those that use longer dialing plans, add another “4” in front of the number.

5. If dealing with a VIP customer, the agent can “conference” to stay on the line with the customer and introduce the customer to the new (Sales and Brokerage) agent. This is a “consultative transfer”.
6. The system then searches for Sales and Brokerage agents as follows:
 - If an agent from this group is not available at Nickerson (Site1), the system considers agents at other sites in the inter-cluster grouping, that is, first at Northbrook (Site2) and only then at Nash (Site3).
 - If no agents are available in that skill group at any location, the system queues the call at the current location for an agent in the local site.

Once the call is queued, the system plays an announcement telling the caller the number of calls already in queue for this service (using a real-time message).

Call Flow #3b – Agent-to-Agent Transfers and Queueing

At each site, there are several agents designated as “Super Agents” who handle customer escalations for any service group.

Additionally, in this role, customers may call and specifically ask for one of these agents by name. When this occurs, an agent may need to transfer the call directly to a specific agent and/or queue the call to them.

Table 1-17 provides a list of these Super Agents and their Agent IDs by site.

Table 1-17 Site Super" Agents

| Site | Agent ID | Agent Name |
|------------------------|----------|------------------|
| Nickerson, KS (Site1) | 19901 | HARRY JONES |
| | 19902 | SARAH BROWN |
| | 19903 | GEORGE HILL |
| | 19904 | BOB WEST |
| | 19905 | MARY SMITH |
| | 19906 | KEVIN HOLIDAY |
| | 19907 | KELLY JOHNSON |
| Northbrook, IL (Site2) | 29901 | BILL GREEN |
| | 29902 | SALLY WADE |
| | 29903 | TIM WRIGHT |
| | 29904 | ALLEN TIMOTHY |
| | 29905 | JADE EASTON |
| Nash, TX (Site3) | 39901 | NICHOLAS PARSONS |
| | 39902 | EVAN PEACE |
| | 39903 | JOY RIGBY |
| | 39904 | LINDA O'DELL |

Table 1-17 Site Super™ Agents (continued)

| Site | Agent ID | Agent Name |
|------------------------|----------|------------------|
| Newark, DE (Site4) | 49901 | KAREN BUSH |
| | 49902 | WENDY TRUMP |
| | 49903 | WESLEY COLE |
| | 49904 | DAVID KLEIN |
| | 49905 | MATT HOUSLEY |
| | 49906 | TRAVIS TOOLMAN |
| | 49907 | CARL CARLSON |
| Newton, MA (Site5) | 59901 | TRUDY GOODE |
| | 59902 | SAM ADAMS |
| | 59903 | BENNY FRANKLIN |
| Norcross, GA (Site6) | 69901 | MELVIN PATTERSON |
| | 69902 | ROBERT BUTLER |
| | 69903 | MARY MEADE |
| Northridge, CA (Site7) | 79901 | LIZ CRUISE |
| | 79902 | HOLLY VINE |
| | 79903 | WOODY STREETER |
| | 79904 | KEVIN MANN |
| | 79905 | MISSY BELMAN |
| | 79906 | EVA TOLE |

Call Handling and Queueing

If a customer specifically requests any of these agents and:

- The agent is logged on and available, their call is directly transferred to the agent transfer number, regardless of their site or location.
- The agent is not logged on, the system does not queue the call but plays the following message back to the caller and then disconnects the call:

“I’m sorry, the person you are trying to reach is not currently on site. Please try your call again later.”

- If the agent is logged on, but unavailable while talking on another call, the call is queued for that specific agent. The caller hears this message as their call is placed in the queue:

“I’m sorry, the person you are trying to reach is currently on the phone assisting another customer. There are” *<insert number>* “calls already in queue for this person. If you wish to hold, please stay on the line and you will be handled in the order you called. If you prefer not to wait at this time, please hang up and try your call again later.”

These “super” agents log into a separate skill group that is not used in any other call routing logic other than the one discussed above. Their sole function is to take direct callbacks from customers who are transferred directly to them by agents from other sites.

Call Flow #3c – Agent (Supervisor) Assist Calls

Agents may sometimes require supervisor assistance on the call they are currently handling. Each site has a number of supervisors assigned to each skill group at the site, one supervisor being responsible for 15 agents in the group. Typically, a group of 130 agents can have 9 supervisors assigned to that skill group at that site.

Call Handling and Queueing

If the agent needs assistance during a call, they can use the “supervisor assist” or “emergency assist” button on the agent desktop to have the system automatically find and conference in an available supervisor for that skill group.

- The system tries to locate a supervisor for that group first locally within the site.
- If not locally available, it tries to locate one across the sites.

- In the event that no supervisor is available anywhere in the system, the agent gets a message from the desktop that says “no supervisor available.”

The system then places the call in queue for the next available supervisor.

Call Flow #4 – Outbound Collection Calls

The outbound Customer Collections group performs follow-up calls to GSF customers. The Customer Collections group at Nash (Site3) has 137 agents who blend inbound and outbound calling using the “collections” campaign.

The group of 137 agents make an estimated 1,300 BHCA outbound calls and an inbound BHCA of 412. This number refers to the number of successful calls, which is estimated at 30% of the calls placed by the Outbound Option Dialer as shown below:

Total Calls Answered: 1,300 – 30%

Total Calls Busy: 1,519 – 35%

Total Calls no Answer: 1,519 – 35%

Total Calls Placed: 4,338

Outbound calls are attempted by the Outbound Option Dialer only once per call campaign. Calls that are busy or not answered will not be re-dialed during the same campaign.

The outbound calls are handled in a predictive dialer where the system attempts to dial several calls at once. This is done because some of the calls do not complete due to bad numbers, busy lines, or other problems in the phone network. When the system connects with the dialed customer, an agent is connected to the customer to perform the collections request.

If the customer asks the agent to call back later, the agent can schedule the system, using the “personal callback” feature, to call the customer back at a scheduled time.

At the Nash (Site3) site, calls are made in the “Predictive” Mode, using agents from the “34105 – Customer Collections” group to make the outbound calls as well as taking inbound calls.

Emergencies and Special Situations

If a site has to be closed for an emergency, for instance, a bomb threat, a special site emergency skill group is defined with a specific agent associated with it. All the standard call flows check to make sure the emergency agent has not logged into the emergency skill group, before attempting to process the call for that site.

- If a site is closed in an “emergency close” situation, all calls ignore the local agents for that closed site and consider only agents from other sites, provided they are also not closed for the same reason. If all sites are in “emergency close” mode, the system acts as if the company is closed or outside of normal calling hours.

Calls queued for a site that is in “emergency close” will be re-qualified to select another site for the queue.

- If a site is not closed and is scheduled to be open, but the agents are unable to log in for some reason (snow storm, black-out, etc.), the system does not accept calls into the queues for that site and treats the site as if it was closed.
- If a site is closed due to a national holiday, customers’ calls into the contact centers are treated similar to the “outside of normal calling hours” closure and a message informs the caller that the company is closed for the holiday.

Summary of Call Handling and Queueing

Based on routing scripts defined by the business logic, it can be seen that the IPCC Enterprise system handles and queues different types of calls in a variety of ways.

[Table 1-18](#) summarizes this information and lists the different types of sample call flows discussed previously, the sites that are eligible to handle them, and their treatment by the IPCC Enterprise system.

1

Table 1-18 Summary of Call Handling and Queueing

| Call Flow# | Call Type | Eligible Sites | Call Treatment by System |
|----------------------|--------------------------------------|---|---|
| Call Flow #1 | General Requests | Local site only | <ul style="list-style-type: none"> • Queues locally until agent is available. • Does not permit crossing to other sites, even within the same cluster. • If more than 20 calls in queue, plays message to call back. • Caller must terminate call by hanging up. |
| Call Flow #2a | Broker Technical Support | Local site first and then within “home” cluster | <ul style="list-style-type: none"> • Queues within the same cluster until agent is available. • Does not permit inter-cluster traffic. |
| Call Flow #2b | Password and Account Lockout Support | Local site first and then within “home” cluster | <ul style="list-style-type: none"> • Queues locally for a variable amount of time. • Does not permit inter-cluster traffic. • Calculates wait time for agents at other sites and compares with local site. • Queues at new site if wait time there is less than at local site. Then removes from queue at local site. |
| Call Flow #2c | Billing and Back Office Support | Local site first and then all other sites | <ul style="list-style-type: none"> • Queues locally for a variable amount of time. • Permits inter-cluster traffic. • Transfers to other sites only if agent is available to take the call. • Does not remove from original queue and place in another queue. |
| Call Flow #3a | Conf/Transfer to Another Skill Group | Local site first, then within “home” cluster, and then within clustered groupings | <ul style="list-style-type: none"> • Checks for and transfers to agents who can immediately take the call. • If agent is unavailable at all eligible sites, places in queue locally for the new skill group at higher priority. |

Table 1-18 Summary of Call Handling and Queueing (continued)

| Call Flow# | Call Type | Eligible Sites | Call Treatment by System |
|----------------------|--|---|---|
| Call Flow #3b | Agent-to-Agent Transfer | All sites (wherever the agent is located) | <ul style="list-style-type: none"> • If agent is logged on and available, transfers directly to agent. • If agent is not logged on, plays message that agent is unavailable and terminates the call. • If agent is logged on but taking another call, places in queue for that agent and plays message to wait or terminate call. |
| Call Flow #3c | Supervisor Assist | Local site first and then all other sites | <ul style="list-style-type: none"> • Checks for supervisor to assist agent. • If supervisor is unavailable, places in queue until supervisor is available. |
| Call Flow #4 | Outbound Collection | Only Site3 handles outbound calls | <ul style="list-style-type: none"> • Uses Predictive Dialer. • If called party answers, connects call to agent. • If called party does not answer, does not try the call again within campaign time. • If called party asks agent to call back, uses “personal callback” feature to call customer back at scheduled time. |
| Special Calls | Shutdown due to Emergency, Bad Weather, or Holiday | All sites | <ul style="list-style-type: none"> • If the site is closed, does not consider the site for calls. • If call is queued at closed site, reroutes to an open site. • If all sites are closed, does not accept calls into queues, and plays site “closed” message. |



Test Scenarios and Site Models

This chapter describes the test site scenarios and models that were designed and tested as part of the IP Communications Systems Test Release 3.0 for IPCC Enterprise.

This chapter contains the following sections:

- [Tested Scenarios, page 2-2](#)
- [Topology of the Seven Sites, page 2-6](#)
- [Tested Site Definitions, page 2-10](#)

In [Chapter 1, “Test Case Study”](#), we discussed and defined business requirements that would require an IPCC Enterprise solution for a sample business company with contact centers.

For guidelines, recommendations, and best practices to help you design and deploy enterprise networking solutions based on your specific business needs and requirements, refer to the Cisco Solution Reference Network Design (SRND) guides, which are available at this URL: <http://www.cisco.com/go/srnd>

Seven different test sites or models have been designed to reflect two test scenarios and the sample business profile discussed in Chapter 1. The sites are configured and deployed based on the customer’s system requirements and testing is done to validate the interoperability of the IPCC Enterprise components.

Tested Scenarios

The two test scenarios include:

- Multi-Site Centralized
- Multi-Site WAN Distributed

The tested scenarios involve an IPCC Multi-Site Distributed Deployment Model encompassing two Multi-Site Centralized configurations.

The following seven separate sites or models make up these configurations:

- Nickerson/[Site1: Data Center Site, page 2-10](#)
- Northbrook/[Site2: Remote Site, page 2-15](#)
- Nash/[Site3: Branch Office Site, page 2-18](#)
- Newark/[Site4: Data Center Site, page 2-23](#)
- Newton/[Site5: Remote Site, page 2-28](#)
- Norcross/[Site6: Remote Site, page 2-31](#)
- Northridge/[Site7: Regional Office Site, page 2-34](#)

Refer to the [Topology of the Seven Sites, page 2-6](#) for a complete map of the seven sites, their individual topologies, and the relationship between the sites.

Typically, a model deploying centralized call processing servers or voice gateways is adequate for an enterprise with small remote sites or offices in a metropolitan area. However, a distributed deployment model is more efficient as sites become larger or more geographically disperse.

Contact centers are referred to by their unique site numbers from this chapter on.

Multi-Site Centralized

In the multi-site WAN model with centralized call processing, the Cisco CallManager cluster resides at a central (or hub) campus and communications with remote offices take place over the IP WAN. The central site provides the call processing services for the remote sites.

This model also contains distributed voice gateways for locally dialed calls.

Site Relationships

The multi-site centralized scenario is composed of a Large Site and a Medium Site acting as hubs with various-sized sites acting as their remote sites.

A distributed data center is implemented at the two data center locations, for geographic redundancy of the IPCC Central Controller components (Call Router/Logger known as Rogger), and is split across the WAN.

- Site1 and Site2 participate in one of the multi-site centralized configurations.
- Site1 is the first data center and acts as the hub for Site2 and Site3.
- Site4, Site5, and Site6 participate in the other multi-site centralized configuration.
- Site4 is the second data center and acts as the hub for Site5, Site6, and Site7.

Multi-Site WAN Distributed

In the multi-site WAN model with distributed call processing, typically, each site has its own Cisco CallManager cluster. Similar to the multi-site centralized scenario, sites in the multi-site WAN distributed model are deployed with distributed voice gateways. Communication between sites takes place over the IP WAN.

Site Relationships

In the multi-site distributed configuration, several sites have their own Cisco CallManager clusters and are interconnected with inter-cluster trunks. Connectivity between the sites is provided by a WAN router through a Frame Relay cloud.

- In addition to Site1 and Site4, Site3 (branch site) and Site7 (regional site) have Cisco CallManager clusters resident at their sites for independent call processing.
- Site2 depends on Site1 for providing call processing functionality and Site5 and Site 6 depend on Site 4 for their call processing.

Call Center Routing Models

The 2 types of call routing models are implemented as follows:

- CCM Post-Routed call flow—Site1 and Site3 participate in one multi-site WAN distributed configuration with distributed call processing for this call flow.
Site3 with blended agents participates in the Outbound Option call flow.
- Internet Service Node (ISN) Post-Routed call flow—Site4 and Site7 participate in the other distributed configuration with distributed call processing for this type of call flow.

Test Sites Deployment

In this section, we discuss how IPCC software, Network Management, Security, Customer Response Solutions (CRS), and ISN are implemented at the test sites.

IPCC Enterprise Edition

IPCC Enterprise Edition software is deployed at the test sites in this test environment. With IPCC Enterprise Edition, the contact center manager can configure agents to handle inbound and outbound voice, Web collaboration, text chat, and e-mail requests. The agents can switch between these media on a task-by-task basis. Customers can choose the medium that is most comfortable and convenient for them. IPCC Enterprise can be used in a single-site environment or integrated into a multi-site contact center.

For purposes of this manual, we will refer to the IPCC Enterprise environment throughout this manual simply as IPCC.

Network Management

Network Management is implemented at all the test sites by using the following reporting tools:

- Alarm Tracker, for tracking alarms on ICM servers, presents a high-level overview of the status for customers' ICM nodes, events and alarms, and allows monitoring in a single application.

- Perfmon counters, for all windows-based servers, collects and displays system and device statistics in real time. The counters contain simple, useful counts such as number of registered phones, number of active calls, and number of available conference bridge resources.

Security

Security is implemented at the various sites as follows:

- IPSec (implemented in tunnel mode across the WAN) is used to encrypt traffic between Site1 and Site7 and Site4 and Site7.
- Cisco Security Agent (CSA) is implemented on the Cisco CallManager, ICM, ISN, and on the CRS platform.

CSA agents are implemented in managed mode to provide a central means of importing, editing, and distributing policies, providing software updates, and maintaining communications to the agents from the Cisco Works Management Center for CSA.

CRS

The Cisco CRS implementation at the test sites includes the Cisco IP Interactive Voice Response (IP IVR) product. IP IVR is a multimedia (voice, data, and web) IP-enabled interactive voice response solution that automates call handling by autonomously interacting with contacts. Using Cisco IP IVR, one can create applications that answer calls, provide menu choices for callers, obtain caller data such as passwords or account identification, and transfer calls to caller-selected extensions.

IP IVR is a part of the IPCC Enterprise solution, which is capable of distributing calls to multiple sites and performing pre- and post-routing functions. IPCC Enterprise uses ICM software to direct calls to other systems, such as interactive VRUs and ACD (Automated Call Distribution) systems.

For purposes of this manual, we will refer to this version of the CRS implementation interchangeably as CRS or as IP IVR as appropriate.

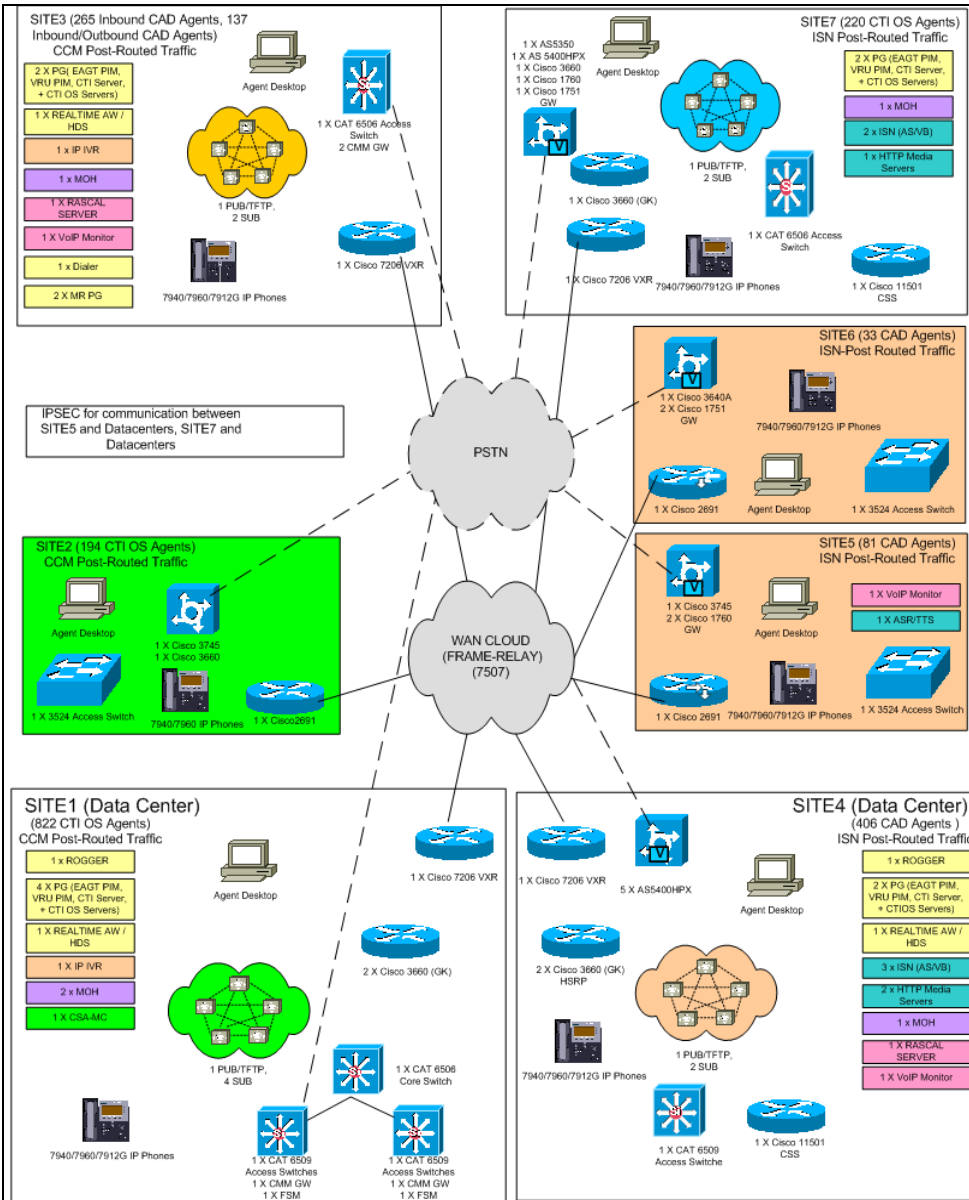
ISN

The Cisco Internet Service Node (ISN) provides interactive voice response and queueing capabilities in an IP environment and supports automated speech recognition (ASR) and text-to-speech (TTS) capabilities. ISN, which is implemented at this test environment in the comprehensive mode, includes support for agent queueing, multi-site call switching, and speech-enabled and touch-tone applications. ISN consists of the Voice Browser which plays media files to the caller and collects information in return, and the Application Server which interprets messages from ICM and generates VXML documents that it uses to communicate with the Voice Browser.

Topology of the Seven Sites

The topology and relationships of the seven sites used in the above configurations is shown in [Figure 2-1](#):

Figure 2-1 Topology of Seven Sites used in IP Communications Systems Tests



Snapshot of Site Components

Table 2-1 provides a comprehensive view of the different components deployed at the various sites. For specific component names and quantities, refer to the individual site descriptions in this chapter.

Table 2-1 Comprehensive Site Components List

| Components | Site1 | Site2 | Site3 | Site4 | Site5 | Site6 | Site7 |
|---------------------------|--------|-------|-------|-------|-------|-------|-------|
| Hub/Data Center | X | | | X | | | |
| Remote Site | | X | | | X | X | |
| Regional/Branch Site | | | X | | | | X |
| Agents | 822 | 194 | 402 | 406 | 81 | 33 | 220 |
| BHCA | 13,519 | 3,183 | 4,427 | 6,687 | 487 | 487 | 3,625 |
| Cisco CallManager Cluster | X | | X | X | | | X |
| Domain Controller | X | | | X | | | |
| Rogger | X | | | X | | | |
| IPCC PG | X | | X | X | | | X |
| Media Routing PG | | | X | | | | |
| Gatekeeper | X | | | X | | | X |
| CMM (MGCP) Gateway | X | | X | | | | |
| IOS (MGCP) Gateway | | X | | | | | |
| ISN (VXML) Gateway | | | | X | X | X | X |
| Access Router | X | X | X | X | X | X | X |
| Access Switch | X | X | X | X | X | X | X |
| Core Switch | X | | X | X | | | X |
| Content Switch | | | | X | | | X |

Table 2-1 Comprehensive Site Components List (continued)

| Components | Site1 | Site2 | Site3 | Site4 | Site5 | Site6 | Site7 |
|---|-------|-------|-------|-------|-------|-------|-------|
| CTI/CTI OS Server (co-resident on IPCC PG) | X | | X | X | | | X |
| DHCP Server (on router) | X | X | X | X | X | X | X |
| HTTP Media Server | | | | X | | | X |
| ISN AS/VB | | | | X | | | X |
| ASR/TTS | | | | | X | | |
| OSR/OSDN/Speechify Servers | | | | | X | | |
| CAD Server | | | X | X | | | |
| VoIP Monitor Server | | | X | X | X | | |
| IP Phones | X | X | X | X | X | X | X |
| CRS (IP IVR) | X | | X | | | | |
| CAD Agent/Supervisor Desktop | | | X | X | X | X | |
| CTI OS Agent/Supervisor Desktop | X | X | | | | | X |
| Outbound Option Dialer | | | X | | | | |
| RTAW/HDS/Webview | X | | X | X | | | |
| CER/MOH | X | | X | X | | | X |
| HW Conference/MTP | X | | X | X | | | X |
| CSA | X | | X | X | | | X |
| Alarm Tracker/Perfmon | X | | | X | | | |
| 3rd Party Software | X | X | X | X | X | X | X |
| WAN Router Connectivity | X | X | X | X | X | X | X |

Tested Site Definitions

The following sections describe the site models that were used to deploy the various test scenarios. Each section defines the design characteristics of an individual site and includes logical and physical topology maps and a site equipment table.

Site1: Data Center Site

Site Characteristics

Site1 is the hub and the data center in a Multi-Site Centralized configuration along with Site2 acting as its remote office. It also participates in the Multi-site WAN Distributed configuration.

The test site is deployed as follows:

- Agents:
 - 822 agents use CTI OS Desktop Application for call control functions.
 - Calls arriving at this site have a BHCA of 13,519.
- Call Flows:
 - CRS at this site is used for menu prompting and call queue management at Site1 with 103 IP IVR ports, at Site2 with 33 ports, and at Site3 with 46 ports.
 - The Catalyst CMM acts as a gateway and is used to terminate the CCM Post-Routed traffic from the PSTN.



Note There is no ISN Post-Routed traffic coming into Site1.

- Call Processing/Routing:
 - The Router and Logger are co-resident (referred to as a Rogger) on ICM and provide enterprise-wide ICM capability by distributing voice and data from multiple channels to enterprise resources.
 - The central database is associated with the Logger. The Historical Database Server (HDS) is installed on the Real-Time Admin Workstation (RT AW).

- The ICM Rogger (Side A) is located at this hub. There is a dedicated private and separate visible WAN connection to the ICM Rogger (Side B) at Site4.
- Infrastructure:
 - Two Gatekeepers (GKs) are implemented in a GUP cluster configuration.
 - The IPCC PG, which is used to interface with the peripherals, has two Peripheral Manager Interfaces (PIMs) (CCM and CRS), CTI Server, and CTI OS Server co-resident on it.
 - The Catalyst CMM acts as a gateway connected directly to the WAN and indirectly to the PSTN.
 - A WAN router provides connectivity to other sites through a Frame Relay cloud.
 - A DHCP Server (on the router) provides IP addresses to the IP phones at the site.
- Network Management:
 - Perfmon and Alarm Tracker are used for network reporting.
- Redundancy and Failover:
 - For the Cisco CallManager cluster, there are 1 Publisher/TFTP and 4 Subscribers in 1:1 load sharing mode.
 - The second Rogger at Site4 provides data center redundancy for this site.
 - Failover capabilities are in place for the Cisco CallManager and the IPCC Peripheral Gateway (PG).
- Security:
 - CSA is implemented on ICM, Cisco CallManager, and CRS.
 - All traffic from Site1 to Site7 is encrypted.

Figure 2-2 shows the logical topology of the large hub site.

Figure 2-2 Site1 Logical Topology

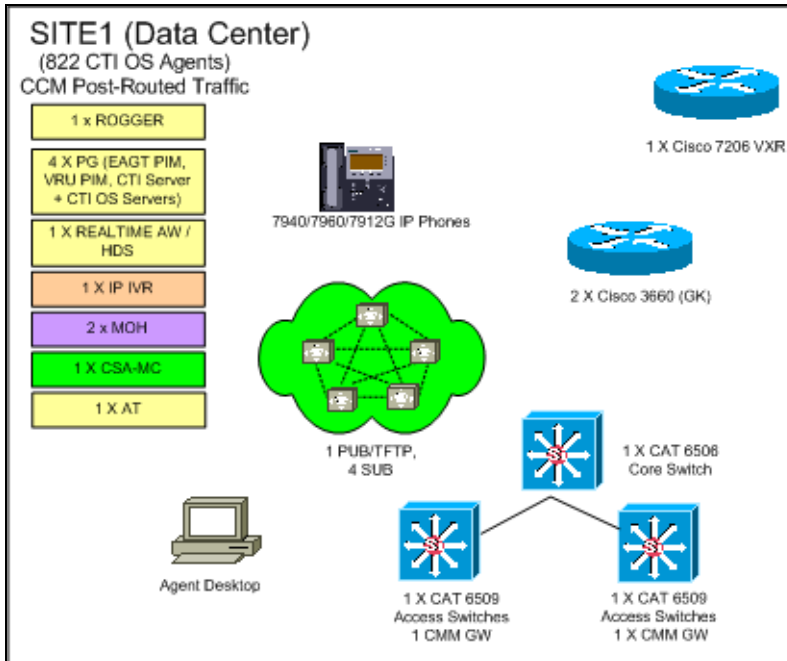


Table 2-2 lists the equipment and hardware platforms used in the large hub site. Use the reference information in the table to access corresponding software versions and model numbers.

Table 2-2 Site1 Equipment List

| Component | Hardware Platform | Qty | Reference |
|---------------|-------------------|-----|--|
| Access Switch | Catalyst 6509 | 2 | Catalyst 6500 Series, page 3-3 |
| Access Router | Cisco 7206VXR | 1 | Routers, page 3-13 |

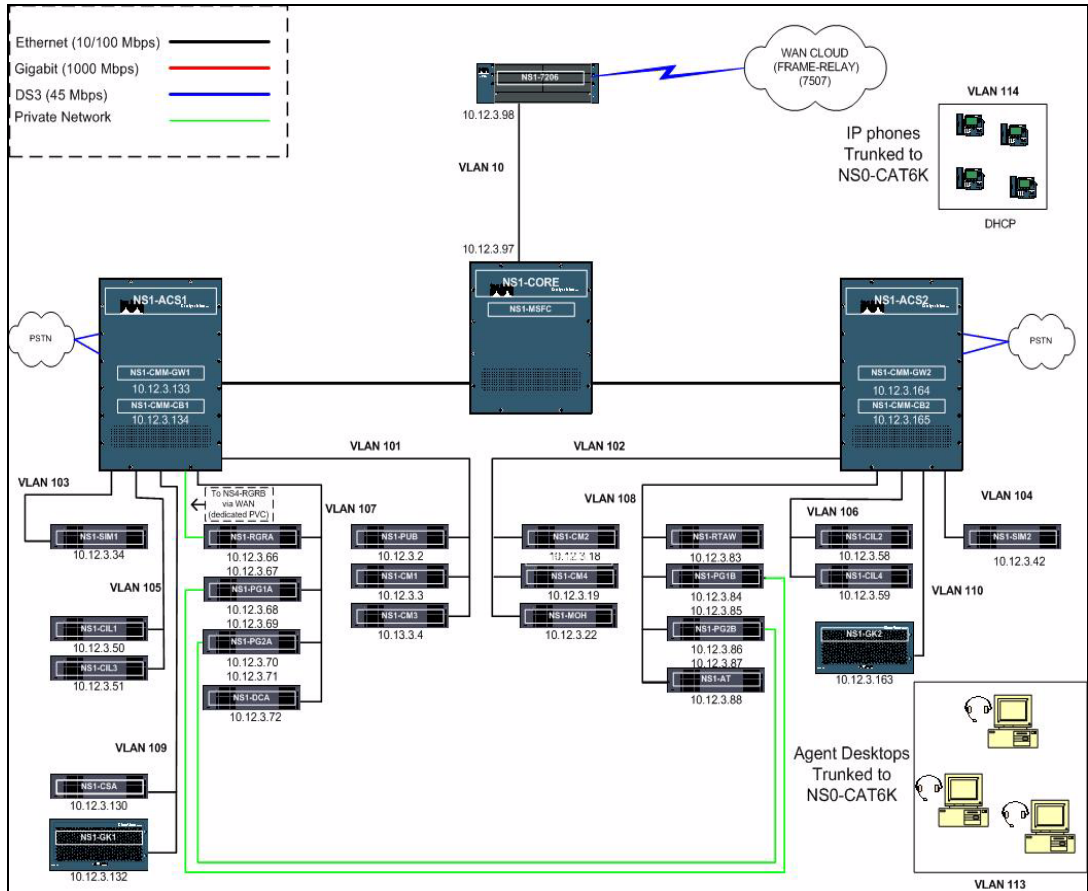
Table 2-2 Site1 Equipment List (continued)

| Component | Hardware Platform | Qty | Reference |
|-------------------------------------|---|-----|--|
| Cisco CallManager | MCS-7845H-3000 (Battery Backup w/Cache) | 9 | Cisco CallManager, page 3-3 |
| CRS (formerly CRA) | MCS-7845H-2.4-EVV1 | 1 | CRS, page 3-6 |
| CMM Gateway | Catalyst 6500 | 2 | Catalyst 6500 Series, page 3-3 |
| Core Switch | Catalyst 6506 | 1 | Catalyst 6500 Series, page 3-3 |
| CTI OS Agent and Supervisor Desktop | Pentium IV Desktop | 3 | CTI OS, page 3-7 |
| Domain Controller | MCS-7845H-2.4-EVV1 | 1 | ICM, page 3-9 |
| Gatekeeper | Cisco 3660 | 2 | Gateways/Gatekeepers, page 3-8 |
| HW Conference/MTP | Catalyst 6506 CMM (ACT) | 2 | Catalyst 6500 Series, page 3-3 |
| IPCC Peripheral Gateway (PG) | MCS-7845H-2.4-CC1 | 4 | ICM, page 3-9 |
| IP Phones | Cisco IP Phones 7940/7960/ 7912G | 10 | Phones, page 3-12 |
| Music on Hold (MOH) | MCS 7835-1266 | 2 | Cisco CallManager, page 3-3 |
| Rogger | MCS-7845H-3000 (no battery cache) | 1 | ICM, page 3-9 |
| RTAW /HDS / WebView | MCS-7845-1400 | 1 | ICM, page 3-9 |

Tested Site Definitions

Figure 2-3 shows the physical topology of the large hub site displaying the equipment listed in Table 2-2.

Figure 2-3 Site1 Physical Topology



Site2: Remote Site

Site Characteristics

Site2 is a small remote office of Site1 which is the hub in the Multi-Site Centralized configuration. It participates in the Multi-site Distributed WAN configuration.

The test site is deployed as follows:

- Agents:
 - 194 agents use CTI OS Desktop Application for call control functions.
 - Call arriving into this site have a BHCA of 3,183.
- Call Flows:
 - The IOS gateway is used to terminate the CCM Post-Routed traffic from the PSTN.
 - Agents from other sites do not transfer calls to agents in Site2.
- Infrastructure:
 - A WAN router provides connectivity to other sites through a Frame Relay cloud.
 - A DHCP Server (on the router) provides IP addresses to the IP phones at the site.

Figure 2-4 shows the logical topology of the small remote site associated with Site1.

Figure 2-4 Site2 Logical Topology

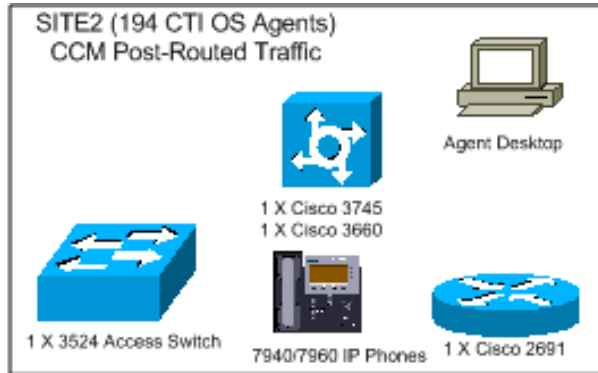


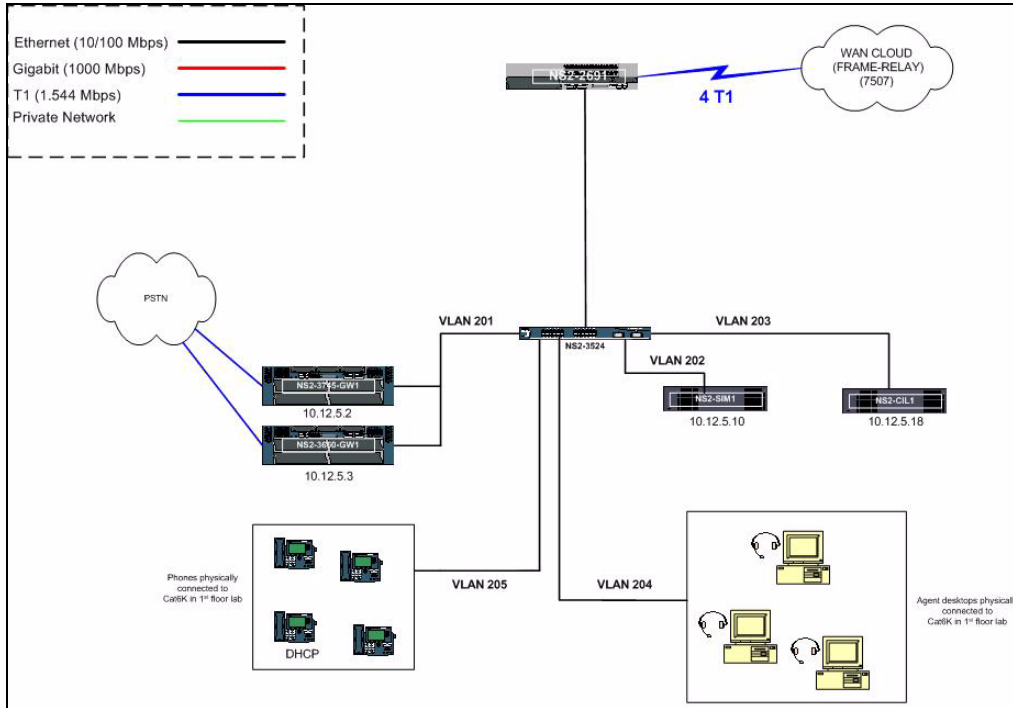
Table 2-3 lists the equipment and hardware platforms used in the remote site. Use the reference information in the table to access corresponding software versions and model numbers.

Table 2-3 Site2 Equipment List

| Component | Hardware Platform | Qty | Reference |
|-------------------------------------|---------------------------------|-----|--|
| Access Switch | Catalyst 3524 | 1 | Catalyst 3500 Series, page 3-2 |
| Access Router | Cisco 2691 | 1 | Routers, page 3-13 |
| CTI OS Agent and Supervisor Desktop | Pentium IV Desktop | 1 | CTI OS, page 3-7 |
| IOS Gateway | Cisco 3745 | 1 | Gateways/Gatekeepers, page 3-8 |
| IOS Gateway | Cisco 3660 | 1 | Gateways/Gatekeepers, page 3-8 |
| IP Phones | Cisco IP Phones 7940/7960/7912G | 10 | Phones, page 3-12 |

Figure 2-5 shows the physical topology of the small remote site displaying the equipment listed in Table 2-3.

Figure 2-5 Site2 Physical Topology



Site3: Branch Office Site

Site Characteristics

Site3 is a medium-sized office which participates in the Multi-site Distributed configuration across the WAN with Site1.

The test site is deployed as follows:

- Agents:
 - 402 agents use Cisco Agent Desktop (CAD) Application to handle both inbound calls from the PSTN and ICM–initiated outbound calls.
 - 265 agents handle the inbound calls and 137 “blended” agents handle both inbound and outbound calls.
 - Calls arriving at this site have a BHCA of 4,427 and outbound calls leaving Site3 have a BHCA of 4,338.
- Call Flows:
 - Media Routing Peripheral Gateway (MR PG) is used only for the Outbound Option on calls and has built-in Outbound Option Dialer-related functionality.
 - Catalyst CMM is used to terminate the CCM Post-Routed traffic from the PSTN and outbound calls as well.
- Call Processing/Routing:
 - The HDS is installed on the RT AW.
- Infrastructure:
 - In the Cisco CallManager cluster, there are 1 Publisher/TFTP and 2 Subscribers in 1:1 load sharing mode.
 - The IPCC PG, which is used to interface with the peripherals, has two PIMs (CCM and CRS), the CTI Server, and the CTI OS Server co-resident on it.
 - PGs and RT AWs communicate with the central controllers located at the data center (both Site1 and Site4 are data centers) via a visible WAN link.
 - A WAN router provides connectivity to other sites through a Frame Relay cloud.
 - A DHCP Server (on the router) provides IP addresses to the IP phones at the site.

- VoIP Monitor Servers are used by Supervisors to perform ad-hoc monitoring of calls to agents.
 - CAD servers are used to control the CAD Agent Desktop Application used by agents at this site.
 - The HTTP Media Server stores the media files used by the ISN for playing customer prompts.
- Network Management:
 - Perfmon and Alarm Tracker are used for network reporting.
- Redundancy and Failover:
 - Failover capabilities are in place for the Cisco CallManager, IPCC PG, MR PG and Outbound Option Dialer.
- Security:
 - CSA is implemented on ICM, Cisco CallManager, and CRS.

Figure 2-6 shows the logical topology of the medium site in the same multi-site distributed configuration as Site1.

Figure 2-6 Site3 Logical Topology

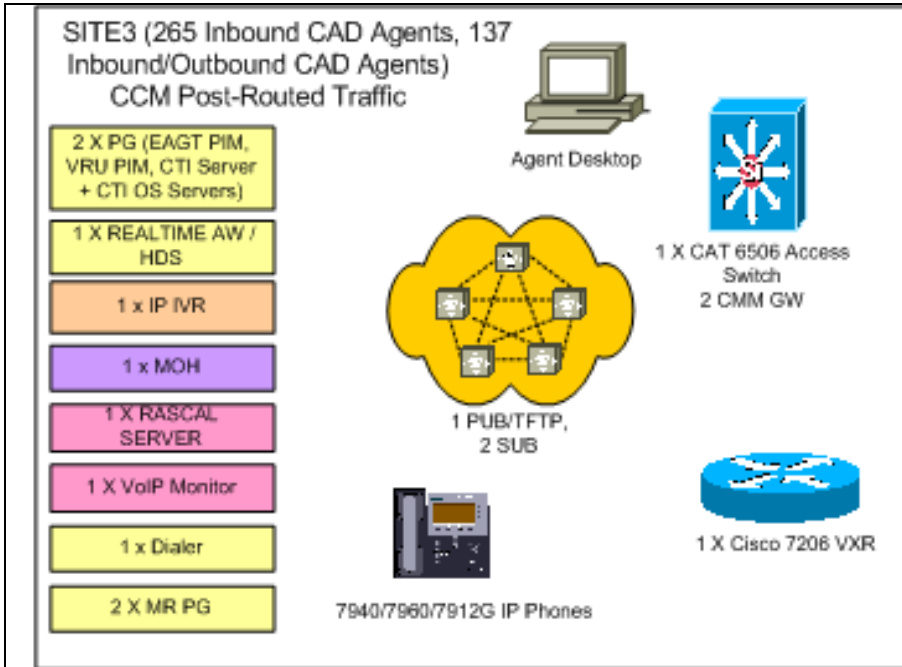


Table 2-4 shows the equipment and hardware platforms used in the medium site. Use the reference information in the table to access corresponding software versions and model numbers.

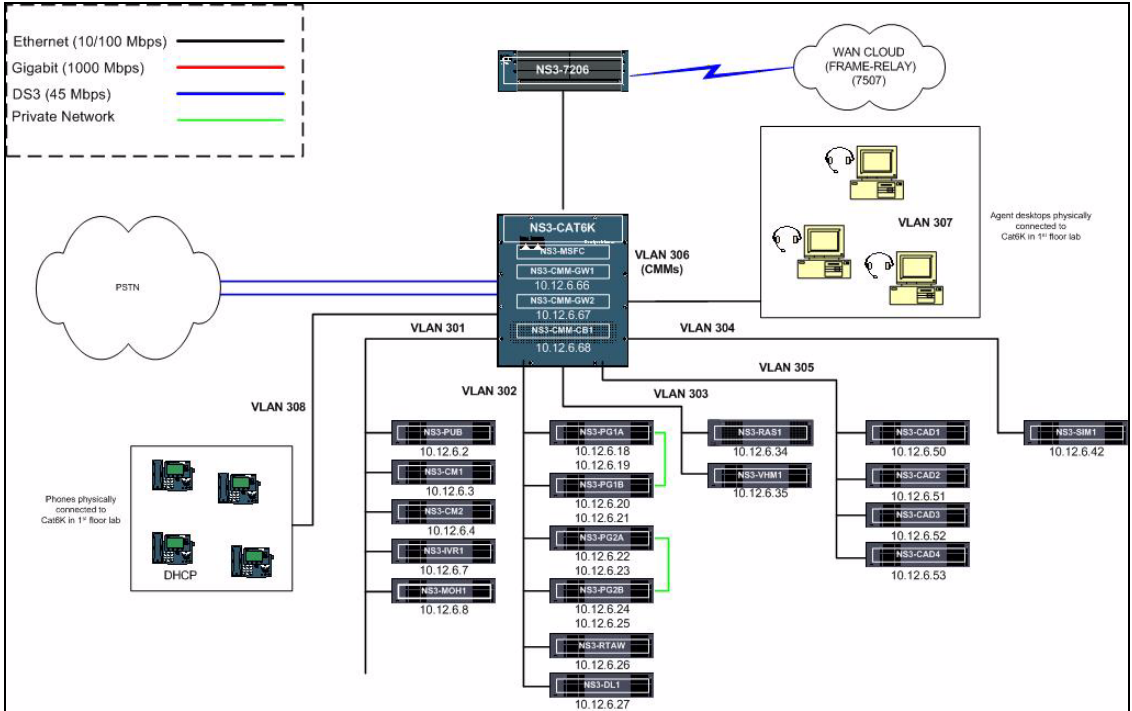
Table 2-4 Site3 Equipment List

| Component | Hardware Platform | Qty | Reference |
|------------------------------------|----------------------------------|-----|--|
| Access Switch | Catalyst 6506 | 1 | Catalyst 6500 Series, page 3-3 |
| Access Router | Cisco 7206VXR | 1 | Routers, page 3-13 |
| CAD Server | MCS-7845-1400 | 1 | CAD, page 3-2 |
| Cisco Agent and Supervisor Desktop | Pentium IV Desktop | 3 | CAD, page 3-2 |
| Cisco CallManager | MCS-7845H-3000 | 5 | Cisco CallManager, page 3-3 |
| Cisco Response Solutions (IP IVR) | MCS-7845H-2.4-EVV1 | 1 | CRS, page 3-6 |
| CMM Gateway | Catalyst 6500 | 2 | Catalyst 6500 Series, page 3-3 |
| IPCC Peripheral Gateway (PG) | MCS-7845H-2.4-CC1 | 2 | ICM, page 3-9 |
| IP Phones | Cisco IP Phones 7940/7960/ 7912G | 5 | Phones, page 3-12 |
| MR PG | MCS-7845-1400 | 2 | ICM, page 3-9 |
| Music on Hold (MOH) | MCS 7835-1266 | 1 | Cisco CallManager, page 3-3 |
| RT AW / HDS / WebView | MCS-7845-1400 | 1 | ICM, page 3-9 |
| VoIP Monitor | MCS-7845-1400 | 1 | CAD, page 3-2 |
| Outbound Option Dialer | MCS-7845-1400 | 1 | ICM, page 3-9 |

Tested Site Definitions

Figure 2-7 shows the physical topology of the medium site displaying the equipment listed in Table 2-4.

Figure 2-7 Site3 Physical Topology



Site4: Data Center Site

Site Characteristics

Site4 is the hub and a data center in a Multi-Site Centralized configuration along with Site5 and Site6. It participates in the Multi-site WAN Distributed configuration.

The test site is deployed as follows:

- Agents:
 - 406 agents use Cisco Agent Desktop (CAD) Application for call control functions.
 - Calls arriving at this site have a BHCA of 6,687.
- Call Flows:
 - ISN is used to terminate ISN Post-Routed traffic from the PSTN. ISN Post-Routed traffic arriving at Site4 is handled by agents at Site4, Site5 and Site6.
 - VRU (Gateway) is used for call treatment and queueing, and is the queue point.



Note There is no CCM Post-Routed traffic coming into this site.

- Call Processing/Routing:
 - The ICM Rogger (Side B) is located at this hub. There is a dedicated private and separate visible WAN connection to the other ICM Rogger (Side A) in Site1.
 - HDS is installed on RT AWs.
- Infrastructure:
 - Two GKs are implemented in an HSRP-cluster backup model.
 - The IPCC PG, which is used to interface with the peripherals, has two PIMs (CCM and CRS), CTI Server, and CTI OS Server co-resident on it.
 - A WAN router provides connectivity to other sites through a Frame Relay cloud.

- ISN (in comprehensive mode) is implemented with Application Server and Voice Browser functionality.
- A DHCP Server (on the router) provides IP addresses to the IP phones at the site.
- VoIP Monitor Servers are used by supervisors to perform ad-hoc monitoring of calls to agents.
- CAD (RASCAL) servers are used to control the CAD Agent Desktop Application used by agents at this site.
- The HTTP Media Server stores the media files used by the ISN for playing customer prompts.
- Network Management:
 - Perfmon and Alarm Tracker are used for network reporting.
- Redundancy and Failover:
 - For the Cisco CallManager cluster, there are 1 Publisher/TFTP and 2 Subscribers in a 1:1 load-sharing mode.
 - A Content Switch is used for load-balancing the ISN Gateway/Voice Browser Client, ISN Application Server, and the HTTP Media Server.
 - Failover capabilities are in place for the Cisco CallManager and the IPCC PG.
 - Redundancy for the Rogger is in place with the other Rogger located in Site1.
 - Gatekeepers are implemented in an HSRP redundancy model.
- Security:
 - CSA is implemented on ICM, ISN, and Cisco CallManager.
 - All traffic from Site4 to Site7 is encrypted.

Figure 2-8 is a logical topology of the medium hub site.

Figure 2-8 Site4 Logical Topology

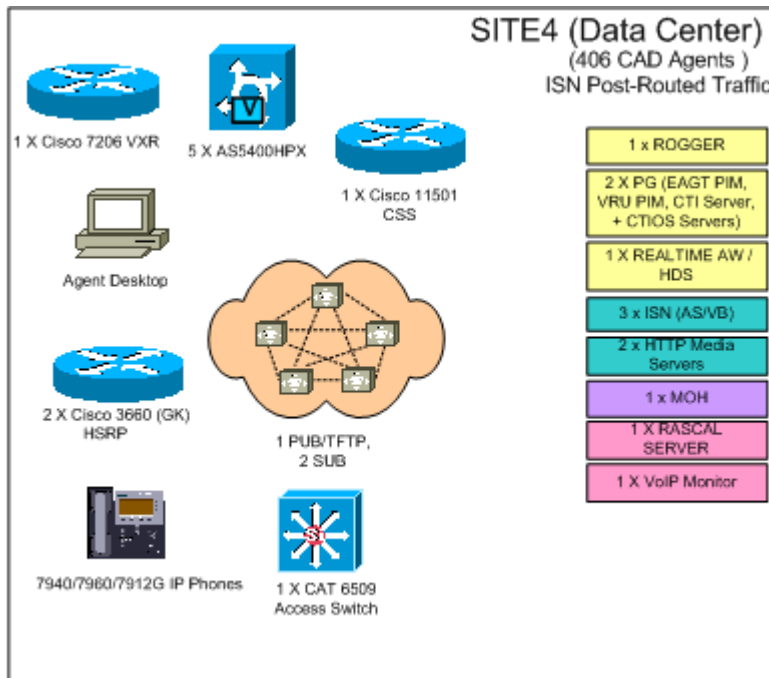


Table 2-5 lists the equipment and hardware platforms used in the medium hub site. Use the reference information in the table to access corresponding software versions and model numbers.

Table 2-5 Site4 Equipment List

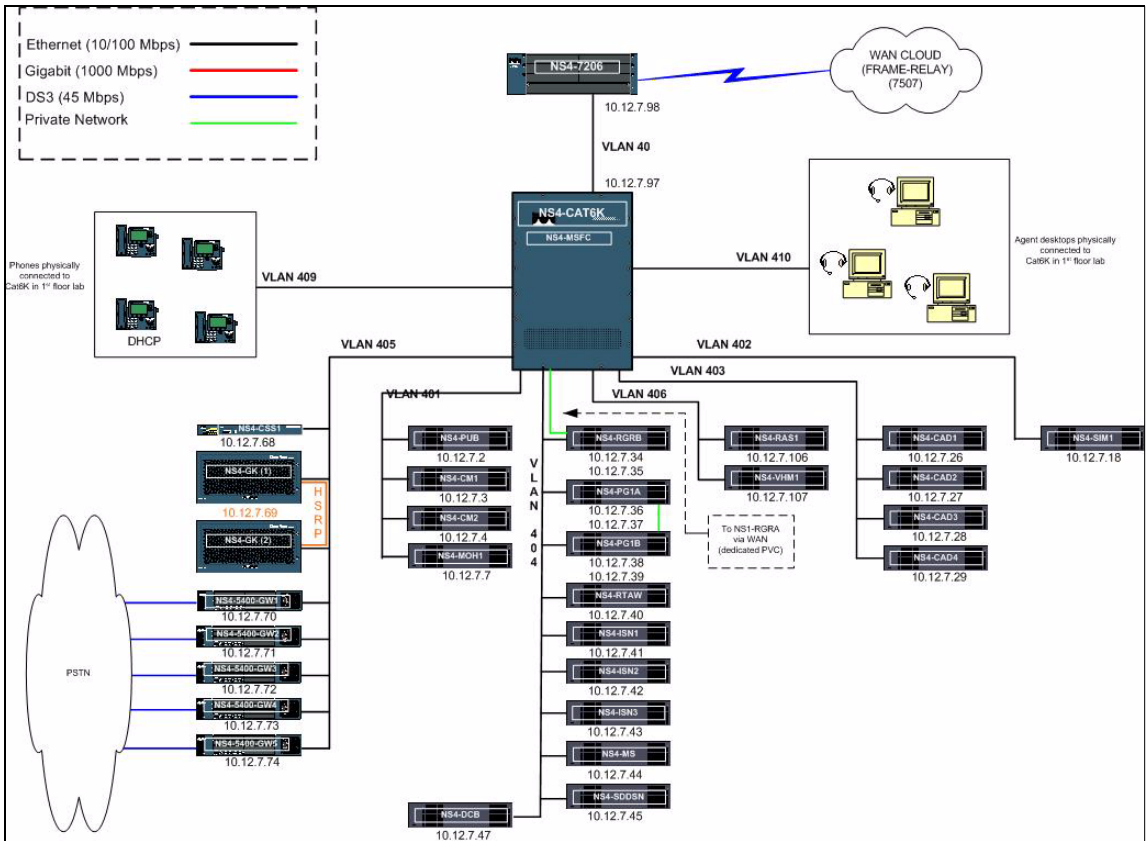
| Component | Hardware Platform | Qty | Reference |
|--------------------|-------------------|-----|--|
| Access/Core Switch | Catalyst 6509 | 1 | Catalyst 6500 Series, page 3-3 |
| Access Router | Cisco 7206VXR | 1 | Routers, page 3-13 |

Table 2-5 Site4 Equipment List (continued)

| | | | |
|--|-----------------------------------|----|--------------------------------|
| CAD Server | MCS-7845-1400 | 1 | CAD, page 3-2 |
| Cisco CallManager | MCS-7845H-3000 | 3 | Cisco CallManager, page 3-3 |
| Cisco Agent and Supervisor Desktop | Pentium IV Desktop | 3 | CAD, page 3-2 |
| Content Switch | CSS 11501 | 1 | Content Switch, page 3-5 |
| Domain Controller | MCS-7845H-2.4-EVV1 | 1 | ICM, page 3-9 |
| Gatekeeper | Cisco 3660 | 2 | Gateways/Gatekeepers, page 3-8 |
| HTTP Media Server | MCS-7835-1266 | 2 | ISN, page 3-11 |
| IPCC Peripheral Gateway (PG) | MCS-7845H-2.4-CC1 | 2 | ICM, page 3-9 |
| IP Phones | Cisco IP Phones 7940/7960/7912G | 10 | Phones, page 3-12 |
| Internet Service Node (ISN) / Voice Browser / Application Server | MCS-7845H-2.4-CC1 | 3 | ISN, page 3-11 |
| ISN Gateway (VXML) | AS5400HPX | 5 | Gateways/Gatekeepers, page 3-8 |
| Music on Hold (MOH) | MCS-7835-1266 | 1 | Cisco CallManager, page 3-3 |
| Rogger | MCS-7845H-3000 (no battery cache) | 1 | ICM, page 3-9 |
| RT AW / HDS / WebView | MCS-7845-1400 | 1 | ICM, page 3-9 |
| VoIP Monitor | MCS-7835-1266 | 1 | CAD, page 3-2 |

Figure 2-9 shows the physical topology of the medium hub site displaying the equipment listed in Table 2-5.

Figure 2-9 Site4 Physical Topology



Site5: Remote Site

Site Characteristics

Site5 is a medium-sized remote office of Site4 which is the hub in a Multi-Site Centralized configuration. It participates in the Multi-site Distributed WAN configuration.

The test site is deployed as follows:

- Agents:
 - 81 agents use Cisco Agent Desktop (CAD) Application for call control functions.
 - Calls arriving at this site have a BHCA of 487.
- Call Flows:
 - Gateways (VXML) are used to terminate the ISN Post-Routed traffic.
- Infrastructure:
 - The Gateway (Voice Browser Client) uses Media Resource Control Protocol (MRCP) to communicate with the ASR/TTS servers located in this site.
 - A WAN router provides connectivity to other sites through a Frame Relay cloud.
 - VoIP Monitor Servers are used by supervisors to perform ad-hoc monitoring of calls to agents.
 - A DHCP Server (on the router) provides IP addresses to the IP phones at the site.

Figure 2-10 shows the logical topology of the medium remote site associated with Site4.

Figure 2-10 Site5 Logical Topology

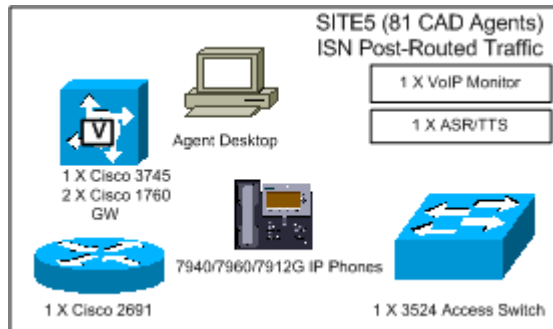


Table 2-6 lists the equipment and hardware platforms used in the medium remote site. Use the reference information in the table to access corresponding software versions and model numbers.

Table 2-6 Site5 Equipment List

| Component | Hardware Platform | Qty | Reference |
|------------------------------------|---------------------------------|-----|--|
| Access Router | Cisco 2691 | 1 | Routers, page 3-13 |
| Access Switch | Catalyst 3524 | 1 | Catalyst 3500 Series, page 3-2 |
| Cisco Agent and Supervisor Desktop | Pentium IV Desktop | 2 | CAD, page 3-2 |
| Domain Controller | MCS-7845H-2.4-EVV1 | 1 | ICM, page 3-9 |
| Gateway (VXML) | Cisco 1760 | 2 | Gateways/Gatekeepers, page 3-8 |
| Gateway (VXML) | Cisco 3745 | 1 | Gateways/Gatekeepers, page 3-8 |
| IP Phones | Cisco IP Phones 7960/7940/7912G | 5 | Phones, page 3-12 |

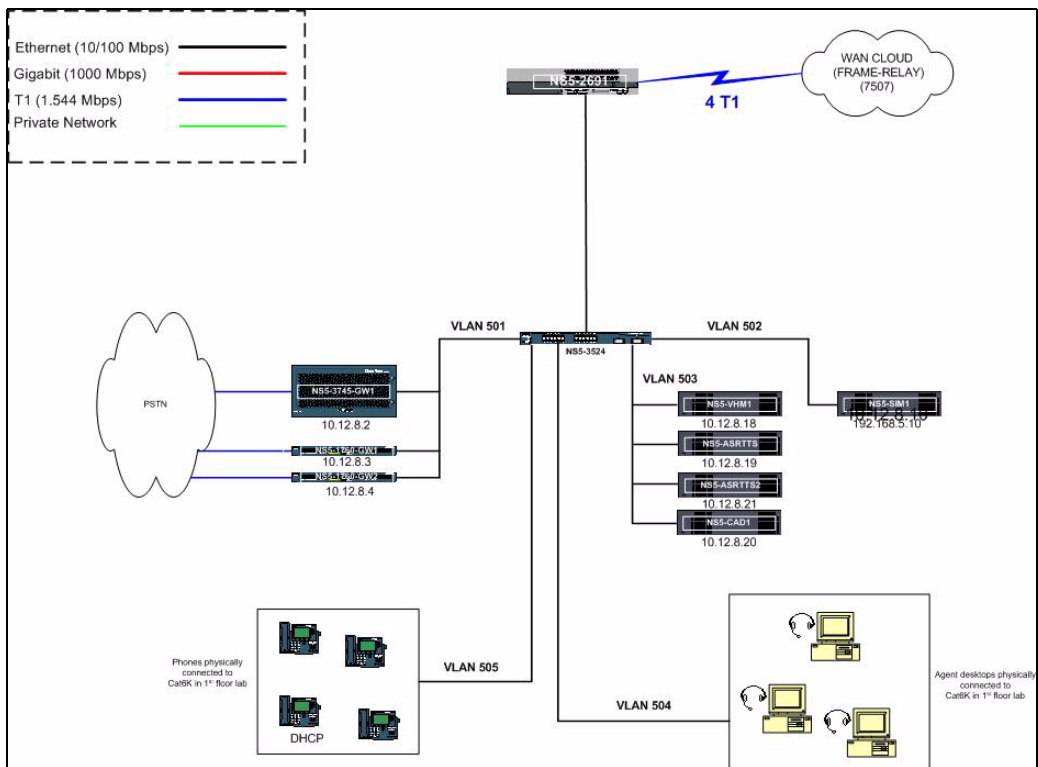
Tested Site Definitions

Table 2-6 Site5 Equipment List (continued)

| Component | Hardware Platform | Qty | Reference |
|------------------|--------------------|-----|--------------------------------|
| OSR/OSMS Server | MCS-7845H-2.4-EVV1 | 1 | ISN, page 3-11 |
| Speechify Server | MCS-7845H-2.4-EVV1 | 1 | ISN, page 3-11 |
| VoIP Monitor | MCS-7835-1266 | 1 | CAD, page 3-2 |

Figure 2-11 shows the physical topology of the medium remote site displaying the equipment listed in Table 2-6.

Figure 2-11 Site5 Physical Topology



Site6: Remote Site

Site Characteristics

Site6 is a small remote office of Site4 which is the hub in a Multi-Site Centralized configuration. It participates in the Multi-site WAN Distributed configuration.

The test site is deployed as follows:

- Agents:
 - 33 agents use Cisco Agent Desktop (CAD) Application for call control functions.
 - Calls arriving at this site have a BHCA of 487.
- Call Flows:
 - Agents from other sites do not transfer or conference calls to agents in Site6.
 - Gateways (VXML) are used to terminate the ISN Post-Routed traffic.
- Infrastructure:
 - A WAN router provides connectivity to other sites through a Frame Relay cloud.
 - A DHCP Server (on the router) provides IP addresses to the IP phones at the site.

Figure 2-12 shows the logical topology of the small remote site associated with Site4.

Figure 2-12 Site6 Logical Topology

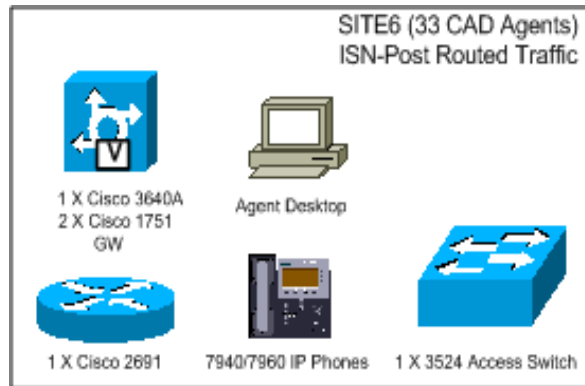


Table 2-7 lists the equipment and hardware platforms used in the small remote site. Use the reference information in the table to access corresponding software versions and model numbers.

Table 2-7 Site6 Equipment List

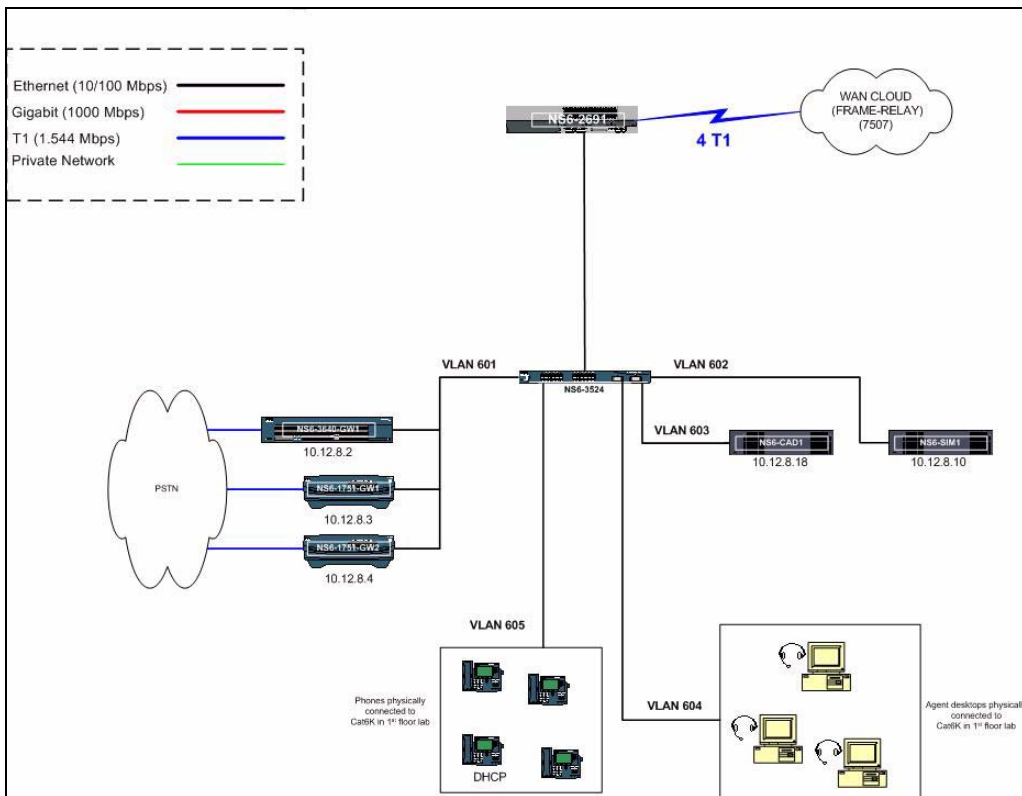
| Component | Hardware Platform | Qty | Reference |
|------------------------------------|--------------------|-----|--|
| Access Router | Cisco 2691 | 1 | Routers, page 3-13 |
| Access Switch | Catalyst 3524 | 1 | Catalyst 3500 Series, page 3-2 |
| Cisco Agent and Supervisor Desktop | Pentium IV Desktop | 2 | CAD, page 3-2 |
| Gateway (VXML) | Cisco 1751 | 2 | Gateways/Gatekeepers, page 3-8 |

Table 2-7 Site6 Equipment List (continued)

| Component | Hardware Platform | Qty | Reference |
|----------------|---------------------------|-----|--|
| Gateway (VXML) | Cisco 3640A | 1 | Gateways/Gatekeepers, page 3-8 |
| IP Phones | Cisco IP Phones 7960/7940 | 5 | Phones, page 3-12 |

Figure 2-13 shows the physical topology of the small remote site displaying the equipment listed in Table 2-7.

Figure 2-13 Site6 Physical Topology



Site7: Regional Office Site

Site Characteristics

Site7 is a branch office which participates in the Multi-site WAN Distributed configuration.

The test site is deployed as follows:

- Agents:
 - 220 agents use CTI OS Desktop Application for call control functions.
 - Calls arriving at this site have a BHCA of 3,183.
- Call Flows:
 - Several GWs are used to terminate ISN Post-Routed traffic from the PSTN.
 - Gateways (VXML) are used for call treatment and queueing, and is the queue point.
 - Agents from other sites neither transfer nor conference calls to agents at this site.
- Call Processing/Routing:
 - HDS is installed on RT AWs.
- Infrastructure:
 - The IPCC PG, which is used to interface with the peripherals, has two PIMs (CCM and CRS), CTI Server, and CTI OS Server co-resident on it.
 - A WAN router provides connectivity to other sites through a Frame Relay cloud.
 - ISN (in comprehensive mode) is implemented with Application Server and Voice Browser functionality.
 - The HTTP Media Server stores the media files used by the ISN for playing customer prompts.
 - A DHCP Server (on the router) provides IP addresses to the IP phones at the site.
- Network Management:
 - Perfmon and Alarm Tracker are used for network reporting.

- Redundancy and Failover:
 - For the Cisco CallManager cluster, there are 1 Publisher/TFTP and 2 Subscribers in a 1:1 load-sharing mode.
 - A Content Switch is used for load-balancing the ISN GW/Voice Browser Client and the ISN Application Server.
 - Failover capabilities are in place for Cisco CallManager and the IPCC PG.
- Security:
 - All traffic between Site7 and the two hubs (Site1 and Site4) is encrypted.
 - CSA is implemented on ICM, ISN, and Cisco CallManager.

Figure 2-14 shows the logical topology of the small branch office in the multi-site distributed configuration with Site4.

Figure 2-14 Site7 Logical Topology

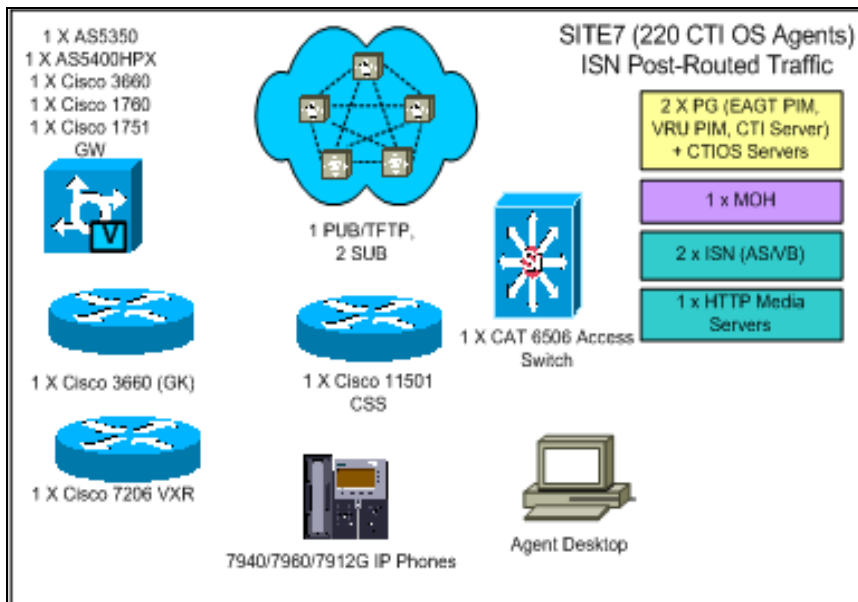


Table 2-8 lists the equipment and hardware platforms used in the small branch site. Use the reference information in the table to access corresponding software versions and model numbers.

Table 2-8 Site7 Equipment Table

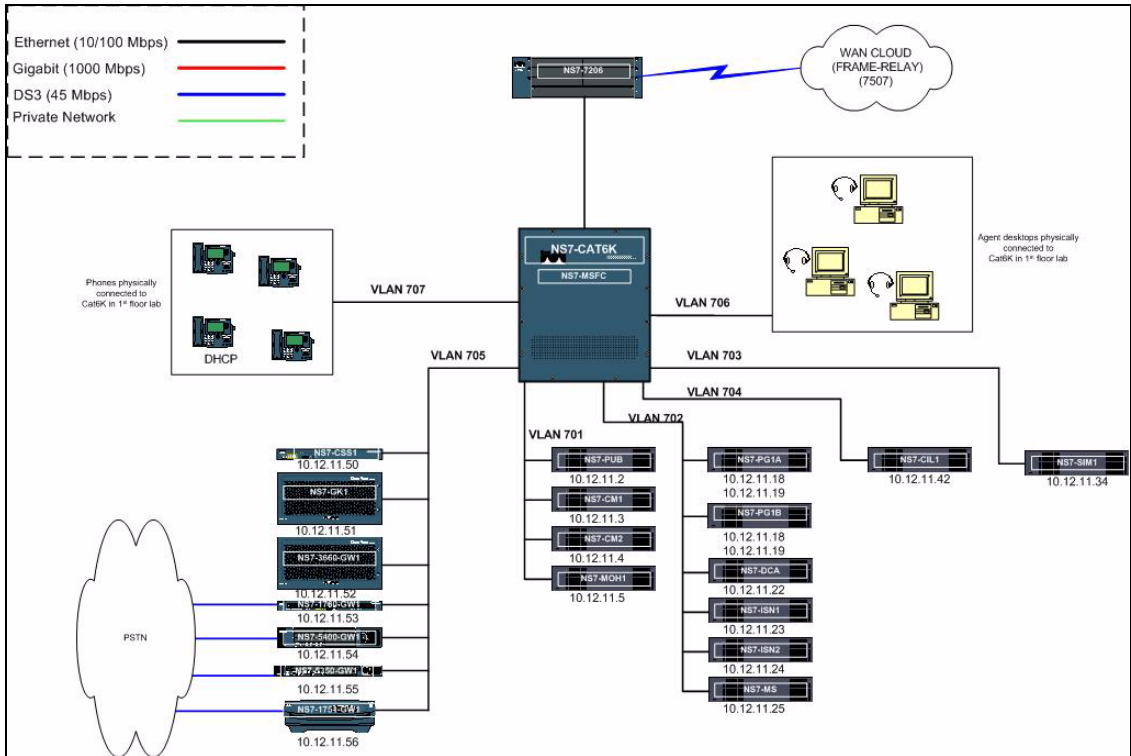
| Component | Hardware Platform | Qty | Reference |
|--|----------------------------------|-----|--|
| Access/Core Switch | Catalyst 6506 | 1 | Catalyst 6500 Series, page 3-3 |
| Access Router | Cisco 7206VXR | 1 | Routers, page 3-13 |
| Cisco CallManager | MCS-7845H-1266 | 3 | Cisco CallManager, page 3-3 |
| Content Switch | CSS 11501 | 1 | Content Switch, page 3-5 |
| CTI OS Agent and Supervisor Desktop | Pentium IV Desktop | 1 | CTI OS, page 3-7 |
| Gatekeeper | Cisco 3660 | 1 | Gateways/Gatekeepers, page 3-8 |
| HTTP Media Server | MCS-7835-1266 | 1 | ISN, page 3-11 |
| IPCC Peripheral Gateway (PG) | MCS-7845H-2.4-CC1 | 2 | ICM, page 3-9 |
| IP Phones | Cisco IP Phones 7940/7960/ 7912G | 10 | Phones, page 3-12 |
| Internet Service Node (ISN) / Voice Browser / Application Server | MCS-7845H-2.4-CC1 | 2 | ISN, page 3-11 |
| Gateway (VXML) | AS5400HPX/AS5350 | 2 | Gateways/Gatekeepers, page 3-8 |

Table 2-8 Site7 Equipment Table (continued)

| | | | |
|---------------------|-----------------------|---|--------------------------------|
| Gateway (VXML) | Cisco 1751/1760//3660 | 3 | Gateways/Gatekeepers, page 3-8 |
| Music on Hold (MOH) | MCS-7835-1266 | 1 | Cisco CallManager, page 3-3 |

Figure 2-15 shows the physical topology of the small branch office displaying all the equipment listed in Table 2-8.

Figure 2-15 Site7 Physical Topology



■ Tested Site Definitions



Components Configuration

This chapter provides information on configuring software and hardware components of the IP Communications Systems. This information includes, as appropriate: component names, related hardware platforms, and related documentation. Specific call flow configuration information for sample call flows that were tested and verified is provided in [Chapter 4, “Tested Call Flows”](#).

This chapter contains the following sections:

- [CAD, page 3-2](#)
- [Catalyst 3500 Series, page 3-2](#)
- [Catalyst 6500 Series, page 3-3](#)
- [Cisco CallManager, page 3-3](#)
- [CiscoWorks ITEM, page 3-5](#)
- [Content Switch, page 3-5](#)
- [CRS, page 3-6](#)
- [CTI OS, page 3-7](#)
- [Gateways/Gatekeepers, page 3-8](#)
- [ICM, page 3-9](#)
- [ISN, page 3-11](#)
- [Phones, page 3-12](#)
- [Routers, page 3-13](#)

**Note**

For specific information on the product software versions used, including Service Releases, Hotfixes, and Engineering Specials where applicable, refer to [Appendix A, “Release Versions of Components”](#). For configuration commands for components such as gateways, routers, switches and gatekeepers, refer to [Appendix B, “Infrastructure Components Configuration Commands”](#) and [Appendix C, “Call Flow Components Configuration Commands”](#).

CAD

Components: Cisco Agent Desktop
Cisco Supervisor Desktop
Voice over IP Monitor Server
CAD (RASCAL) Server

Hardware: Voice over IP Monitor Server and CAD (RASCAL) Server:
MCS-7845-1400
Agent and Supervisor Desktops: Pentium IV Desktop

Configuration: Install and configure Cisco Agent Desktop as described in the installation and configuration documentation.

Related documentation:

- http://www.cisco.com/en/US/products/sw/custcosw/ps427/prod_technical_documentation.html
- *Cisco Agent Desktop Installation Guide*—Guides you through the Cisco Desktop Product Suite installation process.
http://www.cisco.com/en/US/products/sw/custcosw/ps427/prod_installation_guides_list.html

Catalyst 3500 Series

Components: Cisco Catalyst 3524 (access switch)

Hardware: Cisco Catalyst 3524

Configuration: Install and configure Catalyst 3500 Series Switches as described in the Catalyst 3500 Series installation and configuration documentation.

For sample configuration files, see [Appendix B, “Infrastructure Components Configuration Commands”](#).

Related documentation:

- http://www.cisco.com/univercd/cc/td/doc/product/lan/c2900x1/29_35wc5/index.htm

Catalyst 6500 Series

Components: Cisco Catalyst 6506/6509 (access switch)
CiscoCatalyst 6506/6509 (core switch)
Cisco Catalyst 6506/6509 (MSFC)

Hardware: Cisco Catalyst 6506/6509

Configuration: Install and configure Catalyst 6500 Series Switches and its components as described in the Catalyst 6500 Series installation and configuration documentation.

For sample configuration files, see [Appendix B, “Infrastructure Components Configuration Commands”](#).

Related documentation:

- <http://www.cisco.com/univercd/cc/td/doc/product/lan/cat6000/index.htm>
- http://www.cisco.com/en/US/products/hw/switches/ps708/prod_technical_documentation.html

Cisco CallManager

Component: Cisco CallManager
Music on Hold (MOH)
Cisco Security Agent (CSA)
3rd-party Anti-Virus

Hardware: MCS-7845H-2.4-EVV1 (HPQ DL380G3, Dual CPU, 4 GB memory)
or
MCS-7835H-2.4-EVV1 (HPQ DL380G3, Single CPU, 1 GB memory)
MOH: MCS 7835-1266

Configuration: Install and configure Cisco CallManager and its components as described in the Cisco CallManager installation and configuration documentation.

Related documentation:

- http://www.cisco.com/univercd/cc/td/doc/product/voice/c_callmg/4_0/index.htm
- http://www.cisco.com/en/US/products/sw/voicesw/ps556/prod_technical_documentation.html
- *Cisco CallManager Documentation Guide for Release 4.0(2)*—Provides an overview of the available Cisco CallManager documentation.
http://www.cisco.com/univercd/cc/td/doc/product/voice/c_callmg/4_0/doc_gd/dg402.htm
- *Installing Cisco CallManager Release 4.0(2)*—Provides procedures for installing Cisco CallManager on the publisher database and subscriber servers.
http://www.cisco.com/univercd/cc/td/doc/product/voice/c_callmg/4_0/install/instcall/cm402ins.htm
- *Cisco CallManager Administration Guide, Release 4.0(1)*—Provides step-by-step instructions for configuring, maintaining, and administering the Cisco CallManager VoIP network.
http://www.cisco.com/univercd/cc/td/doc/product/voice/c_callmg/4_0/sys_ad/4_0_1/ccmcfmg/index.htm
- *Installing Cisco Security Agent for Cisco CallManager*—Provides instructions and information about installing Cisco Security Agent on Cisco CallManager.
http://www.cisco.com/en/US/products/sw/voicesw/ps556/prod_installation_guide09186a0080242186.html

CiscoWorks ITEM

Components: CiscoWorks ITEM

Hardware: MCS-7845H-2.4-EVV1

Configuration: Install and configure CiscoWorks ITEM as described in the CiscoWorks ITEM installation and configuration documentation.

Related documentation:

- <http://www.cisco.com/en/US/products/sw/cscowork/ps2433/>
- *Quick Start Guide for IP Telephony Environment Monitor 2.0*—Provides installation information for IP Telephony Environment Monitor 2.0 and other bundled components.
http://www.cisco.com/en/US/products/sw/cscowork/ps2433/products_quick_start09186a00801d6859.html#wp28713
- *Installation and Setup Guide for IP Telephony Monitor on Windows 2000*—Provides the installation and configuration information for setting up CiscoWorks IP Telephony Monitor 2.0.
http://www.cisco.com/univercd/cc/td/doc/product/rtrmgmt/cw2000/itm/itm_20/install/itmig.pdf

Content Switch

Components: Cisco CSS 11501 Content Services Switch
WebNS

Hardware: CSS 11501

Configuration: Install and configure CSS Content Switches as described in the CSS Content Switch installation and configuration documentation.

For sample configuration files related to specific call flows discussed in Chapter 4, “Tested Call Flows”, see Appendix C, “Call Flow Components Configuration Commands”.

Related documentation:

- http://www.cisco.com/en/US/products/hw/contnetw/ps789/prod_installation_guides_list.html
- http://www.cisco.com/en/US/products/hw/contnetw/ps789/prod_configuration_guides_list.html

CRS

Component: Cisco Customer Relations Solutions (CRS) (formerly CRA)
Cisco Security Agent (CSA)
3rd-party Anti-Virus

Hardware: MCS-7845H-2.4-EVV1 (HPQ DL380G3, Dual CPU, 4 GB memory)
or
MCS-7835H-2.4-EVV1 (HPQ DL380G3, Single CPU, 1 GB memory)

Configuration: Install and configure Cisco CRS and its components as described in the CRS installation and configuration documentation.

Related documentation:

- http://www.cisco.com/univercd/cc/td/doc/product/voice/sw_ap_to/apps_3_5/english/index.htm
- *Getting Started with Cisco Customer Response Applications 3.5(1)*—Overview, installation, and basic configuration information.
http://www.cisco.com/univercd/cc/td/doc/product/voice/sw_ap_to/apps_3_5/english/admn_app/g35.pdf
- *Cisco Customer Response Applications Administrator Guide 3.5(1)*—Detailed reference of the Cisco CRS Administration web interface.
http://www.cisco.com/univercd/cc/td/doc/product/voice/sw_ap_to/apps_3_5/english/admn_app/apadm35.pdf
- *Cisco CRS Serviceability Guide*—Instructions for configuring and using tools to monitor, discover, and troubleshoot Cisco CRS and its installed components, subsystems, and services.
http://www.cisco.com/univercd/cc/td/doc/product/voice/sw_ap_to/apps_3_1/english/admn_app/service/serv.pdf

- *Installing Cisco Security Agent for Cisco Customer Response Solutions*—Provides installation instructions and information for CSA for Cisco CRS if it resides on the same server as Cisco CallManager.
http://www.cisco.com/univercd/cc/td/doc/product/voice/sw_ap_to/apps_3_5/english/admn_app/csacrs.pdf

CTI OS

Components: Cisco Telephony Integration Option (CTI OS) Client

Hardware: Stand-alone CTI OS servers are not being used in this test environment

Agent and Supervisor Desktops: Pentium IV Desktop

Configuration: Install and configure CTI OS and its Supervisor and Agent Desktops as described in the installation and configuration documentation.

Related documentation:

- <http://www.cisco.com/univercd/cc/td/doc/product/icm/icmentpr/icm60doc/icm6cti/ctios60/index.htm>
- *Cisco ICM Software Release 6.0(0) CTI OS System Manager's Guide*—Provides procedures for installing and configuring the CTI OS product.
<http://www.cisco.com/univercd/cc/td/doc/product/icm/icmentpr/icm60doc/icm6cti/ctios60/cti60mgr.pdf>
- *Cisco Intelligent Contact Management Software Release 6.0(0) Bill of Materials*—This document contains the recommended hardware and software specifications for Release 6.0(0) of Cisco ICM and IPCC Enterprise Editions, CTI Option, Outbound Option, Web Collaboration Option, and E-Mail Manager Option.
<http://www.cisco.com/univercd/cc/td/doc/product/icm/ccubom/60bom.pdf>

Gateways/Gatekeepers

Component: ISN VXML Voice Gateways: Cisco AS5350/AS5400HPX, Cisco 1751, 1760, 3640A, 3660, 3745
GUP Gatekeeper: Cisco 3660
HSRP Gatekeeper: Cisco 3660
Cisco Catalyst Communications Media Module (CMM)

Hardware: Cisco AS5350/AS5400HPX universal gateway
Cisco 1700, 3660, and 3700 Series multi-service access platforms
Cisco Catalyst 6000 Series CMM

Configuration: Install and configure the various types of Cisco Gateways as described in the installation and configuration documentation.

For sample configuration files, see [Appendix B, “Infrastructure Components Configuration Commands”](#).

For sample configuration files related to specific call flows discussed in [Chapter 4, “Tested Call Flows”](#), see [Appendix C, “Call Flow Components Configuration Commands”](#).

Related documentation:

- <http://www.cisco.com/univercd/cc/td/doc/product/software/ios123/123relnt/xprn123/index.htm>
- <http://www.cisco.com/univercd/cc/td/doc/product/software/ios123/index.htm>
- http://www.cisco.com/univercd/cc/td/doc/product/access/acs_mod/1700/index.htm
- http://www.cisco.com/univercd/cc/td/doc/product/access/acs_mod/cis3600/index.htm
- http://www.cisco.com/univercd/cc/td/doc/product/access/acs_mod/cis3700/index.htm
- http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/index.htm

ICM

Components: Cisco Intelligent Contact Management

Cisco IP Contact Center (IPCC) Enterprise Edition
Windows 3000 Domain Controller for ICM Active Directory Forest
Rogger (Router and Logger)
Peripheral Gateway (PG)
Media Routing PG (MR PG)
CTI Server
Real-Time Admin Workstation (RT AW)
Historical Data Server (HDS)
WebView
Outbound Option (formerly Blended Agent)
Outbound Option Dialer (formerly Campaign Dialer)
Campaign Manager (on Rogger Server)
Cisco Security Agent (CSA)
Alarm Tracker
3rd-party Anti-Virus

Hardware: IPCC PG: MCS-7845H-2.4-CC1 (HPQ DL380G3, Dual CPU, 4 GB memory)
HDS/Web View/Admin Workstation: MCS 7845-1400
MR PG: MCS 7845-1400
OutBound Option (BA Dialer): MCS 7845-1400

Configuration: Install and configure ICM/IPCC and its components as described in the installation and configuration documentation.

Related documentation:

- <http://www.cisco.com/univercd/cc/td/doc/product/icm/icmentpr/icm60doc/index.htm>
- http://www.cisco.com/en/US/products/sw/custcosw/ps1001/prod_technical_documentation.html
- *Cisco ICM Enterprise Edition Installation Guide*—Describes how to install the components of ICM software, including information about hardware configuration and software setup.
<http://www.cisco.com/univercd/cc/td/doc/product/icm/icmentpr/icm60doc/coreicm6/plng60/icme60ig.pdf>

- *Cisco ICM Enterprise Edition Configuration Guide*—Describes how to use the ICM Configuration Manager tools to configure ICM software once it has been installed.
<http://www.cisco.com/univercd/cc/td/doc/product/icm/icmentpr/icm600c/coreicm6/config60/icme60cg.pdf>
- *Cisco IP Contact Center Enterprise Edition Installation and Configuration Guide*—Describes how to install and configure the ICM components that are used for the IPCC Enterprise solution, including information about installing the CallManager PG, VRU PG, and CTI Server.
<http://www.cisco.com/univercd/cc/td/doc/product/icm/ipccente/ipcc60d/ipccent6/ipce60ic.pdf>
- *Cisco ICM/IP Contact Center Enterprise Edition WebView Installation and Administration Guide, Release 6.0(0)*—Discusses how to install and administer WebView, how to set up users to access WebView, and installation troubleshooting tips.
<http://www.cisco.com/univercd/cc/td/doc/product/icm/icmentpr/icm600c/icm6rept/wipce60i.pdf>
- *Cisco ICM/IP Contact Center Enterprise Edition OutBound Option Setup and Configuration Guide*—Provides installation and configuration information about the ICM Outbound Option (formerly Blended Agent) application.
<http://www.cisco.com/univercd/cc/td/doc/product/icm/icmentpr/icm600c/icm6out/icme60oi.pdf>
- *Installing Cisco Security Agent for Cisco Intelligent Contact Management Software, Release 6.0(0)*—Provides installation instructions and information about Cisco Security Agent for Cisco ICM.
<http://www.cisco.com/univercd/cc/td/doc/product/icm/icmentpr/icm600c/coreicm6/config60/icme60ci.pdf>
- *Cisco Intelligent Contact Management Software Release 6.0(0) Bill of Materials*—This document contains the recommended hardware and software specifications for Release 6.0(0) of Cisco ICM and IPCC Enterprise Editions, CTI Option, Outbound Option, Web Collaboration Option, and E-Mail Manager Option.
<http://www.cisco.com/univercd/cc/td/doc/product/icm/ccubom/60bom.pdf>

- *Security Best Practices for Cisco Intelligent Contact Management Software Release 6.0(0)*—This document describes security hardening configuration guidelines for Cisco ICM software Release 6.0(0) in the Microsoft Windows 2000 Server environment.
<http://www.cisco.com/univercd/cc/td/doc/product/icm/icmentpr/icm600c/coreicm6/config60/icme60sg.pdf>

ISN

Components: Cisco Internet Service Node (ISN)
Voice Browser and Application Server (co-resident on ISN)
HTTP Media Server (see below)
ScanSoft OSR
ScanSoft OSMS
Cisco Security Agent (CSA)
3rd-party Anti-Virus

Hardware: MCS-7845H-2.4-CC1
ScanSoft ASR/TTS: MCS-7845H-2.4-EVV1
HTTP Media Server: MCS 7835-1266

Configuration: Install and configure ISN and its components as described in the installation and configuration documentation.

HTTP Media server is not actually a part of ISN, but is used by ISN. Information on installing the Media Server is not contained in the ISN documentation, though Media Server configuration information is provided.

Related documentation:

- <http://www.cisco.com/univercd/cc/td/doc/product/icm/isn/isn21/index.htm>
- http://www.cisco.com/en/US/products/sw/custcosw/ps1006/prod_technical_documentation.html
- *Cisco Internet Service Node (ISN) Installation Guide*—Describes how to install the ISN components and perform initial configuration.
<http://www.cisco.com/univercd/cc/td/doc/product/icm/isn/isn21/isninst.pdf>

- *Cisco Internet Service Node (ISN) Configuration and Administration Guide*—Describes configuration and administration of ISN components and associated ICM software, and provides troubleshooting information, as appropriate.
<http://www.cisco.com/univercd/cc/td/doc/product/icm/isn/isn21/isncfg.pdf>
- *Installing Cisco Security Agent for Cisco Internet Service Node (ISN) Software, Release 2.0(0) and 2.1(0)*—This document provides installation instructions and information about Cisco Security Agent for Cisco Internet Service Node (ISN) Software.
<http://www.cisco.com/univercd/cc/td/doc/product/icm/isn/isn20/isn20csa.pdf>

Phones

Components: Cisco IP Phone 7912G/7940/7960

Hardware: Cisco IP Phone 7912G/7940/7960

Configuration: Install and configure Cisco IP Phone 7960/7940/7912G as described in the installation and configuration documentation.

Related documentation:

- http://www.cisco.com/univercd/cc/td/doc/product/voice/c_ipphon/english/ipp7960/index.htm
- http://www.cisco.com/univercd/cc/td/doc/product/voice/c_ipphon/english/ipp7912g/index.htm
- *Cisco IP Phone Administration Guide for Cisco CallManager 4.0*—Provides the information you need to understand, install, configure, and manage the Cisco IP Phone models 7960, 7940, and 7910 on your network.
http://www.cisco.com/univercd/cc/td/doc/product/voice/c_ipphon/english/ipp7960/admin/4_0/7900a.pdf
- *Cisco IP Phone Administration Guide for Cisco CallManager 4.0*—Provides the information you need to understand, install, configure, and manage the Cisco IP Phone models 7902, 7905, and 7912 on your

network.

http://www.cisco.com/univercd/cc/td/doc/product/voice/c_ipphon/english/ipp7905g/admin/ccm40/lowp.pdf

Routers

Components: Cisco 2691/7206/7507

Hardware: Cisco 2691/7206/7507

Configuration: Install and configure routers as described in the installation and configuration documentation.

For sample configuration files, see [Appendix B, “Infrastructure Components Configuration Commands”](#).

For sample configuration files related to specific call flows discussed in [Chapter 4, “Tested Call Flows”](#), see [Appendix C, “Call Flow Components Configuration Commands”](#).

Related documentation:

- <http://www.cisco.com/univercd/cc/td/doc/product/software/ios123/index.htm>
- *Cisco IOS Release 12.3 Configuration Guides and Command References*—Documentation for tasks and commands necessary to configure and maintain access servers or routers.
<http://www.cisco.com/univercd/cc/td/doc/product/software/ios123/123cgr/index.htm>



Tested Call Flows

This chapter provides detailed description and configuration information for three different sample call flows that were tested and verified in this test environment:

- CCM Post-Routed call flow where the call arrives at Site1 but is handled by agents at Site3.
- ISN Post-Routed call flow where ISN post-routes the call to Site4 and the call is handled by agents at Site4.
- Outbound Option call flow (Blended Agent) where the call is handled by agents in Site3.

Note

The tasks listed for configuring the various components for the sample call flows are neither exhaustive, sequential, nor complete in detail. Please refer to the appropriate installation and configuration manuals for the more comprehensive information available on the configuration tasks. For configuration commands specific to the components involved in the call flows, please refer to [Appendix C, “Call Flow Components Configuration Commands”](#).

This chapter contains the following sections:

- [CCM Post-Routed Call Flow, page 4-2](#)
- [ISN Post-Routed Call Flow, page 4-23](#)
- [Outbound Option Call Flow \(Blended Agent\), page 4-40](#)

CCM Post-Routed Call Flow

Overview

Cisco CallManager takes care of the switching requirements of the IPCC system. This section describes a sample CCM Post-Routed call flow that was tested and verified. In this sample CCM Post-Routed call flow scenario, the customer call comes in first to the Cisco CallManager. The Cisco CallManager can receive the call from the PSTN network on a Cisco Voice Gateway.

The Cisco CallManager informs ICM of the new call to request routing information. ICM, using its routing logic, determines the appropriate target (agent or peripheral).

ICM then responds to the Cisco CallManager with a routing label for the appropriate target (agent or IP IVR). Cisco CallManager sends the call to the agent directly, if the agent is available, or queued in the CRS (IP IVR) until an agent in that skill group becomes available.

Description of CCM Post-Routed Call Flow

1. The call comes into the Cisco CallManager CTI route point. Cisco CallManager sends a `NEW_CALL` message to the IPCC PG.
2. The IPCC PG sends a `ROUTE_REQUEST` message to the ICM Rogger (or ICM). The Rogger executes the ICM script based on the dialed number that was part of the `ROUTE_REQUEST`. The script determines the skill group that can best answer the call and checks for agent availability.

Agent Is Available (Scenario A)

- A1. If an agent is available, ICM then:
 - Sends a `PRE_CALL` message to the IPCC PG with call context information, so that the PG can reserve the agent and wait for the call to arrive at the agent's phone.
 - Returns a `ROUTE_RESPONSE` message with a routing label to the Cisco CallManager.

- A2.** Cisco CallManager translates the digits in the label and decides whether the agent's phone is in the same Cisco CallManager cluster or in a different Cisco CallManager cluster.

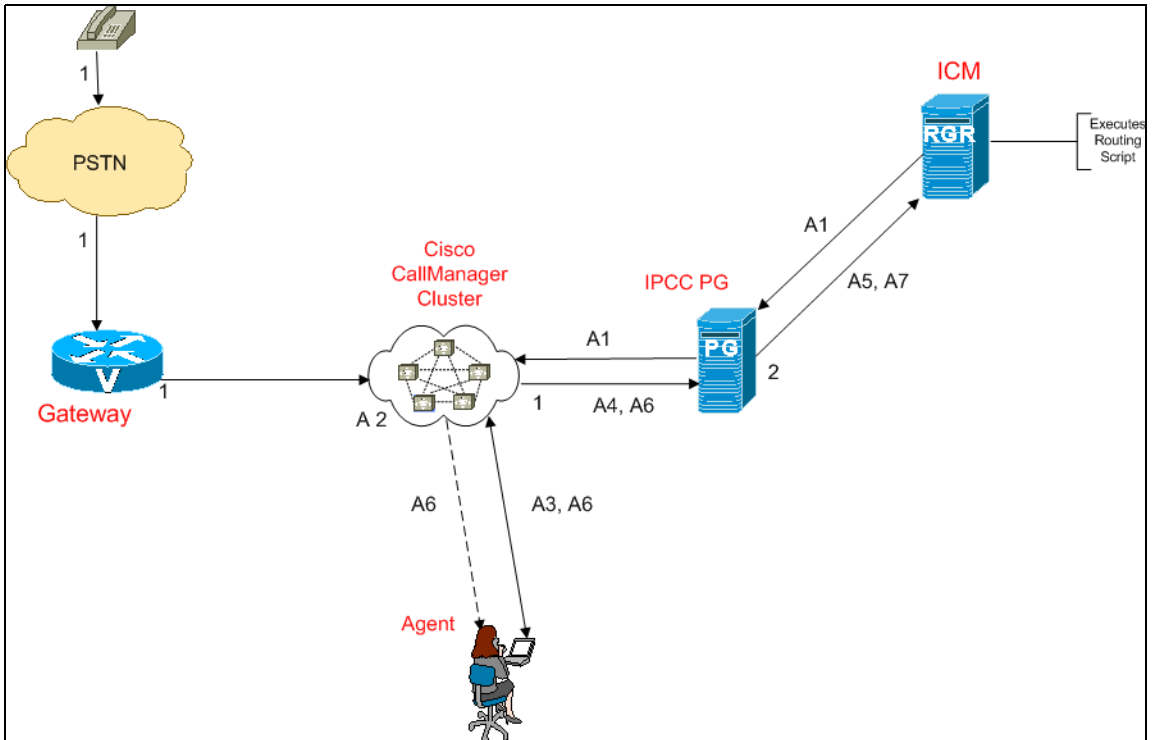


Note If the agent's phone is on a different Cisco CallManager, then the call is routed to the appropriate Cisco CallManager.

- A3.** The Cisco CallManager then rings the agent's IP phone.
- A4.** The Cisco CallManager, via the JTAPI link, sends a notification to the IPCC PG that the call has arrived.
- A5.** The IPCC PG reports to ICM that the call has arrived and is ringing on the agent's phone.
- A6.** When the agent answers the call via the IPCC Agent Desktop, JTAPI sends a MsgEstablished/CS_CONNECT message to the IPCC PG.
- A7.** The IPCC PG reports to ICM Rogger that the agent has answered the call.

Figure 4-1 shows the CCM Post-Routed call coming into Site1 from the PSTN and how the call is handled when an agent is available (Scenario A):

Figure 4-1 CCM Post-Routed Call Flow (Call Comes into Site1 and Agent is Available)



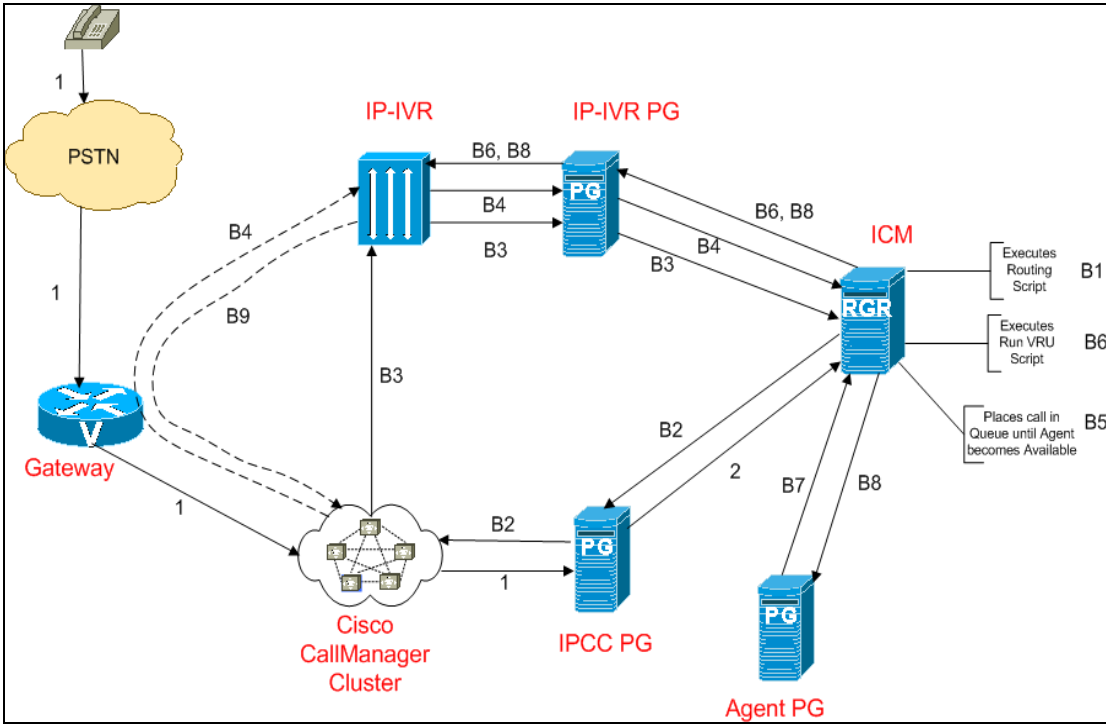
Agent Is Not Available (Scenario B)

- B1.** If an agent is not available, the ICM script then executes a Translation Route to a VRU node.
- B2.** The ICM Rogger returns a ROUTE_RESPONSE message, with a label (Translation Route DNIS), to Cisco CallManager. The label allows Cisco CallManager to route the call to the IP IVR. For IP IVR, the dialed number is a CTI route point that is owned by the IP IVR user.

On IP IVR, this CTI route point is defined as a JTAPI Trigger. IP IVR can be on the same Cisco CallManager as the call or IP IVR can be connected to a different Cisco CallManager.
- B3.** When the call arrives, the JTAPI link on Cisco CallManager informs IP IVR, which in turn informs ICM via the IP IVR PG.
- B4.** When the IP IVR PG receives the incoming call arrival message, it sends a REQUEST_INSTRUCTION message to ICM.
- B5.** ICM then places the call in an agent queue for the specific skill group and continues to look for an available agent in the skill group.
- B6.** ICM executes the Run VRU Script (Run External Script) node and returns the VRU script that the IP IVR should play for the caller, until such time an agent is available to take the call.
- B7.** Once an agent becomes available, the Agent's PG sends an AGENT_STATE_CHG message to ICM indicating that a qualified agent has become available.
- B8.** ICM then:
 - Sends PRE_CALL message to the Agent's PG with call context information, so that the PG can reserve the agent and wait for the call to arrive at the agent's phone.
 - Instructs the IP IVR to redirect the call from the agent queue to the available agent.
- B9.** The IP IVR then sends the call to the Cisco CallManager and the call is handled in the same manner as described in steps A2-A7 in [Agent Is Available \(Scenario A\)](#), page 4-2.

Figure 4-2 shows the CCM Post-Routed call coming into Site1 and how it is handled when an agent is not available (Scenario B).

Figure 4-2 CCM Post-Routed Call Flow (Call Comes into Site1 and Agent is Not Available)



CCM Post-Routed Call Flow at Specific Sites

Please note that the site-specific information described below is not represented in the graphics discussed in Figure 4-1 or Figure 4-2.

The sample CCM Post-Routed call arrives in Site1 but is handled by an agent in Site3:

1. The call comes to Site1 from the PSTN, but agents at the site are unavailable to take the call.

2. The call is queued at an IP IVR at Site1 and a recording is played back to the caller.
3. After approximately 30 seconds, ICM determines that an Agent at Site3 is available to handle the call and requests redirection of the call from Site1 IP IVR to the Site3 Agent.
4. Site3 Agent answers the call.

Configuration of Components

In this section, we discuss the procedures for configuring the various components involved in handling the CCM Post-Routed call flow including:

- Cisco CallManager
- Cisco CRS (IP IVR)
- Cisco ICM

The following is a high-level checklist of sequential tasks for Cisco CallManager configuration in an IPCC Enterprise environment:

1. Configure the agent IP Phones.
2. Configure the CTI Route Points.
3. Create JTAPI user accounts and associate them with the JTAPI phones, Route Points, and Ports.
4. Set the Phone Configuration.

**Note**

For information on installing and configuring Cisco CallManager for IPCC Enterprise, please refer to Chapter 4 in the *Cisco IP Contact Center Enterprise Edition Release 6.0(0) Installation and Configuration Guide*:
<http://www.cisco.com/univercd/cc/td/doc/product/icm/icm50/ipccfam/ipccent/ipce60ic.pdf>

Cisco CallManager Configuration

Important Reminders

Please be aware of the following as you perform the Cisco CallManager configuration tasks listed in [Table 4-1](#).

- Media connections to the CRS server are either all G.711 or all G.729, based on selections made during the CRS installation. This means that the Cisco CallManager Region configuration must allow for Devices to connect to the CRS server's CTI Ports with the appropriate codec. If not, the Transcoder channels **MUST** be configured and available.
- The Redirect activity performed by the CRS server, as a result of the ICM CONNECT_REQUEST message, uses the Call Searching Space (CSS) of the Redirected party. This CSS **MUST** be able to connect to the Agent's Device.
- Match the CTI Route Point Dialed Number entered in the CTI Route Point Configuration page with the one you enter during [ICM Software Configuration, page 4-13](#).
- Make sure to match the User configured for IP IVR to the JTAPI User configured during CRS installation.

Configuration Tasks

[Table 4-1](#) provides a list of tasks for configuring the Cisco CallManagers at Site1 and Site3 to handle and process the sample CCM Post-Routed call flow.

Table 4-1 CCM Post-Routed Call Flow: Cisco CallManager Configuration

| Using the... | Complete this Task... | In Order to... |
|----------------------------|---|---|
| Region Configuration page: | 1. Configure the appropriate Regions for the sites. | Specify the codecs to be used by calls between devices in that region and other regions. Note: Refer to Important Reminders, page 4-8 . |
| | 2. Configure the Locations for the sites. | Implement Call Admission Control (CAC) to regulate voice quality by limiting the available bandwidth for calls. |

Table 4-1 CCM Post-Routed Call Flow: Cisco CallManager Configuration

| Using the... | Complete this Task... | In Order to... |
|-------------------------------------|--|---|
| Device Pool Configuration page: | 1. Configure the Devices with the previously configured Regions. | Specify the voice codec to be used for calls in the regions with the devices. |
| | 2. Configure the Cisco CallManager Group for the Devices. | Choose the Cisco CallManager group to provide redundancy and assign to devices in this device pool. |
| Phone Configuration page: | 1. Configure the Phones with the correct Directory Numbers. | Specify an unique dialable phone number for each phone. |
| | 2. Associate the Phones with the appropriate Device Pool. | Define characteristics for devices, such as region, date/time group, failover behavior, and others. |
| CTI Route Point Configuration page: | 1. Configure the CTI Route Point name for ICM. | Specify the virtual device that post routes the call to a CTI port for ICM. |
| | 2. Match the Dialed Number here with the one you enter during ICM configuration. | Note: ICM Software Configuration, page 4-13 tasks for CCM Post-Routed call flows are listed later in this section. |
| User Information page: | 1. Configure an User for ICM JTAPI User. | Specify an user to match the JTAPI user configured during ICM PG installation. |
| | 2. Associate all Phones and CTI Route Points that were defined earlier with this User. | Provide the user with monitoring and control capabilities over the devices. |
| | 3. Enable the “Enable CTI Application Use” checkbox for the User you just configured. | Complete the process of providing device control to the user. |

Table 4-1 CCM Post-Routed Call Flow: Cisco CallManager Configuration

| Using the... | Complete this Task... | In Order to... |
|-------------------------------------|---|---|
| Gateways Configuration page: | 1. Configure the Gateways. | Receive inbound calls from the PSTN. Note: Gateways are also used to place outbound calls from the IP enterprise to the PSTN network. |
| Gatekeeper Configuration page: | 1. Configure the Gatekeeper for inter-cluster calls. | Provide effective routing in a scaled-up environment with multiple clusters. |
| | 2. Register the Cisco CallManagers in Site1 and Site3 to the Gatekeeper in Site1. | Enable the specific Cisco CallManagers to use the gatekeepers for inter-cluster routing. |
| Trunk Configuration page: | 1. Configure the Gatekeeper-controlled ICT Trunk for inter-cluster calls. | Provide effective routing in a scaled-up environment with multiple clusters. |
| | 2. Associate the ICT Trunk to the Gatekeeper defined earlier. | Enable the ICT Trunk to communicate with the Gatekeeper. |
| Route Group Configuration page: | 1. Configure the Route Group to use the ICT Trunk defined in the previous task. | Provide effective routing in a scaled-up environment with multiple clusters. |
| | 2. Associate the Route Group to the appropriate Route Pattern for making inter-cluster calls. | Enable the Cisco CallManager to route inter-cluster calls to the Gatekeeper. |
| Phone Configuration page: | 1. Define the CTI Ports for IP IVR. | Allow access to post-routing capabilities of the IP IVR. |
| CTI Route Point Configuration page: | 1. Define the CTI Route Points for IP IVR. | Provide the Translation Route DNIS numbers which ICM uses to route the calls to the IP IVR. |

Table 4-1 CCM Post-Routed Call Flow: Cisco CallManager Configuration

| Using the... | Complete this Task... | In Order to... |
|--|---|--|
| User Information page: | 1. Configure an User for IP IVR. | Provide an user account for IP IVR to connect with the Cisco CallManager. Note: Refer to Important Reminders, page 4-8 . |
| | 2. Associate all IP IVR CTI Route Points and Phones that were defined earlier with this User. | Enable IP IVR to control and monitor route points and CTI ports. |
| | 3. Enable the “Enable CTI Application Use” checkbox for the User you just configured | Allow JTAPI device control for the user. |
| Media Resource Group Configuration page: | 1. Configure Transcoders. | Allow devices with different audio codecs to communicate with each other. |
| | 2. Associate the Transcoders with a Media Resource Group. | Manage resources within a cluster and define logical groupings of media servers. |
| Media Resource Group Configuration page: | 1. Configure Conference Bridges. | Enable multi-party conferences by connecting multiple devices into an audio conference. |
| | 2. Associate the Conference Bridges with a Media Resource Group. | Manage resources within a cluster and define logical groupings of media servers. |

Table 4-1 CCM Post-Routed Call Flow: Cisco CallManager Configuration

| Using the... | Complete this Task... | In Order to... |
|---|---|---|
| Media Resource Group List Configuration page: | 1. Configure the Media Resource Group List. | Group the available media resource groups in logical groupings. |
| | 2. Associate the List with the two Media Resource Groups created previously for the Transcoders and Conference Bridges. | Specify a list of prioritized media resource groups. |
| Device Pool Configuration page: | 1. Associate the Media Resource Group List with the Device Pool configured previously. | Provide media resource group redundancy. |

CRS (IP IVR) Configuration

Important Reminders

Please be aware of the following as you perform the CRS configuration tasks listed in [Table 4-2](#).

- Ensure that the IP IVR script names defined here match script names defined in Network VRU Script List during the [ICM Software Configuration, page 4-13](#)
- Make sure that the JTAPI Call Control Group number matches ICM Trunk Group ID.
- When using CRS for queueing, set the ICM VRU script and the play prompt option in the CRS script to “Interruptible.”
- When configuring Translation Routing Applications and defining Triggers for them in CRS, always set the Max Session counts to a number that is greater than or equal to the number of CTI ports being used.
- Make sure that the Service Control option is selected in the General Configuration page.

Configuration Tasks

Table 4-2 provides a list of tasks for configuring the IP IVR at Site1 to handle and process the sample CCM Post-Routed call flow.

Table 4-2 CCM Post-Routed Call Flow: IP IVR Configuration

| Using the... | Complete this Task... | In Order To... |
|-------------------------------------|---|---|
| Cisco CRA Administrator Setup page: | <ol style="list-style-type: none"> 1. Configure IP IVR for ICM Translation Routing. | Map configuration information on ICM to corresponding IP IVR values. Note: Refer to Important Reminders, page 4-12 . |
| CRA Script Editor: | <ol style="list-style-type: none"> 1. Create and compile the VRU Script with the “Interruptible” checkbox turned ON. | Enable the interruption of the media file playing to a queued customer in the event an agent becomes available. Note: Refer to Important Reminders, page 4-12 . |
| Application Administration page: | <ol style="list-style-type: none"> 1. Load the compiled script into the ICM subsystem. | Enable ICM to use the compiled script for queueing. |

ICM Software Configuration

Important Reminders

Please be aware of the following as you perform the ICM software configuration tasks listed in [Table 4-3](#).

- Make sure that ICM Trunk Group ID matches the CRS JTAPI Call Control Group number.
- When using CRS for queueing, set the ICM VRU script and the play prompt option in the CRS Script to “Interruptible.”
- Match the ICM VRU Script Name with the CRS VRU Script Name.

- Match the Dialed Number specified while configuring Call Types with the number entered during the [Cisco CallManager Configuration, page 4-8](#).
- Make sure the Translation Routes being configured match the CTI Route Points entered during the [Cisco CallManager Configuration, page 4-8](#).

Configuration Tasks

[Table 4-3](#) provides a list of tasks for configuring the ICM Roggers at Site1 and Site3 to handle and process the sample CCM Post-Routed call flow.

Table 4-3 CCM Post-Routed Call Flow: ICM Configuration

| Using the... | Complete this Task.... | In Order to.... |
|--------------------------------------|--|--|
| PG Explorer: | 1. Configure one Peripheral Gateway as an IPCC PG. | Set it up as a consolidated or generic IPCC PG. |
| | 2. Add a Cisco CallManager PIM and IP IVR PIM to the PG. | Allow communications between the ICM software, the Cisco CallManager, IP IVR, and ISN. |
| | 3. Configure the routing client on the Cisco CallManager PIM. | Allow all post-routed calls to make route requests to ICM. |
| Label List dialog box: | 1. Define the Labels for each routing client. | Enable the routing client to perform the correct routing for the labels returned by ICM. |
| Device Target Explorer: | 1. Configure all the Device Targets for the sites, including remote (Site1, Site2, and Site3). | Enable ICM to locate the label that will route the call to an IPCC agent. |
| | 2. Associate the appropriate Labels defined previously to the Device Targets for the corresponding routing clients. | Enable the routing clients to use the labels to route to the correct device targets. |
| Agent Desk Settings List dialog box: | 1. Configure the appropriate Agent Desk Settings for each Skill Group. | Assign common attributes such as RONA, Wrap Up Time, etc. for agents. |

Table 4-3 CCM Post-Routed Call Flow: ICM Configuration

| Using the... | Complete this Task.... | In Order to.... |
|----------------------------|---|--|
| Skill Group Explorer: | 1. Configure the Skill Groups. | Define different skill sets that exist in a call center, such as language skills, etc. |
| | 2. Associate Agent IDS with them. | Associate agents with specific skill groups to receive ICM-routed calls. |
| | 3. Add a Route to each Skill Group. | Enable routing to each skill group via the Script Editor. |
| Service Explorer: | 1. Configure Services. | Represent the type of processing that a caller requires as a “superset” of skill groups. Create the supersets by assigning various skill groups to them. |
| | 2. Associate the appropriate Skill Groups defined previously to each Service. | Assign specific services to the skill supersets. |
| | 3. Create a Route to the Service. | Provide access to the service for incoming calls. |
| Skill Group Explorer: | 1. Reassociate the appropriate Skill Groups to the related Services. | Assign the same skill groups to the related services. |
| Call Type List dialog box: | 1. Configure the Call Types. | Identify and group incoming calls for routing script and reporting purposes. |
| | 2. Specify Dialed Numbers. | Identify the dialed numbers that belong to each call type. Note: Refer to Important Reminders, page 4-13 . |

Table 4-3 CCM Post-Routed Call Flow: ICM Configuration

| Using the... | Complete this Task.... | In Order to.... |
|--|--|---|
| Dialed Number/Script Selector List dialog box: | <ol style="list-style-type: none"> 1. Configure the Dialed Numbers that were specified previously. | Identify all the phone numbers that customers can dial to initiate contact. Dialed numbers are the CTI Route Point numbers which generate the route request to ICM. |
| Call Type List dialog box: | <ol style="list-style-type: none"> 1. Associate the Dialed Numbers configured in the previous task to the Call Types configured earlier. | Build the call types from the dialed numbers, CED, and CLID. |
| Network VRU Explorer: | <ol style="list-style-type: none"> 1. Define the IP IVR as a Type 2 VRU. | Define the translation route for a call to CRS in a routing script. |
| Network VRU Script List dialog box: | <ol style="list-style-type: none"> 1. Define the VRU Script names. | Provide unique names for specific routing scripts. Note: Refer to Important Reminders, page 4-13 . |
| | <ol style="list-style-type: none"> 2. Make the script “Interruptible.” | Enable the interruption of a script that is playing when an agent becomes available. Note: Refer to Important Reminders, page 4-13 . |
| Network Trunk Group Explorer: | <ol style="list-style-type: none"> 1. Configure the Network Trunk Group for the IP IVR. | Enable translation routing. Note: Refer to Important Reminders, page 4-13 . |
| Translation Route Explorer: | <ol style="list-style-type: none"> 1. Configure all the required Translation Routes (based on sizing information that was gathered) for the IP IVR with the correct DNIS. | Enable translation routing. Note: Refer to Important Reminders, page 4-13 . |

CCM Post-Routed Call Flow Screens

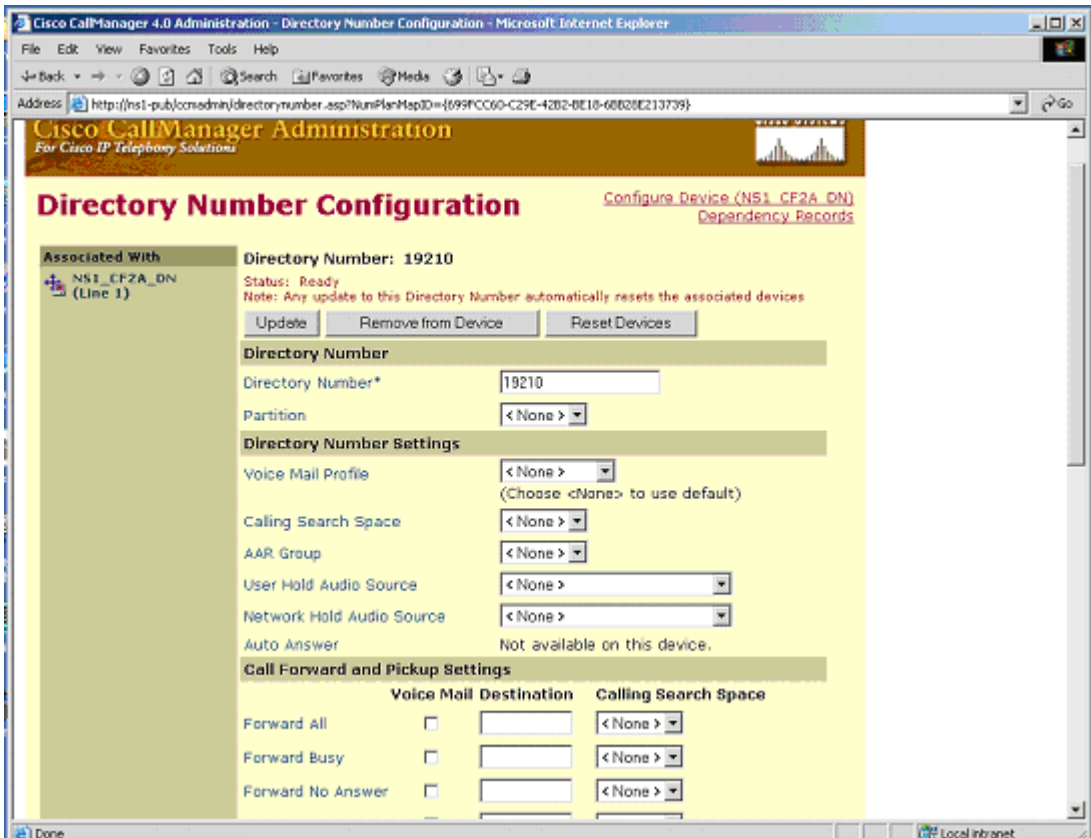
A few strategic screens have been included to provide additional perspective for configuring IPCC components for the CCM Post-Routed call flow.

- Cisco CallManager Configuration:
 - CTI Route Point Configuration
- ICM Configuration:
 - Dialed Number Configuration
 - Call Type Configuration
 - ICM Routing Script
- CRS (IP IVR) Configuration:
 - CRS VRU Script

CTI Route Point Configuration

Figure 4-3 shows the configuration of the device (CTI Route Point) used by the Cisco CallManager to deliver the call to ICM. This is the first event that happens after a call arrives at the Cisco CallManager.

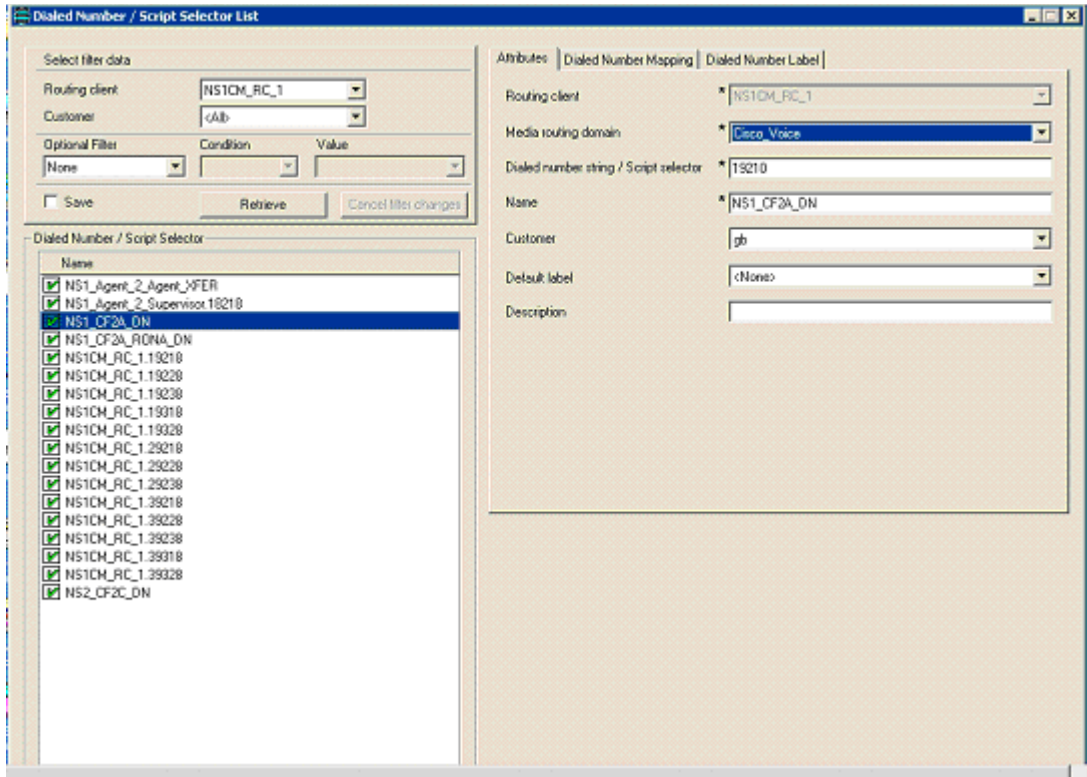
Figure 4-3 CCM Post-Routed Call Flow: CTI Route Point Configuration



Dialed Number Configuration

Figure 4-4 shows the Dialed Number definition where the Dialed Number string should be that of the CTI Route Point Directory Number as shown in Figure 4-3.

Figure 4-4 CCM Post-Routed Call Flow: Dialed Number Configuration

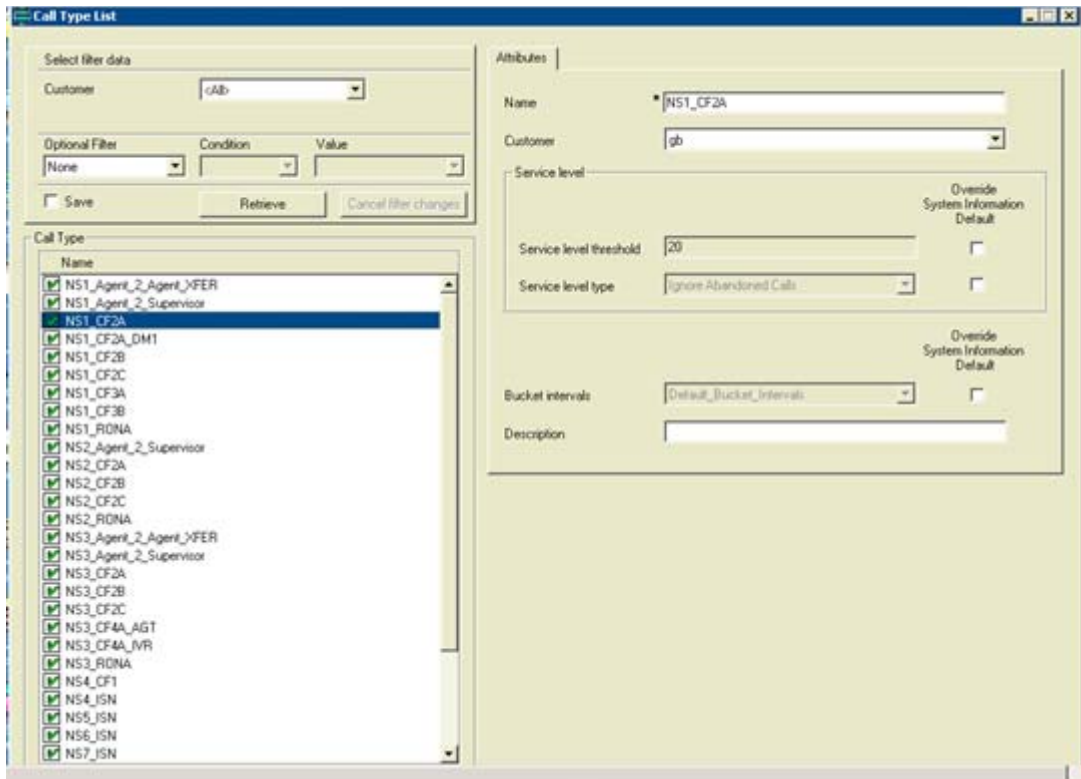


CCM Post-Routed Call Flow

Call Type Configuration

Figure 4-5 shows how the dialed number gets mapped to a call type which is eventually mapped to an ICM routing script.

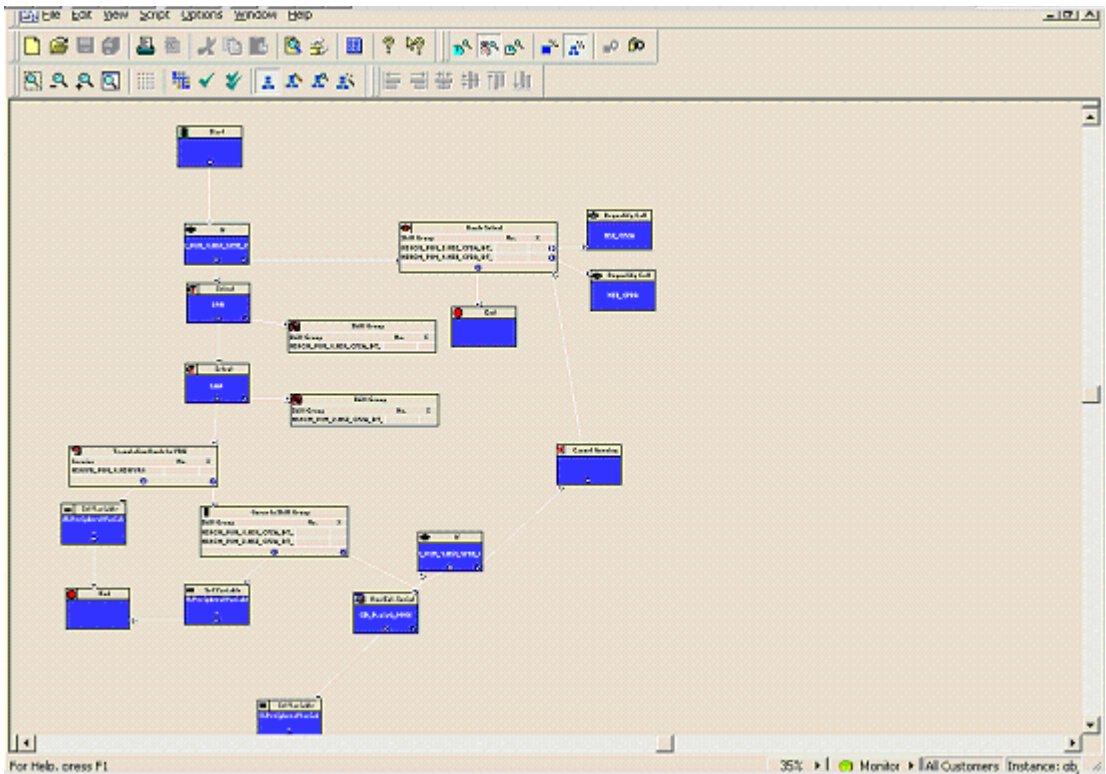
Figure 4-5 CCM Post-Routed Call Flow: Call Type Configuration



ICM Routing Script

Figure 4-6 shows the script that runs in ICM which implements the routing logic for the call and decides what happens to the call.

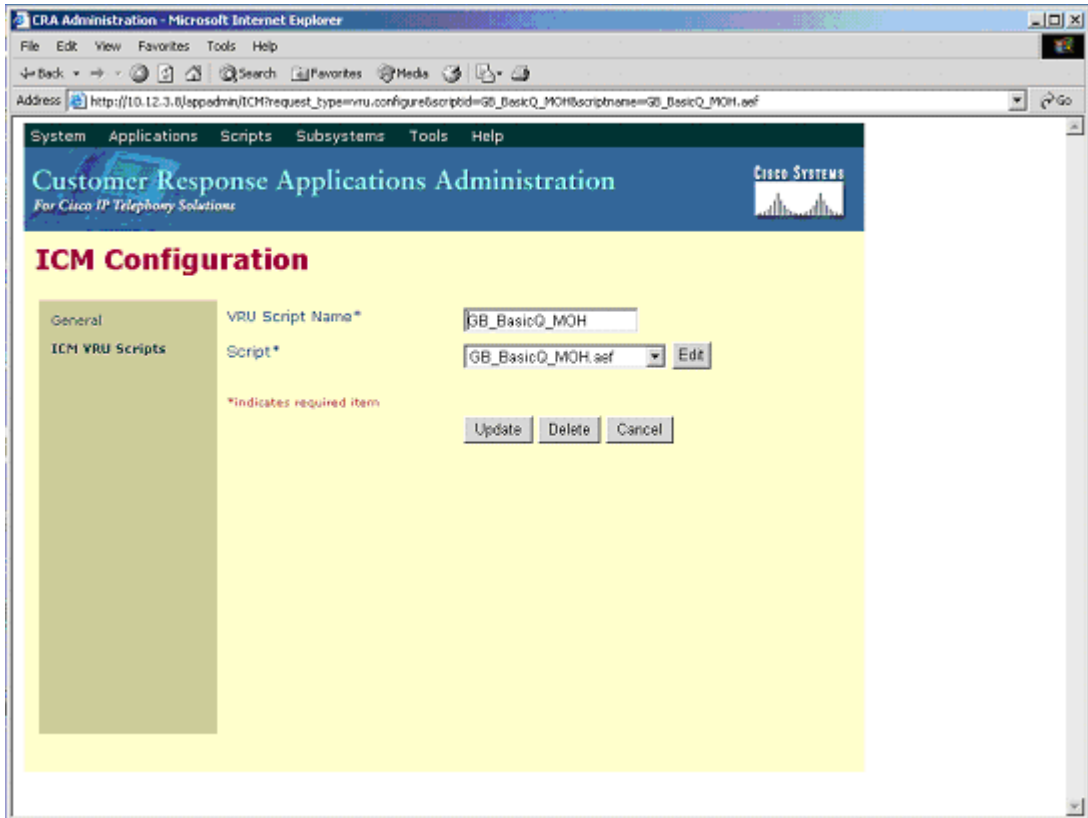
Figure 4-6 CCM Post-Routed Call Flow: ICM Routing Script



CRS VRU Script

Figure 4-7 shows the CRS VRU Script that is written using the CRA Editor and then loaded into the ICM subsystem.

Figure 4-7 CCM Post-Routed Call Flow: CRS VRU Script



ISN Post-Routed Call Flow

Overview

Cisco Internet Service Node (ISN) in the comprehensive mode is deployed to provide IVR queuing and call treatment. The ISN comprehensive model deployment involves the “ingress gateway”, the ISN Voice Browser, the ISN Application Server, an IOS Voice Browser (VXML-enabled), and the ICM components. Other involved components include the Gatekeeper, Cisco CallManager, HTTP Media Server, and a Content Server Switch (CSS).

This section describes a sample ISN Post-Routed call flow that was tested and verified in this test environment. In a typical IPCC system with ISN (comprehensive mode), there is no pre-routing of customer calls. Calls arrive immediately at the peripheral (ISN) which issues a ROUTE_REQUEST message to ICM. ICM begins its routing script and the caller can experience one of these segments:

- A segment in which the call is queued for an agent
- A segment in which the caller talks to an agent

Thereafter, the agent may transfer the call to a second agent or supervisor, which might include another queued segment if the second agent is not yet available.

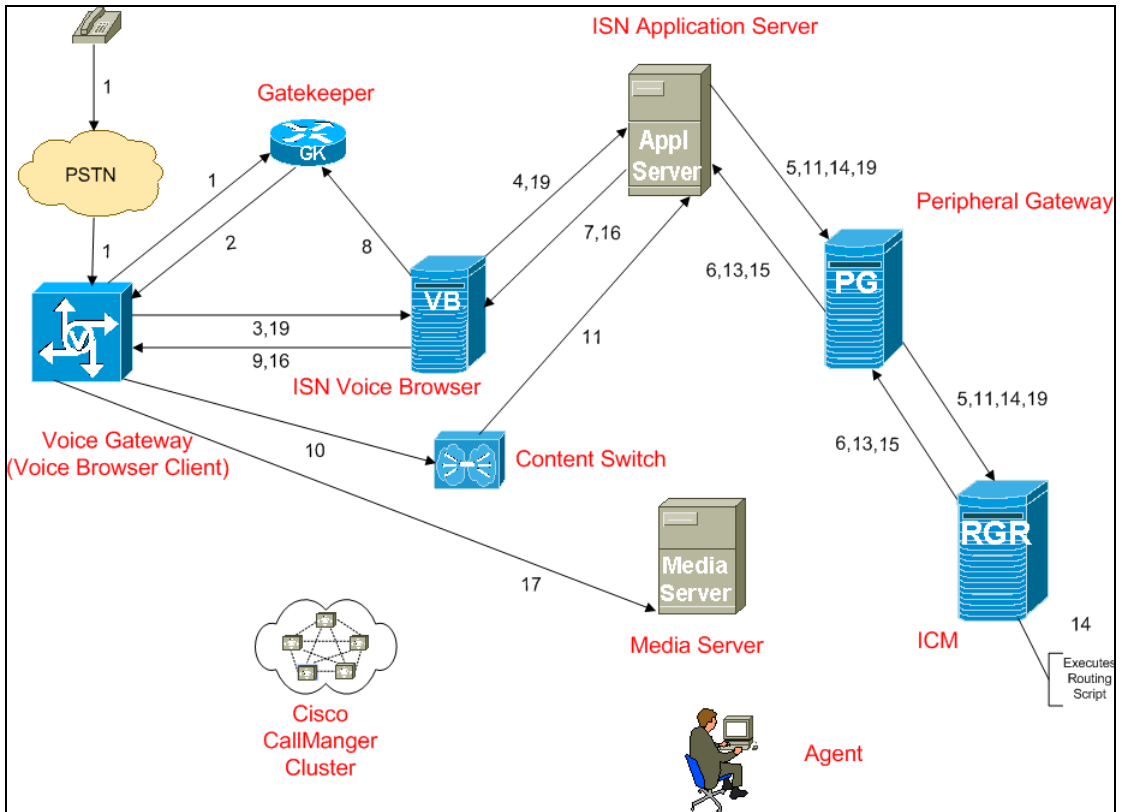
Description of ISN Call Flow

1. The call comes from the PSTN into an IOS H.323 Gateway which originates an H.323 Admission Request (ARQ) to its Gatekeeper.
2. The Gatekeeper responds with an Admission Confirm (ACF) if it knows how to route the call, and provides the IP address of the ISN Voice Browser (VB) in the ACF.
3. The Gateway routes the call using H.225 Call Setup procedures to the ISN Voice Browser.
4. The ISN Voice Browser sends the details of the call to the ISN Application Server using HTTP.

5. The ISN Application Server sends a NEW_CALL event to ICM using the ICM/VRU Interface protocol via the ISN VRU PIM.
6. ICM, upon receipt of the NEW_CALL event, sends a temporary label to connect a VRU to the ISN Application Server.
7. The ISN Application Server sends the label with a correlation ID to the ISN Voice Browser.
8. The ISN Voice Browser queries the IOS Gatekeeper for the IP address of the endpoint for that label.
9. The ISN Voice Browser initiates the IP Transfer to the VRU based on the IP address returned to it. Typically, this VRU is the originating IOS Gateway that received the call.
10. The VRU functionality of the IOS Gateway then sends a message to the Content Switch regarding the new call.
11. The Content Switch routes this message to the appropriate ISN Application Server which in turn sends a REQUEST_INSTRUCTION message to ICM.
12. ICM uses the correlation ID, which is relayed to it as a part of the REQUEST_INSTRUCTION message, with the call it processed earlier.
13. ICM, upon receipt of the REQUEST_INSTRUCTION message, also sends a CONNECT_TO_RESOURCE event back to the ISN Application Server.
14. The ISN Application Server acknowledges ICM with a RESOURCE_CONNECTED event, and then ICM executes the routing script enabled for that call.
15. Upon execution of the routing script by ICM, the ISN Application Server gets a RUN_SCRIPT_REQ event from ICM.
16. The ISN Application Server runs the script and sends instructions to the Voice Browser Client (IOS GW) via HTTP (VXML) to play the media file.
17. The Voice Browser Client sends HTTP requests to the HTTP Media Server to get the media file and then plays it out to the caller.
18. The caller is requested by the contents of the media file to respond to the prompts in the recording.
19. The Voice Browser Client detects the response or caller-entered digits (CED) and sends it to the ISN Application Server which then forwards it to ICM.

Figure 4-8 is a graphical representation of the ISN Post-Routed call flow as described up to this point (steps 1-19):

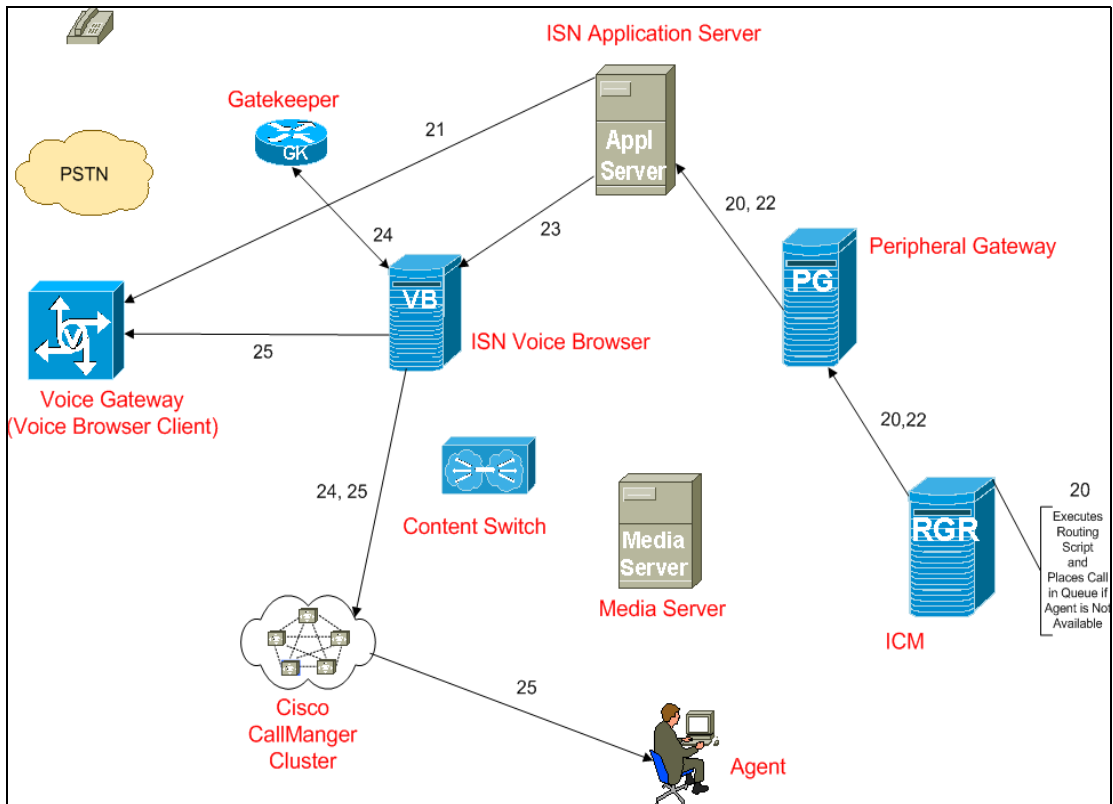
Figure 4-8 ISN Post-Routed Call Flow (Call comes into Site4 and is handled by Agent in Site4)



20. Upon receiving the digits, ICM executes the rest of its script and tries to find an agent in a skill group based on the customer's entry. If an agent is not available, it queues the call to that skill group and sends a RUN_SCRIPT_REQ to the ISN Application Server.
21. The ISN Application Server instructs the Voice Browser Client to play a hold announcement and music.
22. When an agent becomes available, ICM instructs the ISN Application Server, with a CANCEL and a CONNECT event, to stop playing the media and start setting up the IP Transfer to the agent.
23. The ISN Application Server sends a VXML Transfer to the ISN Voice Browser to start call setup to the agent.
24. The ISN Voice Browser queries the Gatekeeper via ARQ to find out where the agent is located. Upon receiving an ACF, it sends an H.225 Call Setup to the Cisco CallManager where the agent is located.
25. The ISN Voice Browser goes through several H.245 procedures to:
 - a. Open and close the appropriate logical channels with the originating IOS Gateway and the VRU.
 - b. Transfer the call to the agent phone device in Cisco CallManager.
 - c. Connect the call to the agent.

Figure 4-9 is the second graphical representation of the ISN Post-Routed call flow describing the rest of the call flow (steps 20-25).

Figure 4-9 ISN Post-Routed Call Flow (Call comes into Site4 and is handled by Agent in Site4)



ISN Post-Routed Call Flow at Specific Sites

The sample ISN Post-Routed call arrives in Site4 and is handled by an agent in the same site as described below. Note that there are three ISNs in Site4 and ISN1 is being used to handle the call flow.

1. Call comes to Site4 Gateway from the PSTN and is delivered to ISN1.
2. The Application Server at ISN1 informs ICM of the call which returns the temporary label to connect to the VRU.
3. The Voice Browser at ISN1 switches the call to the VRU (which is the Voice Browser Client at the IOS GW).
4. ICM instructs the Voice Browser Client to play a media file with menu prompts requesting the caller to enter digits.
5. Once the caller responds, ICM searches for an available agent at Site4 and delivers the call to that agent.

Configuration of Components

In this section, we discuss the procedures for configuring the various components involved in handling the ISN Post-Routed call flow including:

- Cisco ICM
- Cisco ISN

The following is a high-level sequential task list for ISN configuration in an IPCC Enterprise environment:

1. Configure the Application Server.
2. Configure the Voice Browser.
3. Set up Cisco Gateways/Gatekeepers to interact with ISN.
4. Define ISN Voice Browser as a gateway.
5. Set up Cisco ICM software to interact with ISN.


Note

For information on installing and configuring Cisco ISN for IPCC Enterprise, please refer to Chapter 8 in the *Cisco IP Contact Center Enterprise Edition Release 6.0(0) Installation and Configuration Guide*:

<http://www.cisco.com/univercd/cc/td/doc/product/icm/icm50/ipccfam/ipccent/ipce60ic.pdf>

ICM Software Configuration

Important Reminders

Please be aware of the following as you perform the ICM software configuration tasks listed in [Table 4-4](#).

- Ensure that the System Information includes correlation ID settings.
- Make sure that the ICM VRU Scripts are associated with the applicable Network VRU.
- Use the ICM Script Editor's SendToVRU node to connect the call to the Network VRU.
- Enable the Service Control Queue Reporting option so that the VRU PGs use service control.
- Make a note of the VRU Connection Port used for each VRU PG peripheral (PIM).
- When configuring a Network VRU Script/Micro-application Timeout value, either retain the default setting (180 seconds) or lengthen it to a duration longer than the longest time the script is expected to execute.
- Note that the Expanded Call Variable *user.microapp.error_code* indicates the type of failure out of the Run VRU Script node.
- Remember that the VRU Script Name and Configuration Parameter field for all five ISN Micro-applications (PM, PD, GD, M GS) are Case Sensitive.

Configuration Tasks

[Table 4-4](#) provides a list of tasks for configuring the ICM Rogger at Site4 to handle and process the sample ISN Post-Routed call flow.

Table 4-4 ISN Post Routed Call Flow: ICM Configuration

| Using the... | Complete this Task... | In Order to... |
|--|---|--|
| Network VRU Explorer: | <ol style="list-style-type: none"> 1. Configure Type 5 VRU for ISN. | Enable post-routing the call to the ISN so that it can receive the call before ICM. |
| PG Explorer: | <ol style="list-style-type: none"> 1. Configure the PGs with the appropriate number of routing clients for each ISN Application Server. | Enable the ISN Application Servers to be connected to ICM via the PG. |
| | <ol style="list-style-type: none"> 2. Use the VRU as the Network VRU in the routing client configured under PG configuration. | Make the routing client accept the inbound call from the Type 5 VRU configured in the previous task. |
| Network VRU Explorer: | <ol style="list-style-type: none"> 1. Configure Type 7 VRU. | Enable control of the VRU by the routing client. |
| | <ol style="list-style-type: none"> 2. Associate all the ISN routing clients configured previously with distinctive Labels for each client. | Enable sending the call from ICM to an ISN Voice Browser. |
| Call Type List dialog box: | <ol style="list-style-type: none"> 1. Configure the Call Types for the ISN Post-Routed call flow. | Identify and group incoming calls for routing script and reporting purposes. |
| Dialed Number/Script Selector List dialog box: | <ol style="list-style-type: none"> 1. Configure the appropriate inbound Dialed Numbers for each ISN routing client. | Identify all the phone numbers that customers can dial to initiate contact. |
| | <ol style="list-style-type: none"> 2. Associate them with their respective Call Types. | Build the call types from the dialed numbers, CED and CLID. |
| ICM Script Editor: | <ol style="list-style-type: none"> 1. Develop routing scripts for the ISN Call Types. | Provide the ultimate destination information for the incoming call. |

Table 4-4 ISN Post Routed Call Flow: ICM Configuration

| Using the... | Complete this Task... | In Order to... |
|--------------------------------------|--|--|
| Enterprise System Information tool: | 1. Change the system information and configure the default VRU to use the Type 7 VRU. | Enable the ISN as the default setting for ICM. |
| | 2. Set the adequate number of Correlation IDs (minimum/maximum). | Define the lower/upper limits of the number used by ICM to track Network VRU calls. |
| Label List dialog box: | 1. Define the Labels for each routing client. | Enable the routing client to perform the correct routing for the labels returned by ICM. |
| Device Target Explorer: | 1. Configure all the Device Targets for the site, including remote sites (Site4, Site5, Site6, and Site7). | Enable ICM to locate the label that will route the call to an IPCC agent. |
| | 2. Associate the appropriate Labels to the Device Targets for the corresponding routing clients. | Enable the routing client to use the labels to route to the correct device targets. |
| Agent Desk Settings List dialog box: | 1. Configure the appropriate Agent Desk Settings for each Skill Group. | Assign common attributes such as RONA, Wrap Up Time, etc. for agents. |
| Agent Explorer: | 1. Configure Agents and Supervisors for the sites. | Define all agents and supervisors located at the site. |
| Skill Group Explorer: | 1. Configure the Skill Groups. | Define different skill sets that exist in a call center, such as language skills, etc. |
| | 2. Associate Agent IDS with them. | Associate agents with specific skill groups to receive ICM-routed calls. |
| | 3. Add a Route to each Skill Group that you configured. | Enable routing to each skill group via the Script Editor. |

Table 4-4 ISN Post Routed Call Flow: ICM Configuration

| Using the... | Complete this Task... | In Order to... |
|-----------------------|---|--|
| Service Explorer: | 1. Configure Services. | Represent the type of processing that a caller requires as a “superset” of skill groups. Create the supersets by assigning various skill groups to them. |
| | 2. Associate each Service that was configured to appropriate Skill Groups defined in the previous task. | Assign specific services to the skill supersets. |
| | 3. Create a Route to the Service. | Provide access to the service for incoming calls. |
| Skill Group Explorer: | 1. Reassociate the appropriate Skill Groups to the related Services. | Assign the same skill groups to the related services. |

ISN Configuration

Important Reminders

Please be aware of the following as you perform the ICM software configuration tasks listed in [Table 4-5](#).

- On the ISN Application Server, make sure to set the VRU Connect Port to match the VRU Connection Port defined in the ICM configuration for the corresponding VRU PG peripheral (PIM).
- On each Voice Browser, configure the total number of calls and IVR ports according to the number of licenses purchased, call profiles, and capacity.
- Due to possible performance issues, do not set tracing on the ISN Application Server or the ISN Voice Browser unless instructed by Cisco Support.
- When creating new *.wav* files, make sure they are placed in the appropriate system folder.
- The media file types that ISN supports are Mu-Law 8-bit and A-law 8-bit *.wav* files. Recording media files in another format and converting them to the supported type may cause intermittent problems.

Configuration Tasks

Table 4-5 provides a list of tasks for configuring the ISN1 at Site4 to handle and process the sample ISN Post-Routed call flow:

Table 4-5 ISN Post-Routed Call Flow: ISN Configuration

| Using the... | Complete this Task... | In Order to... |
|---|--|--|
| IOS CLI: | <ol style="list-style-type: none"> 1. Configure the correct Zone and Dial Plan information for the Gatekeepers. | <p>Create the appropriate dial plan in the Gatekeeper.</p> <p>Note: Refer to Appendix C, “Call Flow Components Configuration Commands” for configuration commands specific to the IOS Gateway in Site4 that is involved in the ISN Post-Routed call flow.</p> |
| IOS CLI | <ol style="list-style-type: none"> 1. Configure the IOS Gateways to receive inbound calls from the PSTN. | <p>Receive inbound calls and route them appropriately.</p> <p>Note: Refer to Appendix C, “Call Flow Components Configuration Commands” for configuration commands specific to the Gatekeeper in Site4 that is involved in the ISN Post-Routed call flow.</p> |
| ISN Application Server Administration page: | <ol style="list-style-type: none"> 1. Configure the ISN Application Server. | <p>Receive inbound calls and communicate with ICM.</p> |
| Voice Browser Administration CLI: | <ol style="list-style-type: none"> 1. Configure the Voice Browser Client on the IOS gateway. | <p>Receive inbound calls and perform IP transfers.</p> <p>Note: Refer to Appendix C, “Call Flow Components Configuration Commands” for configuration commands required for the configuration discussed in this step.</p> |

Table 4-5 ISN Post-Routed Call Flow: ISN Configuration

| Using the... | Complete this Task... | In Order to... |
|--------------|---|---|
| IOS CLI | <ol style="list-style-type: none"> 1. Configure the IOS Gateway with the appropriate TCL and VXML scripts and the VRU configuration. | <p>Specify which ISN Application Server to communicate with and also provide the correct VRU treatment for the call.</p> <p>Note: Refer to Appendix C, “Call Flow Components Configuration Commands” for configuration commands required for the configuration discussed in this step.</p> |

ISN Post-Routed Call Flow Screens

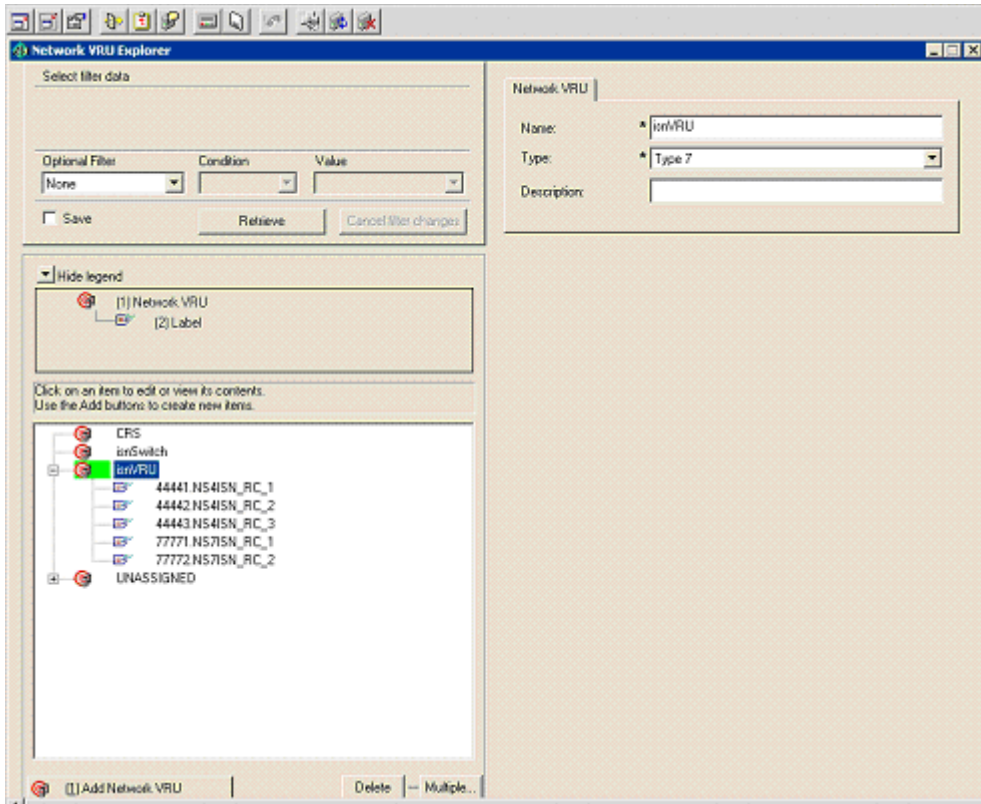
A few strategic screens have been included to provide additional perspective for configuring IPCC components for the ISN Post-Routed call flow.

- ICM Configuration:
 - Network VRU Configuration
 - Network VRU Script List Configuration
 - Dialed Number Configuration
 - Routing Script in ICM
- ISN Configuration:
 - ISN Call Definitions

Network VRU Configuration

Figure 4-10 shows how each of the ISN routing clients is configured as part of the Network VRU for the system with labels for each of the clients.

Figure 4-10 ISN Post-Routed Call Flow: Network VRU Configuration



Network VRU Script List Configuration

Figure 4-11 shows the scripts that are used in the ISN with the appropriate micro-applications.

Figure 4-11 ISN Post-Routed Call Flow: Network VRU Script List Configuration

The screenshot shows the 'Network VRU Script List' configuration window. The 'Select filter data' section has 'Network VRU' and 'Customer' both set to '<All>'. The 'Optional Filter' section is empty. The 'Network VRU Script' list contains five entries, with 'N54_ISN_welcome' selected. The 'Attributes' section for the selected script shows the following values:

| | |
|---------------------|-------------------------------------|
| Name | N54_ISN_welcome |
| Network VRU | isnVRU |
| VRU script name | M.N54_ISN_welcome |
| Timeout | 100 seconds |
| Configuration param | 1-4,10,5,5 |
| Customer | gb |
| Interruptible | <input checked="" type="checkbox"/> |
| Overridable | <input checked="" type="checkbox"/> |
| Description | |

Dialed Number Configuration

Figure 4-12 shows that the numbers being dialed by the callers are part of each of the routing clients mapped to the appropriate call types.

Figure 4-12 ISN Post-Routed Call Flow: Dialed Number Configuration

The screenshot displays the 'Dialed Number / Script Selector List' configuration window. It is divided into three main sections:

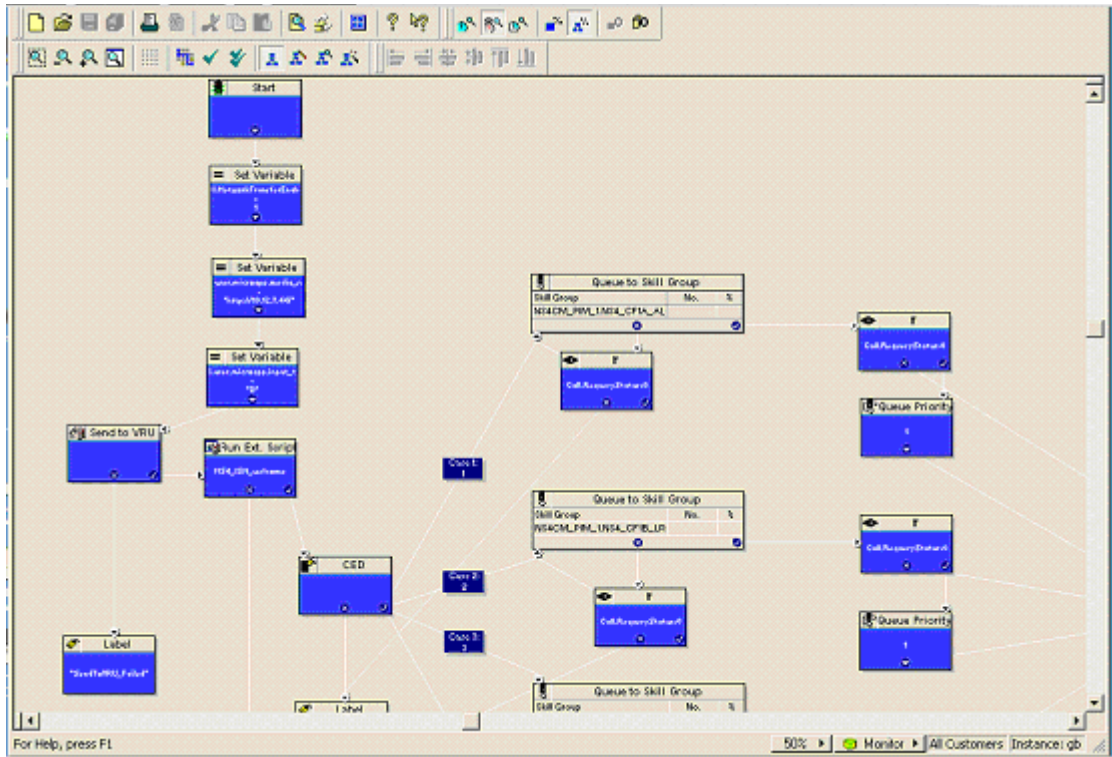
- Select filter data:** Contains dropdowns for 'Routing client' (set to 'NS4ISN_RC_1') and 'Customer' (set to '<All>'). Below these are 'Optional Filter' (set to 'None'), 'Condition', and 'Value' dropdowns. There are 'Save', 'Retrieve', and 'Cancel filter changes' buttons.
- Dialed Number / Script Selector List:** A table with a 'Name' column. It contains three entries, each with a checked checkbox:
 - NS4ISN_RC_1.49100
 - NS4ISN_RC_1.59100
 - NS4ISN_RC_1.69100
- Attributes:** A form with tabs for 'Attributes', 'Dialed Number Mapping', and 'Dialed Number Label'. The 'Attributes' tab is active, showing:
 - 'Routing client': NS4ISN_RC_1
 - 'Media routing domain': Cisco_Voice
 - 'Dialed number string / Script selector': 49100
 - 'Name': NS4ISN_RC_1.49100
 - 'Customer': gb
 - 'Default label': <None>
 - 'Description': (empty field)

ISN Post-Routed Call Flow

ICM Routing Script

Figure 4-13 shows the script that runs in ICM which implements the routing logic for the call and decides what happens to the call.

Figure 4-13 ISN Post-Routed Call Flow: ICM Routing Script



ISN Call Definitions

Figure 4-14 shows ISN call definitions that define the two groups of calls that are handled by the specific ISN Application Server. The first group is Group 100 which means it is a “New Call Type” and the second is Group 200 which means it is an “ID from ICM Type”.

Figure 4-14 ISN Post-Routed Call Flow: ISN Call Definitions

The screenshot displays the 'Application Administration' web page in Microsoft Internet Explorer. The page title is 'Application Administration' and the address bar shows 'http://isn1-isn1/appadmin/'. The main content area features a 'Call Definitions' section with a table of call groups. Below the table, there are two input fields: 'Dialed Number Maximum Length if no Correlation ID Present' with a value of 5, and 'Maximum Number Of Calls Allowed (should not exceed system ratings)' with a value of 150. An 'Update' button is located below these fields. A link to 'Main Menu' is provided at the bottom left. The footer indicates 'Internet Service Node Version 2.1.(0.74)' and 'Copyright © 2001-2003 by Cisco Systems, Inc.'.

| Group Number | Type | Initial Port | Last Port | Number of Ports |
|-----------------------|-------------|--------------|-----------|-----------------|
| 100 | New Call | 1 | 100 | 100 |
| 200 | ID from ICM | 101 | 150 | 50 |
| Total Number of Ports | | | | 150 |

Dialed Number Maximum Length if no Correlation ID Present:

Maximum Number Of Calls Allowed (should not exceed system ratings):

Click the group number to configure the DNIS number associated with the group or to modify port information.

Return to [Main Menu](#).

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Outbound Option Call Flow (Blended Agent)

Overview

Outbound Option is a feature of ICM that provides outbound dialing functionality along with existing inbound capabilities of ICM software. With Outbound Option, contact centers can be configured for automated outbound activities. Agents who are not busy handling inbound requests can perform outbound calls.

Call blending and predictive dialing offer a way to increase resource utilization and increase productivity in a contact center. Cisco Outbound Option enables contact center managers in need of outbound campaign solutions to take advantage of the enterprise view that ICM maintains over agent resources.

This section describes a sample Outbound Option Post-Routed call flow that was tested and verified in this test environment.

Description of Outbound Option Call Flow

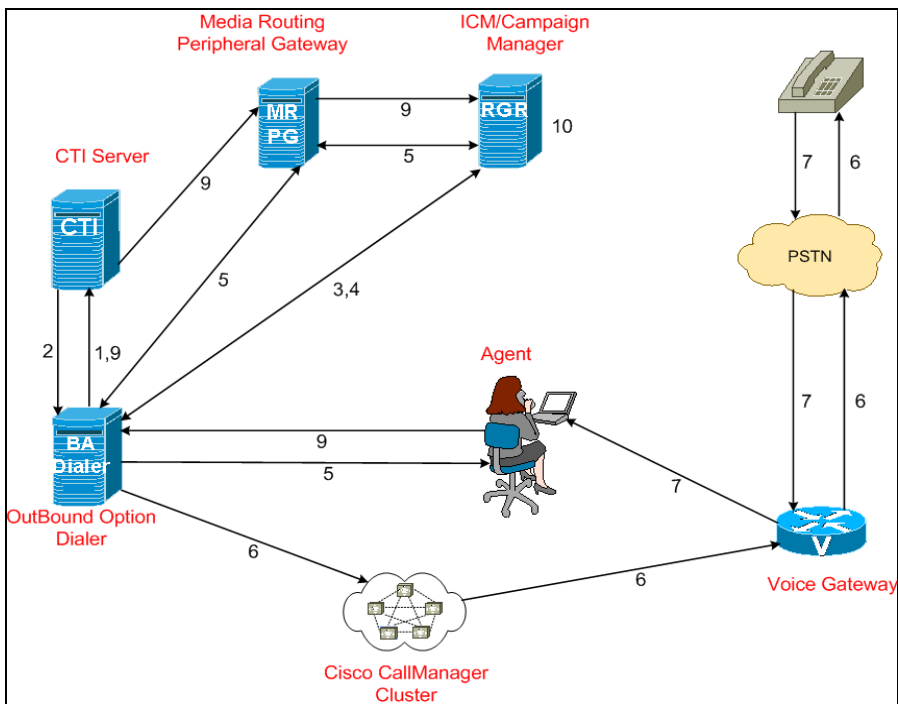
Mode: Predictive /Progressive

1. The Outbound Option (BA) Dialer requests skill group statistics from the CTI Server.
2. The CTI Server returns skill statistics from the ACD/Cisco CallManager.
3. The Outbound Option Dialer uses predictive logic to calculate the number of lines to dial and requests customer records from the Campaign Manager.
4. The Campaign Manager retrieves the required customers from its database and sends those customers to the Outbound Option Dialer.
5. The Outbound Option Dialer makes reservation requests via the MR PG interface. Once an agent is selected by the router, a physical reservation call is placed to continue to reserve the agent.
6. Once agents are reserved, the Outbound Option Dialer makes customer calls via a Cisco Voice Gateway. Call classification (that is, the result of the call: busy response, answering machine detection, etc.) is handled on the Outbound Option Dialer.

7. If a customer is contacted, they are transferred to an available agent within that skill group via the agent's call waiting line.
8. (Optional functionality provided by Cisco Client Services) When agents receive customer calls, they get an HTML-based script popup on their desktops, originating from Microsoft Active Server Pages which provides them with customer data.
9. After the customer call ends, a wrap-up code is sent to the Outbound Option Dialer which sends it to ICM via the CTI Server and the MR PG.
10. The Campaign Manager then saves call disposition information in the Logger database.

Figure 4-15 is a graphical representation of the OutBound Option call flow as described here:

Figure 4-15 Outbound Option Call Flow (Call is Handled by Blended Agents at Site3)



Outbound Option Call Flow at Specific Sites

The sample Outbound Option call is handled by an agent in Site3 as described below.

1. Customer records are imported at the Site1 Logger dynamically. A Dialing List is created.
2. During an active Campaign, the Outbound Option Dialer at Site3 makes a reservation call to a Outbound Option agent at Site3 via the MR PG.
3. The agents is set to a reserved state.
4. The Outbound Option Dialer dials out to a customer from the Dialing List via the Cisco Voice Gateway.
5. If the customer is contacted, the Outbound Option Dialer transfers the customer call to the reserved agent at Site3 within the Outbound Option skill group.
6. After the customer call ends, call disposition information is saved in the Logger database.

Configuration of Components

In this section, we discuss the procedures for configuring the various components involved in handling the OutBound Option (Blended Agent) call flow including:

- Cisco ICM
- Cisco CallManager

The following is a sequential list of high-level tasks for Outbound Option configuration in an IPCC Enterprise environment:

1. Configure ICM for Outbound Option.
2. Configure Cisco CallManager for Outbound Option.
3. Configure routing and administration scripts.


Note

For information on installing and configuring Outbound Option for IPCC Enterprise, please refer to Chapter 7 in the *Cisco IP Contact Center Enterprise Edition Release 6.0(0) Installation and Configuration Guide*:

<http://www.cisco.com/univercd/cc/td/doc/product/icm/icm50/ipccfam/ipccent/ipce60ic.pdf>

ICM Software Configuration

Important Reminders

Please be aware of the following as you perform the ICM software configuration tasks listed in [Table 4-6](#).

- Associate the Outbound Option with the Cisco CallManager PG or IPCC PG and NOT with the MR PG.
- When defining the MR PG, make sure to use the same Network VRU that was defined when setting up the [CCM Post-Routed Call Flow, page 4-2](#)
- Export the defined range of Dialer ports into a file and then import the file into Cisco CallManager using the Bulk Administration Tool (BAT).
- Since Outbound Option uses Dialed Numbers to run routing scripts, ensure that the appropriate Dialed Numbers are created and associated with the MR PG.
- Match the Dialed Numbers configured using the Call Type List configuration Page with those entered during the [Cisco CallManager Configuration, page 4-47](#).
- Create an Admin script to assign a dialing mode to the outbound/blended skill groups.
- Create a Routing script to enable Outbound Option to reserve “blended” agents.
- Make sure the dialing times specified in the Campaign configuration tool and System Options tool encompass the complete and actual dialing time period.

Configuration Tasks

Table 4-6 provides a list of tasks for configuring the ICM Rogger at Site3 to handle and process the sample Outbound Option call flow:

Table 4-6 Outbound Option Call Flow: ICM Configuration

| Using the... | Complete this Task... | In Order to... |
|--------------------------------------|---|---|
| PG Explorer: | 1. Create an IPCC Peripheral Gateway. | Set it up as a consolidated or generic IPCC PG. |
| | 2. Create a Media Routing Peripheral Gateway (MR PG). | Allow control of the Outbound Option Dialer for outbound calls. Note: Refer to Important Reminders, page 4-43 . |
| Label List dialog box: | 1. Define the Labels for each routing client. | Enable the routing client to perform the correct routing for the labels returned by ICM. |
| Device Target Explorer: | 1. Configure all the Device Targets for this site. | Enable ICM to locate the label that will route the call to an IPCC agent. |
| | 2. Associate the Labels defined previously to the Device Targets for the corresponding routing clients. | Enable the routing clients to use the labels to route to the correct device targets. |
| Agent Desk Settings List dialog box: | 1. Configure the appropriate Agent Desk Settings for each Skill Group. | Assign common attributes such as RONA, Wrap Up Time, etc. for agents. |
| Agent Explorer: | 1. Configure Agents and Supervisors for the site. | Define all the agents and supervisors located at this site. |

Table 4-6 Outbound Option Call Flow: ICM Configuration

| Using the... | Complete this Task... | In Order to... |
|----------------------------|--|--|
| Call Type List dialog box: | 1. Configure the Call Types. | Identify and group outbound calls for routing script and reporting purposes. |
| | 2. Specify Dialed Numbers. | Identify the dialed numbers that belong to each call type. Note: Refer to Important Reminders , page 4-43. |
| Dialed Number dialog box: | 1. Configure the Dialed Numbers for making Reservation Calls. | Identify the phone numbers that can be used by the agents for making reservation calls. Note: These dialed numbers are not CTI Route Points but actual outbound numbers. |
| | 2. Associate the Dialed Numbers with the Call Types that were configured in the previous task. | Build the call types from the configured dialed numbers. |
| Skill Group Explorer: | 1. Configure the Skill Groups. | Define different skill sets that exist in a call center, such as language skills, etc. |
| | 2. Associate Agent IDS with them. | Associate agents with specific skill groups to receive ICM-routed calls. |
| | 3. Add a Route to each Skill Group that you configured. | Enable routing to each skill group via the Script Editor. |

Table 4-6 Outbound Option Call Flow: ICM Configuration

| Using the... | Complete this Task... | In Order to... |
|----------------------------------|--|--|
| Service Explorer: | 1. Configure a Service | Represent the type of processing that a caller requires as a “superset” of skill groups. Create the supersets by assigning various skill groups to them. |
| | 2. Associate the Service that was configured to the appropriate Skill Groups defined in the previous task. | Assign specific services to the skill groups. |
| | 3. Create a Route to the Service. | Provide access to the service for incoming calls. |
| Skill Group Explorer: | 1. Reassociate the Skill Groups to the related Services. | Assign the same skill groups to the related services. |
| Outbound Option Query Rule: | 1. Configure the Query Rules for the Outbound Option. | Define the parameters to choose a specific dialed number from the Import file. |
| Outbound Option Import Rule: | 1. Configure the Import Rule information for the Outbound Option. | Define the actual Import file to be used. |
| Outbound Option Systems Options: | 1. Configure the amount of time allocated to the Campaign. | Define the time parameters for a particular campaign. |
| Outbound Option Dialer: | 1. Configure a range of ports for Agent Reservation calls and Customer calls. | Define a range of ports to be used for making outbound calls. Note: Refer to Important Reminders, page 4-43 . |
| Outbound Option Campaign: | 1. Configure the general information and purpose of the Campaign. | Assign the unique name and description for the particular campaign. |
| | 2. Associate a Query Rule and Skill Group for the Campaign. | Assign a specific query rule and skill group for the particular campaign. |

Cisco CallManager Configuration

Important Reminders

Please be aware of the following as you perform the Cisco CallManager configuration tasks listed in [Table 4-7](#).

- Create the Outbound Option ports on the Cisco CallManager and assign them to the PG User.
- Ensure that you configure the Outbound Option ports as “Cisco 30 VIP” phones.
- Enable the “Call Waiting” feature on the phones of “blended” agents who will use the Outbound Option.

Configuration Tasks

[Table 4-7](#) provides a list of tasks for configuring the Cisco CallManagers at Site3 to handle and process the sample Outbound Option call flow.

Table 4-7 Outbound Option Call Flow: Cisco CallManager Configuration

| Using the... | Complete this Task... | In Order to.... |
|-----------------------------------|---|--|
| Gateway Configuration page: | <ol style="list-style-type: none"> 1. Configure the Gateways at this site. | Receive outbound calls from the PSTN and route them to ICM. Note: Gateways are also used to place outbound calls from the IP enterprise to the PSTN network. |
| Route Group Configuration page: | <ol style="list-style-type: none"> 1. Associate the configured Gateways to the Route Group. | Enable the outbound call to exit the contact center via the correct gateways. |
| Route List Configuration page: | <ol style="list-style-type: none"> 1. Associate the Route Group to the Route List. | Create a list containing several route groups. |
| Route Pattern Configuration page: | <ol style="list-style-type: none"> 1. Create a Route Pattern and associate it with the Route List. | Define a route pattern to choose a specific route list that can be used for routing the call. |

Table 4-7 Outbound Option Call Flow: Cisco CallManager Configuration

| Using the... | Complete this Task... | In Order to.... |
|--|--|--|
| Phone Configuration page: | 1. Configure the Phones to be used by the Agents at this site. | Create a phone and define the phone type and device pool information. |
| Directory Number Configuration page: | 1. Assign Directory Numbers to the Agent Phones. | Specify an unique dialable phone number to each phone. |
| User Information page: | 1. Create an User. | Specify an user to match the JTAPI user configured during ICM PG installation. |
| Device Association Configuration page: | 1. Associate Agent Hard Phones to the User you just created. | Provide the user with monitoring and control capabilities over the devices. |

Outbound Option Call Flow Screens

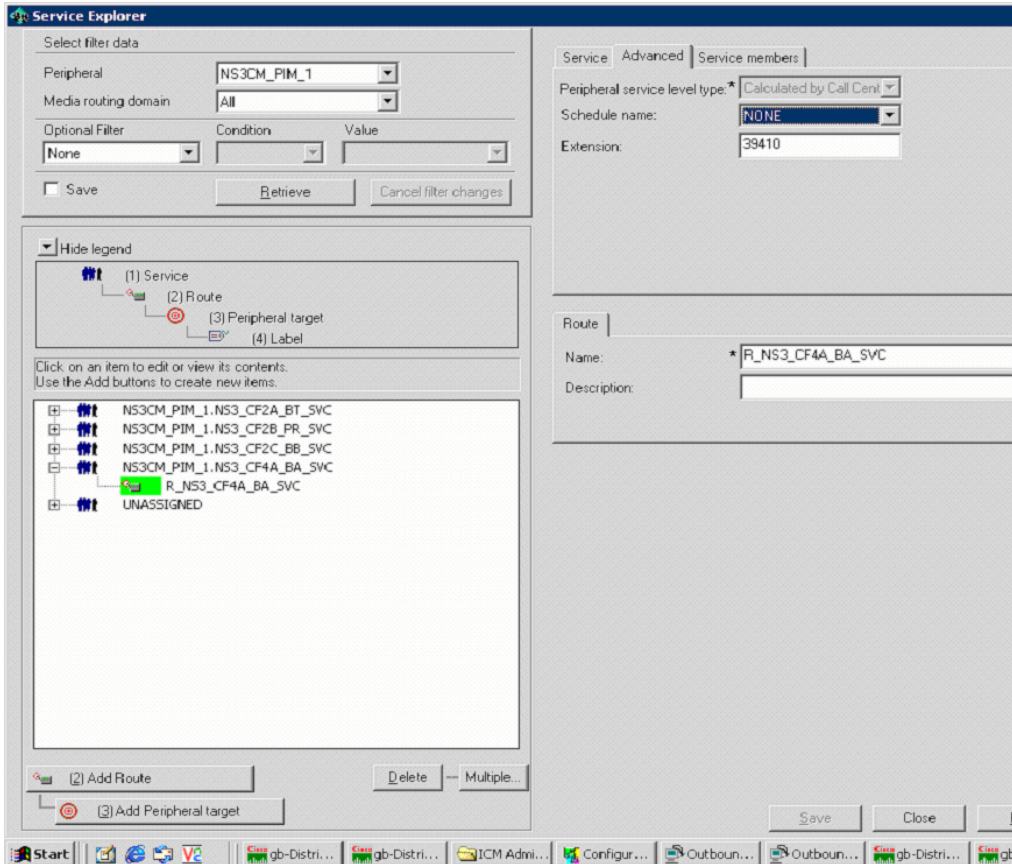
A few strategic screens have been included to provide additional perspective for configuring IPCC components for the Outbound Option call flow.

- ICM Configuration:
 - Service and Route to Service Configuration
 - Dialed Number Configuration
 - Call Type Configuration
 - ICM Routing Script
 - ICM Admin Script

Service Configuration (Advanced)

Figure 4-16 shows the extension used by the Outbound Option Dialer to request ICM to reserve an agent (see Advanced Tab).

Figure 4-16 Outbound Option Call Flow: Advanced Configuration

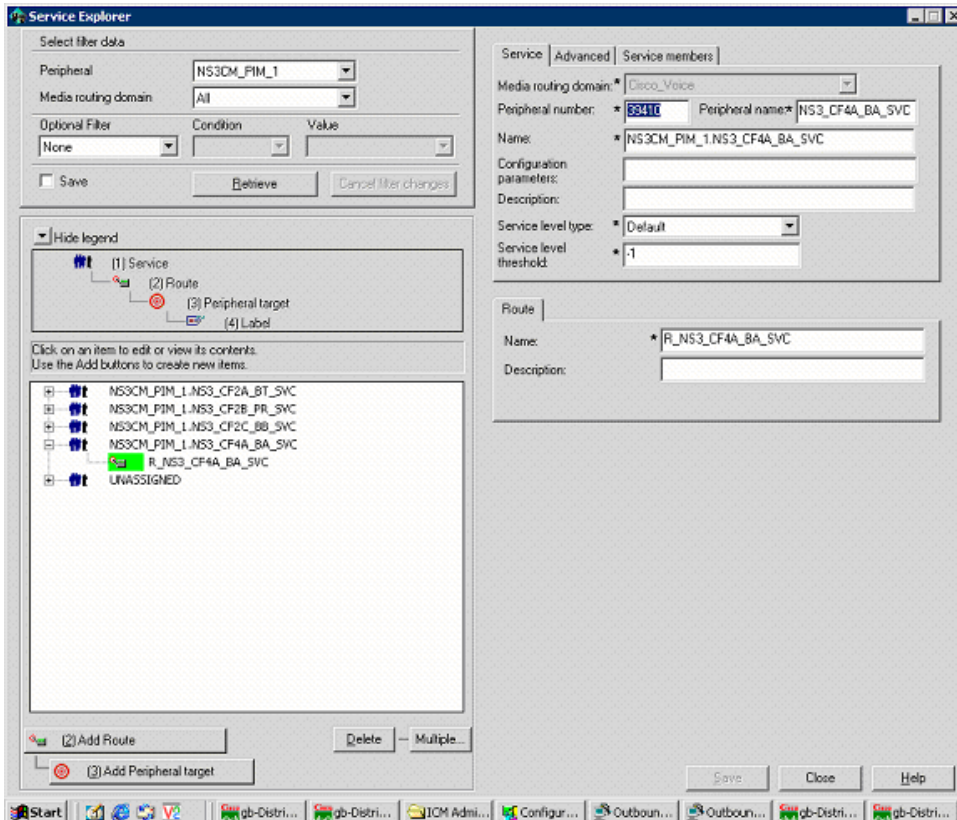


Outbound Option Call Flow (Blended Agent)

Service Configuration (Service)

Figure 4-17 shows the type of service (a customer need that a peripheral handles) being configured, such as Sales, Support, and Information Request (see Service Tab).

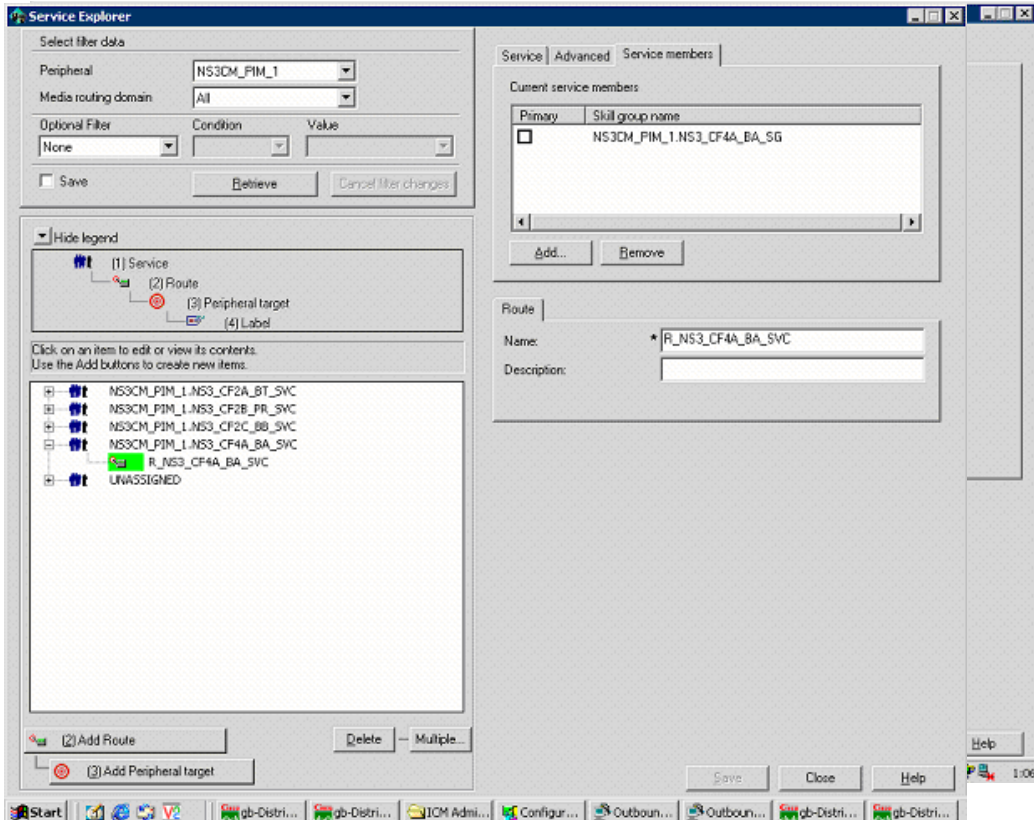
Figure 4-17 Outbound Option Call Flow: Service Configuration



Service Configuration (Service Members)

Figure 4-18 shows the association of the skill groups (as Service Members) to the service (see Service Members tab).

Figure 4-18 Outbound Option Call Flow: Service Members Configuration

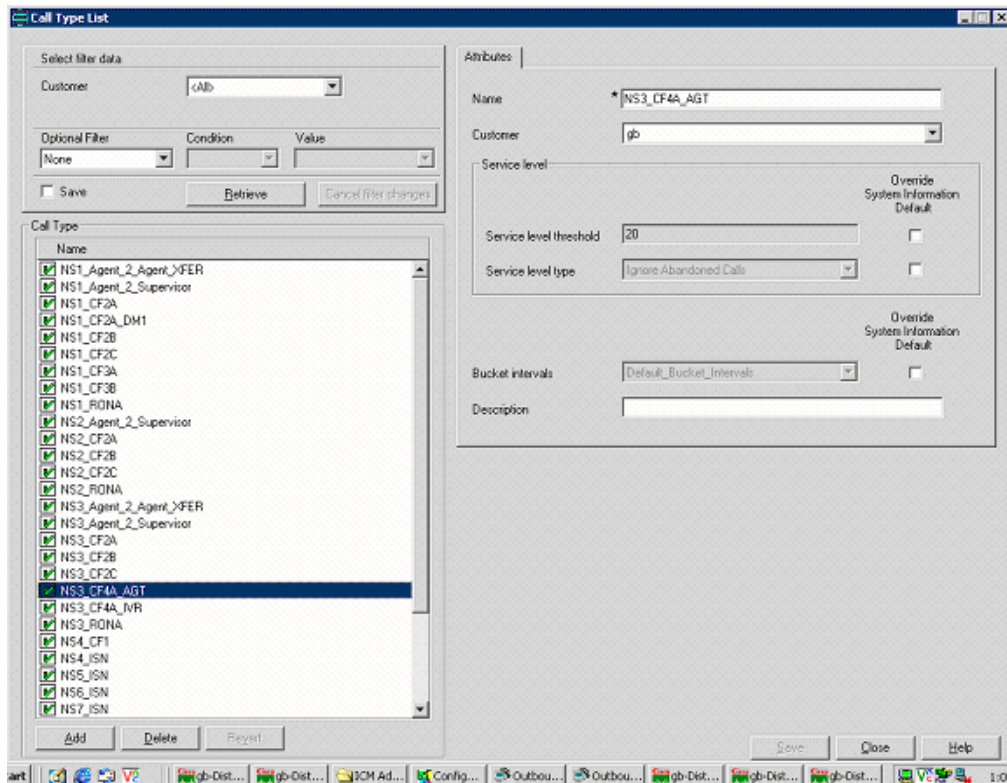


Outbound Option Call Flow (Blended Agent)

Call Type Configuration

Figure 4-19 shows how the dialed number gets mapped to a call type which is eventually mapped to an ICM routing script.

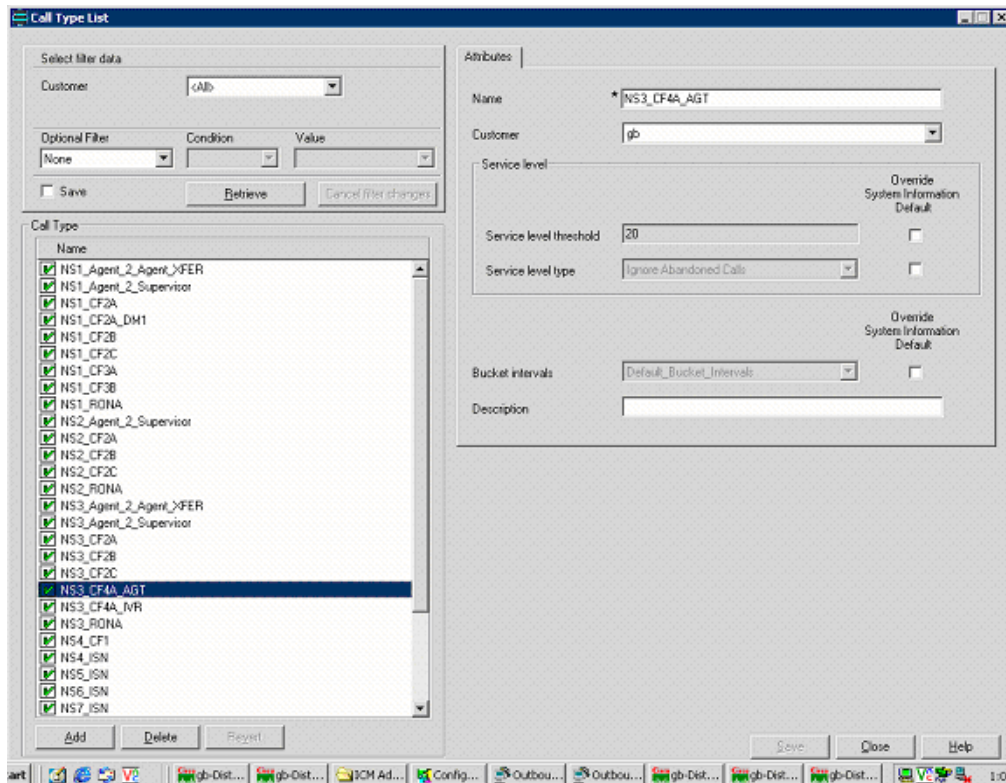
Figure 4-19 Outbound Option Call Flow: Call Type Configuration



Dialed Number Configuration

Figure 4-20 shows how ICM gets the call from the Outbound Option Dialer. The Extension value in the Figure 4-16 screenshot should match the dialed number specified here for the MR PG routing client.

Figure 4-20 Outbound Option Call Flow: Dialed Number Attributes Configuration

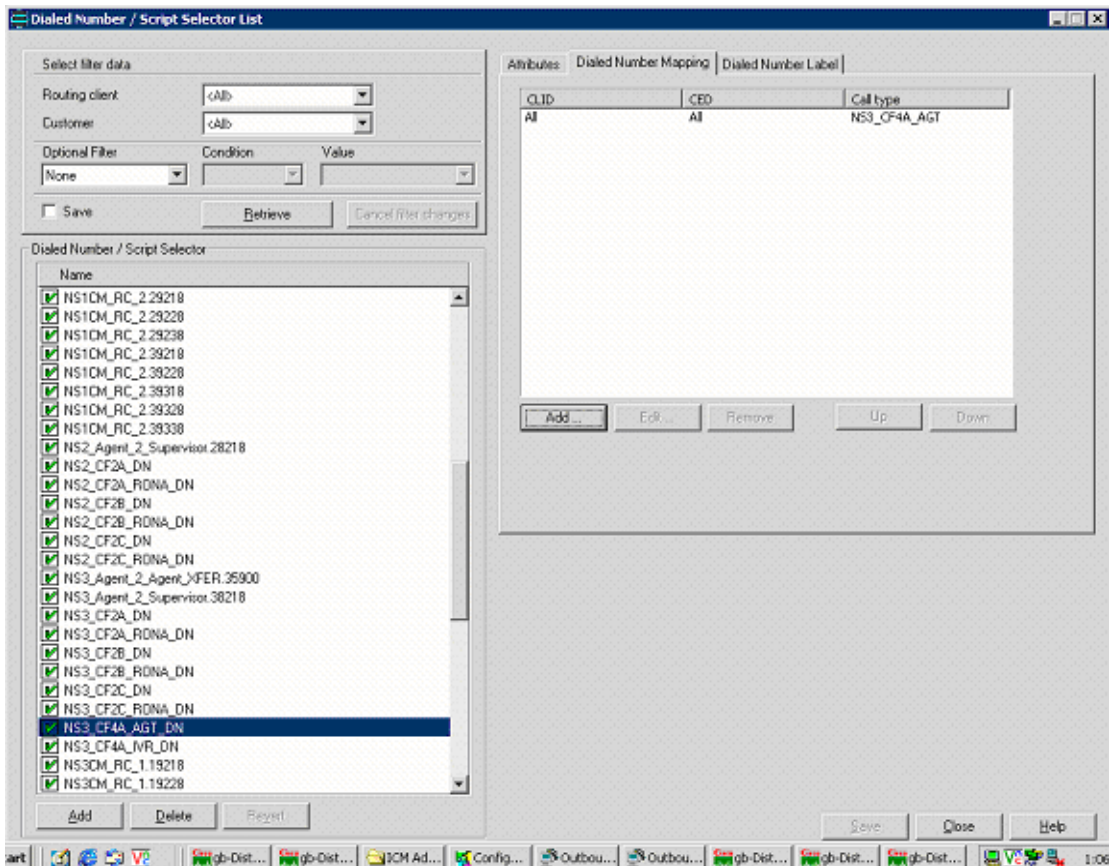


Outbound Option Call Flow (Blended Agent)

Dialed Number Configuration

Figure 4-21 shows how the mapping of the dialed number to the call type shown in the Figure 4-19 screenshot is performed.

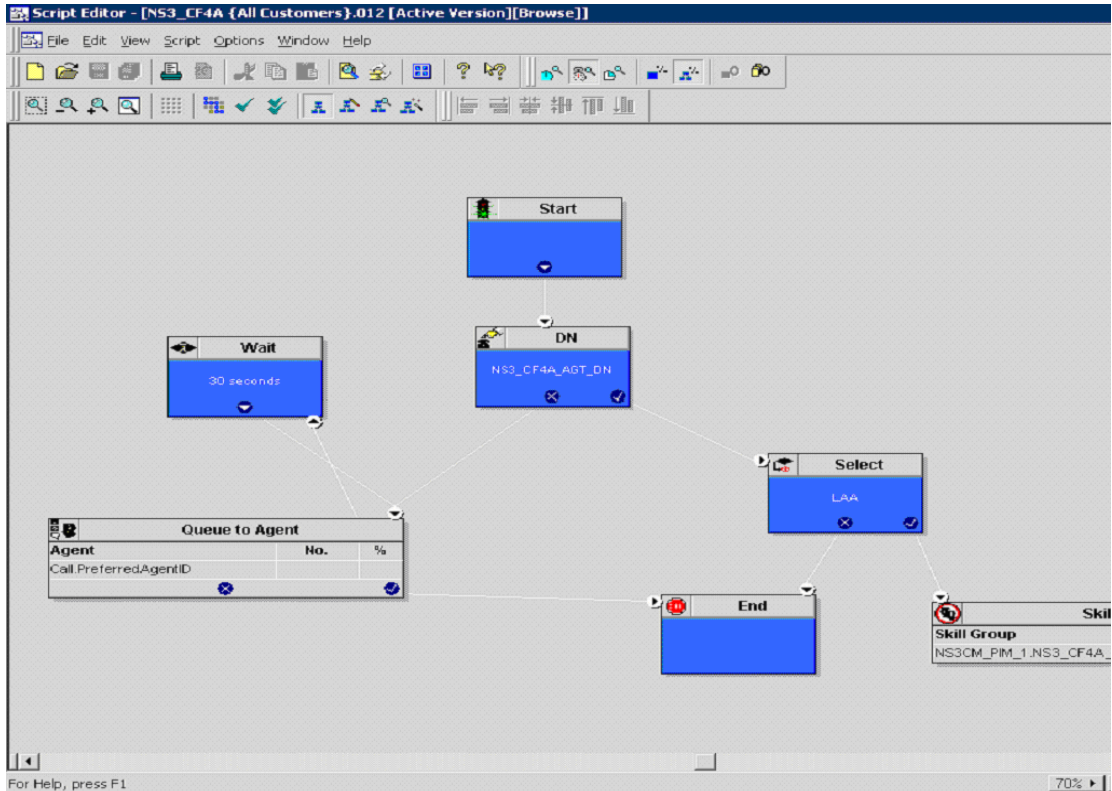
Figure 4-21 Outbound Option Call Flow: Dialed Number Mapping Configuration



ICM Routing Script

Figure 4-22 shows the script that runs in ICM which implements the logic to reserve an agent.

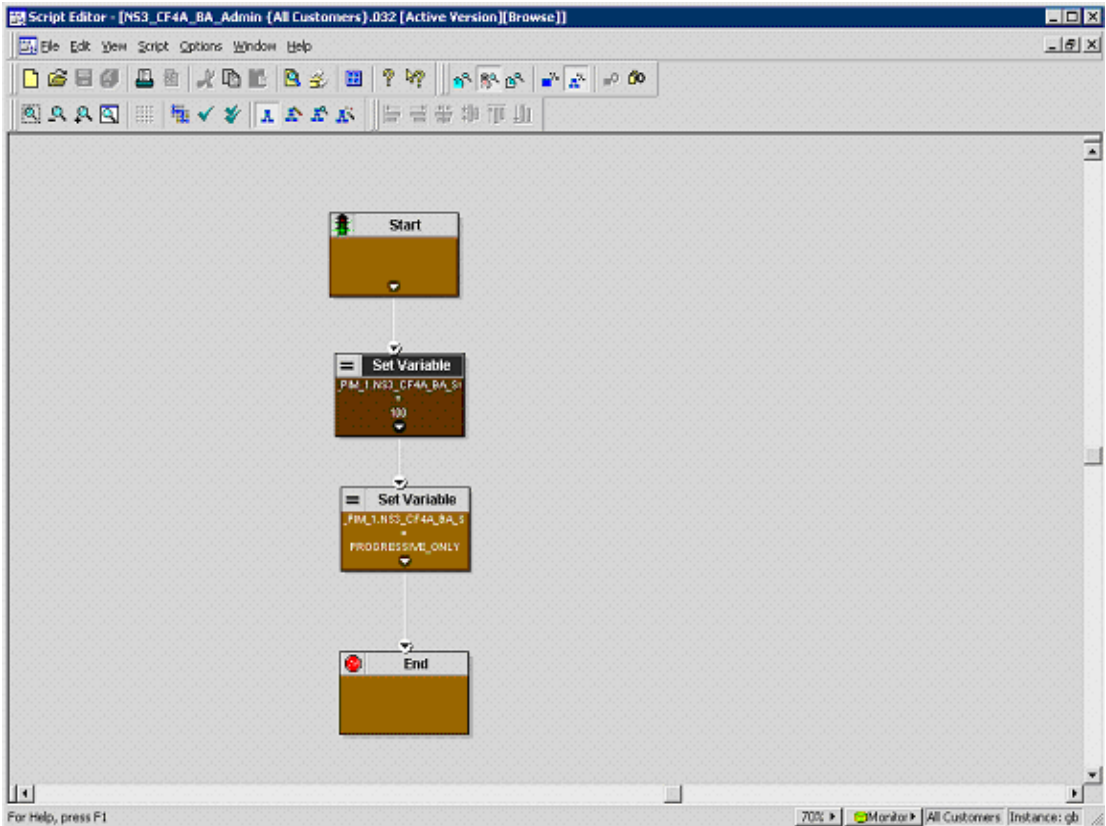
Figure 4-22 Outbound Option Call Flow: ICM Routing Script



ICM Admin Script

Figure 4-23 shows the script that runs in ICM every minute (the frequency is a configurable parameter) to set global variables like Outbound Mode for Agent, Outbound Percentage, and others.

Figure 4-23 Outbound Option Call Flow: ICM Admin Script





Troubleshooting and Technical Tips

This chapter contains the following sections:

- [Troubleshooting, page 5-1](#)
- [Technical Tips, page 5-4](#)
- [Recommendations for High Availability/Call Rates, page 5-7](#)

Troubleshooting

The troubleshooting information contained in this section is derived from IP Communications Systems Test Release 3.0 for IPCC Enterprise. Additional troubleshooting advice may be available in the user documentation for the various components used in the test environment (see [Additional Troubleshooting Resources, page 5-2](#)).

ICM Configuration Change Made but Update Does Not Occur

Symptom: The value of a field is changed, but the change is not reflected in the system.

Possible Solution: Nearly all configuration changes made to ICM/CTI OS are dynamically updated in the system. However, there are the following exceptions, where cycling, or some other kind of manual intervention, is necessary to update the system:

- If a *Supervisor Script Dialed Number* under Agent Team List is changed, issue “*exit_opc*” for OPC to implement the change.
- If the following Agent Desk Settings are changed, the Agent needs to log out and log back in to implement the changes.
 - NotReady reason code
 - Logout reason code
 - Incoming wrapup mode
 - Outgoing wrapup mode
- If the following changes are made to Skill Groups, the Supervisor needs to log out and log back in to implement the changes.
 - Adding agents to a skill group
 - Removing agents from a skill group
- If you add, delete, or update the connection profile in the CTI OS Server registry, make sure you recycle both the CTI OS Server and CTI OS Client (Agent/Supervisor Desktops).

WebView Outbound Option Real-Time Reports

Symptom: WebView Outbound Option real-time report template contains no information.

Possible Solution: Some Outbound Option Dialer reports require the following Outbound Option Dialer registry entry to be set:

RTPortFeedDisable = 0

By default, the Outbound Option Dialer disables call status reporting to the Logger. By setting the above registry entry, the reporting will be enabled. Keep in mind that real-time reports are about 15 seconds old.

Additional Troubleshooting Resources

There are many Cisco manuals that provide troubleshooting information at the solutions level for various hardware and software components. [Table 5-1](#) lists some of these documents. Additional troubleshooting information is available in other product-specific documentation.

Table 5-1 Troubleshooting References

| Troubleshooting Topic | Document | URL |
|-----------------------------------|--|---|
| Cisco CallManager | <ul style="list-style-type: none"> • <i>Troubleshooting Guide for Cisco CallManager</i> • <i>System Error Messages for Cisco CallManager</i> | http://www.cisco.com/univercd/cc/td/doc/product/voice/c_callmg/4_0/index.htm |
| Cisco IP Contact Center | <i>IPCC Troubleshooting Guide</i> | http://www.cisco.com/en/US/products/sw/custcosw/ps1844/products_tech_note09186a00800b6a82.shtml |
| Cisco Outbound Option | <i>Cisco ICM/IP Contact Center Enterprise Edition Outbound Option User Guide</i> , “Troubleshooting” appendix | http://www.cisco.com/univercd/cc/td/doc/product/icm/icmentpr/icm60doc/icm6out/icme60ou.pdf |
| Cisco IP IVR | <i>Troubleshooting Cisco Customer Response Applications</i> | http://www.cisco.com/univercd/cc/td/doc/product/voice/sw_ap_to/apps_3_5/english/admn_app/trbshoot.pdf |
| Cisco Internet Service Node (ISN) | <i>Cisco Internet Service Node (ISN) Configuration and Administration Guide</i> , “Troubleshooting” chapter | http://www.cisco.com/univercd/cc/td/doc/product/icm/isn/isn21/isncfg.pdf |
| Cisco Agent Desktop (CAD) | <i>Service Information: Cisco Desktop Product Suite (IPCC)</i> , “Troubleshooting” chapter | http://www.cisco.com/application/pdf/en/us/guest/products/ps427/c1225/ccmigration_09186a008022b1bd.pdf |
| Cisco CTI Object Server (CTI OS) | <i>Cisco ICM Software CTI OS Troubleshooting Guide</i> | http://www.cisco.com/univercd/cc/td/doc/product/icm/icmentpr/icm60doc/icm6cti/ctios60/cti60tsg.pdf |

Technical Tips

Tips are items to be aware of, ways to avoid problems, and related technical information. The tips contained in this section are derived from IP Communications Systems Test Release 3.0 for IPCC Enterprise. Additional tips may be found in the user documentation for the various components that make up the systems tested. Also see the section [Recommendations for High Availability/Call Rates, page 5-7](#).

Debug Trace Settings for CRS and IP IVR JTAPI Client

If you encounter any problems with CRS, activate the following debug trace settings to generate the debug logs:

- For CRS issues: SS_TEL SS_ICM LIB_ICM
- For JTAPI Client issues: Enable all Trace Levels and select all debug levels except MISC_DEBUGGING.

However, deactivate the above trace settings if you experience any degradation in performance during heavy load situations.

Ring Back Tone when Cisco CallManager Performs Blind Transfer

If a CTI OS Agent initiates a blind transfer (also known as *single-step transfer*) to another available agent, and if the Cisco CallManager, rather than ISN, performs the transfer, you should set the *Send H225 User Info Message* in Cluster Wide Parameter (H323) under Cisco CallManager Service Parameters to *H225 Info for Ring Back*. This enables the customer to hear a ring-back tone when the targeted agent is alerted.

After changing the settings, all relevant Cisco CallManager services have to be recycled. In some instances, the Gatekeeper Controller inter-cluster trunk has to be reset as well.

Enterprise Manager and SQL Server

Enterprise Manager needs a few seconds to determine if the SQL Server is up. If you try to open a database branch prior to Enterprise Manager connecting to the database, it will give you a spurious error.

ICM Process Restarts

If a process fails in ICM initially, it is restarted immediately. However, if it fails again, there is a delay before the process is restarted.

EMT Library

To get information from the EMT library, the trace bits must be set for the process as part of its EMS trace mask. For instance, setting the “0x06” trace bit for *RouterA\EMS\CurrentVersion\Library\Processes\ccag* at the router enables all EMT tracing on the CCAgent process.

Scheduling Callbacks in Outbound Option

The Outbound Option Agent desktop does not receive information about configured dialing times. Therefore, you can schedule a callback at any time. When the call ends, the Campaign Manager checks if the callback time is valid. If it is not valid, the Campaign Manager sets the callback time to the earliest valid time.

**Note**

There is a registry value in the Campaign Manager which controls whether callbacks on Saturday and Sunday are allowed.

Call Information for Outbound Option Agent Desktop

Outbound Option Agent overrides the ANI variable and uses it to pass the customer's phone number. The DNIS and Dialed Number values are the Agent extension.

Outbound Option Personal Callback Registry Updates

During the *CallbackTimeLimit* dialing time period, many attempts may be made to dial the customer. During each attempt, the callback time is rescheduled using the *PersonalCallbackTimetoRetryNoAnswer* and *PersonalCallbackTimetoRetryBusy* registry entries. If a customer is not reached during the *CallbackTimeLimit* dialing window, then the customer record is sent back to the Campaign Manager and the Attempts Count (initially set by *PersonalCallbackMaxAttemptsDefault*) gets decremented by one.

Rescheduling of Outbound Option Outbound Calls

In the Preview mode, if an agent cancels, rejects, or skips a call, the call is rescheduled using the Busy Retry time setting which is usually a minute or two. The reason for using the Busy Timeout is because the call was never made to a customer, so the call can be rescheduled for a quick retry.

In the Predictive/Progressive mode, the customer may have heard a ring so the callback is rescheduled using the no-answer timeout value, which is usually an hour, to minimize annoying the customers.

Skill Groups and Multiple Outbound Option Campaigns

You cannot assign the same skill group to multiple campaigns.

Typically, this means that you need to create a separate skill group for each campaign.

However, if two campaigns are taking place at different time periods, you can assign the same skill group to multiple campaigns by using two separate query rules for the two campaigns. Schedule the query rules based on time. So the skill group will dial Query Rule 1 for one time period and Query Rule 2 for the other time period.

Outbound Option Dialing List and Disabled Query Rules

When you disable the following:

- A Query Rule, you are only telling the Campaign Manager not to retrieve records from that query rule. The query rule still stays in the Dialing List.
- A Campaign, you are disabling dialing for all skills in that Campaign. The Campaign/Query Rule combination still stays in the Dialing List.

Disabling Outbound Option Callback for Busy or No Answer

To disable Callback for a Busy or No Answer, set the Retries value in the Campaign configuration window to 1. This means the Outbound Option Dialer will only try to call a customer once.

Outbound Option Dialing Order is Not Guaranteed within a Query Rule

For instance, if you have an import file with multiple entries, there is no expectation that the first customer in the dialing list will be the first customer dialed.

Maximum Lines per Agent in Outbound Option

The Max Lines Per Agent setting is only necessary in Predictive mode. The Outbound Option Dialer will not exceed this number when calculating how many lines to dial per agent. It does not affect reservation calls; only customer calls.

You should take into account that, if you have many agents available and not enough customers answering calls, the Outbound Option Dialer may not be able to keep all the agents busy.

Recommendations for High Availability/Call Rates

The following section lists a number of design/configuration recommendations that you should consider for all IPCC Enterprise implementations that require high availability and/or high call completion rates.

JTAPI Client Parameter Tuning

Recommendation

To speed up the detection of a CTI Manager failure on either the PG or the IP IVR, reduce the *JTAPI Server Heartbeat Interval* parameter from the default 30 seconds to 5 seconds.

Rationale

Heartbeat values become important only when the system is idle. If call activity is present, CTI/JTAPI will not handshake using heartbeats, but will rely on each other's messages. When the system is idle, heartbeat handshaking goes into effect. So, in essence, a low timer value causes some traffic in the system during idle state, and high timer value causes less traffic during idle state. Since this occurs only when the system is idle, a low timer value will not cause problems.

Under normal operations, the JTAPI client either waits for $2 * \textit{Server Heartbeat Interval}$ before closing the connection to the CTI Manager, or closes it when the socket closed state is detected.

Therefore, for a 30sec Heartbeat timer value, JTAPI closes sockets either after $2 * 30 = 60\text{sec}$ or whenever the socket closed state is detected. For a 5sec Heartbeat timer value, JTAPI closes sockets either after $2 * 5 = 10\text{sec}$ or whenever the socket closed state is detected.



Note

In the test environment, we determined that the detection time of the failure condition improved by 35-45 seconds.

The minimum safe Heartbeat timer value is 5sec. If it is less than this, the CTI Manager will default to a 30sec value.

Recommendation

To speed up the failover of the IP IVR from the primary CTI Manager to the backup CTI Manager, in addition to the *JTAPI Server Heartbeat Interval* parameter, reduce the *Provide Retry Interval* parameter from the default 30 seconds to 5 seconds.

Rationale

Tuning both *Server Heartbeat Interval* and *Provider Retry Interval* parameters improves CTI Manager failure detection (*Server Heartbeat Interval* parameter) and connection to the backup CTI Manager (*Provider Retry Interval* parameter).

Considerations

We also recommend that you decrease the JTAPI client parameters for IPCC servers only, and not for the regular JTAPI client applications.

- Decreasing the timers exposes the application to the effect of network congestion.
- For server applications, lowering these parameters is not problematic; but for client applications, like Softphone, decreasing the retry interval means that all Softphones will try to connect to CTI Manager around the same time.

We may assume that an IPCC Enterprise deployment will not suffer from either of the above considerations, since all communication between PG or IP IVR and CTI Manager will be over a local high-capacity network or protected via QoS over any WAN links.

Additionally, the current recommendations for a standalone Cisco CallManager cluster result in the total number of JTAPI connections to each CTI Manager being less than five; thus avoiding the connection startup overload problem.

Configure /LOAD 0 Parameter for PG

Recommendation

In deployments using ICM 6.0 and CTI OS, change *Configuration Parameters* (Peripheral tab) of the PG in the PG Explorer (blank by default) to */LOAD 0*. This prevents extended failover downtime and state issues upon recovery; particularly, for contact centers with more than 50 agents.

Rationale

In the PG Explorer, there is a field for *Configuration Parameters* for each peripheral device. This parameter defines PIM behavior for failover (when there is a CTI failure that closes the Agent Desktop without logging out), CTI OS failover, or CTI Server failure.

In case of a CTI failure, the PIM wants to prevent calls from being routed to agents who were in the *Available* state before the client disconnected. You can set the configuration parameter to either */LOAD 0* (sets the agent to *NotReady*) or */LOAD 1* (logs out the agent). The PIM defaults to */LOAD 1* behavior, if you do not configure this parameter. In either situation, a special reason code (50002) is passed as an Event Reason Code with the AgentState event and is captured in the Agent_Logout table and reports.

In case of a CTI OS failover, each CTI OS client attempts to restore to its last known state after the agents have failed over to the alternate CTI Server.

/LOAD 0 Characterization

Advantages of /LOAD 0

- Faster failover time than the */LOAD 1* setting because agents are not fully logged out after Disconnect. Instead, they are forced to the *NotReady* state so calls will not be routed to them.
- Generally, a better state for the transition during failover from a reporting perspective, because agents are not reported as logged out during the outage period.
- More call context information is maintained (that is, peripheral and ECC variables, PeripheralCallType indicating whether it is a conference call, transfer call, and so on).

Disadvantages of /LOAD 0

- In rare circumstances, when the Cisco CallManager provides an unexpected CTI event stream, the agent state can be out of step with the actual hard phone state. Usually, the agent is left in a held or talking state but without the call being active on the phone. The default method to recover the agent state and reset the phone is to close the Agent Desktop and log back in. This method of recovery does not work with the */LOAD 0* option.

Other options to reset the hard phone include:

- Press hard phone keys in the following five-character sequence: ***#***.
- An administrator can reset the phone from the Cisco CallManager Administrator web page.

- In hot-seating scenarios, */LOAD 0* may lead to a condition where the agent login is rejected. This can happen because the previous agent who used a phone simply closed their desktop as a means to end their session; rather than actually logging out. Possible remedies for the administrator in this situation include:
 - a. Set an inactivity timer in Agent Desk Settings while configuring ICM so that the agent is logged out after the defined inactivity time.
 - b. Use the Supervisor phone to force the absent agent to logout.
 - c. Reset the phone by pressing phone keys in the following five-character sequence: ***#***.
 - d. Reset the phone from the Cisco CallManager Administrator web page.

Caveats

1. You must configure the Ring No Answer Timeout and associated Ring No Answer Dialed Number in ICM Agent Desk Settings. This is in case an agent recovers to the *Available* state after a failover, but has stepped away from the phone—the call is then redirected to another available agent.
2. You must set the Agent No Activity timer in ICM Agent Desk Settings to log agents out after a period of inactivity while in the *NotReady* state. This reduces the problem of hot-seating agents not being able to log in with the same phone at a later time.

/LOAD 1 Characterization

Advantages of /LOAD 1

- If an agent disconnects without logging out, the next hot-seating agent will not have a problem logging in with the same phone because the previous agent is forcibly logged out.

Disadvantages of /LOAD 1

- Failover can take a long time (possibly several minutes) because it takes a while to log out and log back in a lot of agents. The amount of time will vary with the number of agents and other factors such as heavy call load and number of skill groups per agent.

- Softphone may appear to recover quickly, but then logs out because it fails over to the alternate server before the PIM has forcibly logged out the agent. The automatic login that occurs after this may take a long time as described above.
- May have a negative impact on reporting because agents are reported as having logged out during the outage period.
- Some call context may be lost when the call is recovered, for example, peripheral call variables, ECC variables, and PeripheralCallType (particularly barge in, supervisor assist, and emergency assist PeripheralCallTypes).

Recommendations

- For CTI OS implementations with more than 50 agents, and with the caveats above, we recommend */LOAD 0*.
- For CTI OS implementations with less than 50 agents, */LOAD 1* should be acceptable.

Implement Agent Busy and Ring No Answer (RNA/RONA) Call Logic for Agent ACD Lines



Note

The following applies to a call flow involving IP IVR. For a call flow involving ISN, see the Cisco Internet Service Node (ISN) Configuration and Administration Guide:

<http://www.cisco.com/univercd/cc/td/doc/product/icm/isn/isn21/isncfg.pdf>

Recommendation

1. Implement a Route Point(s) and associated ICM routing scripts to recover calls normally lost due to the Line Busy condition.
2. Configure the Call Forward Busy (CFB) Cisco CallManager parameter on the agent ACD line pointing to this Route Point.

Rationale

In traditional ICM ACD implementations, the RONA (Roll Over No Answer) logic implemented by the ICM CallRouter is sufficient to handle call recovery where call state failures occur (for example, agent does not answer the ringing extension). In an IPCC environment, this event corresponds to a Ring No Answer (RNA) event.

In both cases, the call is correctly routed to an on-hook extension and the error event is the failure to answer.

A problem similar, but not identical, to RNA exists in the more distributed IPCC Enterprise implementation. It is possible, due to various race conditions in the end-to-end call signaling, to have inconsistent line state in the ICM CallRouter and the Cisco CallManager. While, in most cases, this is a transitory effect, it is possible to encounter scenarios where the ICM CallRouter directs a call to a line that is currently busy.

This is an uncommon problem in low call volume environments, but is experienced in high volume scenarios and/or with system error conditions.

**Note**

Higher call volume scenarios currently may experience end-to-end call state signaling latencies in the 1-3 second range.

To provide call recovery in this situation, we highly recommend that another Route Point and associated ICM routing script be used that is distinct from, but implements similar logic to, the RNA call recovery logic. A distinct Route Point provides a mechanism to track the occurrences of this specific error and to take proactive action if the event occurs on a regular basis.

We also highly recommend implementing RNA Call Recovery in addition to Line Busy Recovery. System overload and error conditions may produce both failure events. RNA logic provides protection against system errors as well as failure of agents to answer.

Avoid Conference and Consultative Transfers involving IP IVR Ports

Recommendation

Do not implement business logic that may invoke a consultative transfer or conference involving an IP IVR port.

Rationale

Currently, the JTAPI messaging between the Cisco CallManager and ICM does not provide a mechanism to handle all the potential call state events involved in this process and may fail under certain scenarios.

In high-touch service scenarios, an agent may be required to attempt a warm transfer of a customer to a specialized agent group. If this customer has to be re-queued to an IVR in case an agent is unavailable, implement the following manual process:

1. Agent attempts a consultative transfer to a specific skill group via the route point.
2. If no agents are available (you should build logic into the first routing script to indicate this to the agent), the agent terminates the attempted conference/transfer event.
3. Agent then initiates a blind transfer of the customer call to a second queueing route point for the required skill group.

This requires two route points and two routing scripts breaking up the business logic. Currently, it is not possible to direct an attempted conference or consultative transfer to an IP IVR port and guarantee a successful transfer.

Implement Call Recovery Logic for IP IVR Route Points and CTI Ports

Recommendation

Configure CFB, CFF, CFNA on all IP IVR Route Points and CTI Ports directing the call to an ICM call recovery Route Point(s) and associated routing script(s).

Rationale

If you do not implement error recovery mechanisms, system/server resource and call state information may be delayed between the various IPCC components resulting in lost calls. During various timing windows, it is possible for ICM to sometimes direct the Cisco CallManager to send a call to an IP IVR which is unable to process that call. For example, in situations such as IP IVR failover, IP IVR out of service, or IP IVR partial service with only one of 60 configured CTI ports operational.

Implementing a mechanism that provides recovery from IP IVR failure and the ability to respond or process a call enables a high-level of redundancy and availability.

To maximize call processing success rates, we suggest that you implement a layered call recovery design as described above.

Implement Call Recovery Logic for ICM Route Points

Recommendation

Configure CFB, CFF, CFNA on all ICM Route Points (Post and Translation Routes) directing the call to an independent call-processing component (for example, Cisco Unity or standalone Cisco IP IVR).

Rationale

The interface between the Cisco CallManager and ICM is a single-threaded JTAPI client connection. This connection has a redundant configuration, but with the following limitations:

- Failure of the CTI Manager or the PG results in a 60-second contact center outage.
- JTAPI messaging congestion or failure results in lost calls.

To minimize both of these limitations, we recommend configuring the Cisco CallManager to forward calls to a third-party application for processing. In failure tests with this set up, it was possible to successfully answer more than 95% of all calls arriving during the failure event window.

**Note**

These calls are not handled by ICM and, therefore, do not appear in any ICM reports.

Disable Call Waiting

Recommendation

Set the Cisco CallManager cluster Call Waiting flag to *False*.

Rationale

Inconsistency of device/line state between the Cisco CallManager and ICM due to system error, race condition, or messaging latency can result in ICM directing calls to agent lines which are already off-hook. For the RNA/Agent Busy call recovery mechanisms to detect and recover this call, disable Call Waiting for the contact center agents.

This enables the Cisco CallManager to immediately detect failure of the agent to handle the call and invoke the ICM recovery scripts.



Note

This assumes that the ICM recovery scripts have been implemented.

Call Waiting Enable Flag

This parameter enables or disables call waiting for the Cisco CallManager. This is a required field. Change the default setting from *True* to *False*.



Note

Call Waiting can be a global setting on the Cisco CallManager and, if so, you should change it there as well.

Disk Drive Recommendations for High Traffic Systems

Recommendation

Add an additional disk drive for log files if you anticipate sustained high traffic levels.

In situations where you expect long periods of traffic at or above the system's engineered capacity, we recommend that you direct log files to a disk drive that does not contain the OS or operating software.

Rationale

During the course of system load and stress testing, we observed the following:

- Long periods of traffic at or above the system's engineered capacity ran with lower Cisco CallManager CPU rates, if system logfiles were directed to a disk drive that did not contain the OS and operating software.
- This was especially true when log levels were set higher than normal (more data was logged when simulating a troubleshooting activity).

If you anticipate any of the conditions described above, we highly recommend that a second disk drive be added to all nodes in a Cisco CallManager cluster, including any IP IVR servers.



Failure, Failover, and Recovery

The IPCC Enterprise environment as a whole is intended to be redundant and self-healing. In many cases, this makes the failover and recovery from a failure nearly invisible.

This subject is discussed in greater detail in documents such as:

- *Cisco ICM Software Administration Guide (Fault Tolerance chapter)*
<http://www.cisco.com/univercd/cc/td/doc/product/icm/icmentpr/icm60doc/corEICM6/config60/icme60ag.pdf>
- *Cisco CallManager System Guide*
http://www.cisco.com/univercd/cc/td/doc/product/voice/c_callmg/4_1/sys_ad/4_1_2/ccmsys/index.htm
- *Cisco CallManager Features and Services Guide*
http://www.cisco.com/univercd/cc/td/doc/product/voice/c_callmg/4_1/sys_ad/4_1_2/ccmfeat/index.htm

This chapter provides a description of specific test cases that were executed as a part of IP Communications System Test Release 3.0 failover testing. This testing was done to verify the redundancy and failover capabilities of specific components such as Gatekeepers, WAN Access Routers, and the private connection between the Roggers in the data centers.



Note

Much of the testing was done with specific test tools, simulated phones, and simulated agent desktops. In an actual customer setting, real agents with real phones might attempt to shut down their desktops, force logins, etc. Such events are not generally factored into the testing done with simulation tools.

This chapter includes the following sections:

- [Failure with Failover Testing, page 6-2](#)
 - [CCM Post-Routed Call Flow, page 6-2](#)
 - [ISN Post-Routed Call Flow, page 6-5](#)
- [Failure without Failover Testing, page 6-8](#)
 - [WAN Access Router, page 6-8](#)
 - [Private Connection Between Roggers, page 6-11](#)

Failure with Failover Testing

This section discusses the failover testing that was done with IPCC components that have redundancy capabilities in the event of a failure.

CCM Post-Routed Call Flow

Test 1: Gatekeeper Failure

Pre-Test Conditions

The following describes the test conditions for this particular test:

- Test sites involved include Site1 and Site3.
- Cisco CallManagers clusters are located at both Site1 and Site3. There are two Gatekeepers in a GUP cluster in Site1.
- Cisco CallManagers and Gatekeepers at the sites are configured so that GK1 at Site1 is the primary Gatekeeper and GK2 is the secondary or alternate Gatekeeper.
- Cisco CallManagers are registered to GK1 at Site1.
- CTI OS Agents at Site1 and CAD Agents at Site3 are logged in and ready to handle calls.

Test

The following describes the failover testing done for active CCM Post-Routed calls:

1. Place PSTN call (DMS or PBX) to Site1 dialed number.
2. Answer the call with Site1 CTI OS agent desktop.
3. Initiate conference call to Site3 dialed number.
4. Disable the switch port connected to Site1 GK1 and make GK1 inactive.
5. Place a second call to Site1 dialed number.
6. Answer call with Site1 agent desktop.
7. Conference call to Site3 dialed number.

Results

The following results were verified in the above test:

- All newly-placed inter-cluster calls were completed with GK1 inactivated (disabled) and GK2 activated.
- All active calls remained active and no calls were dropped.
- Announcements (IP IVR) and music (MOH) were heard by the callers.
- Call failures did not occur during the failover between GK1 and GK2.
- No pop-ups were displayed on the agent desktops.
- The voice path was operational in both directions, to and from the PSTN.

Test 2: Gatekeeper Failure (under load)

Pre-Test Conditions

The following describes the test conditions for this particular test:

- Test sites involved include Site1 and Site3.
- Cisco CallManager clusters are located at both Site1 and Site3. There are two Gatekeepers in a GUP cluster in Site1.

- Cisco CallManagers and Gatekeepers at the sites are configured so that GK1 at Site1 is the primary Gatekeeper and GK2 is the secondary or alternate Gatekeeper.
- Cisco CallManagers are registered to GK1 at Site1.
- CTI OS Agents at Site1 and CAD Agents at Site3 are logged in using the appropriate simulation tools and ready to handle calls.
- At least one agent at both sites is logged in using the real CTI OS/CAD Agent Desktop and IP phones.
- Script is setup to transfer calls from Site1 skill group to the same skill group in Site3.

Test

The following describes the failover testing done for active and transient (under load) CCM Post-Routed calls:

1. Generate calls with the simulation call generation tool to Site1 dialed number at 1% of total call rate for Site1.
2. Disable the switch port connected to Site1 GK1 and make it inactive.

Results

The following results were verified in the above test:

- All newly-placed inter-cluster calls were completed with GK1 inactivated (disabled) and GK2 activated.
- All active calls remained active and no calls were dropped.
- Only a small percentage of transient calls failed during the failover between GK1 and GK2.
- No pop-ups were displayed on the agent desktops.

ISN Post-Routed Call Flow

Test 1: ISN Gatekeeper Failure

Pre-Test Conditions

The following describes the test conditions for this particular test:

- Test site involved is Site4.
- Inbound calls at Site4 are routed from the ISN gateway to the ISN Voice Browser.
- Two Gatekeepers (GK1 and GK2) in Site4 are deployed in an HSRP redundancy model.
- ICM script is set up to first connect the call to a Type 7 VRU (VXML-enabled Gateway) and collect digits.
- All agents in the target skill group are flagged as NOT_READY.
- ICM script is then set up to queue the incoming call at the VRU.
- The status for an agent in that skill group is set to become READY after the call has been queued for 30 seconds.

Test

The following describes the failover testing done for active ISN Post-Routed calls:

1. Place calls from a PBX/DMS phone to the ISN gateway at Site4.
2. Verify that the VRU plays the appropriate media files and provides queue treatment for the incoming calls.
3. Disable the primary Gatekeeper (GK1) in the HSRP cluster.
4. Place additional calls from the PBX/DMS which are now routed through the secondary Gatekeeper (GK2) in the HSRP cluster.
5. Make agents available in Site4 for the skill groups selected by the caller and answer the calls from a CAD Agent Desktop.

Results

The following results were verified in the above test:

- All active calls remained active and no calls were dropped.
- Call failures did not occur during the failover between the ISN gatekeepers.
- Announcements (IP IVR) and music (MOH) were heard by the callers,
- Pop-up errors were not displayed on the agent desktop.
- The voice path was operational in both directions, to and from the PSTN.

Test 2: ICT Gatekeeper Failure

Pre-Test Conditions

The following describes the test conditions for this particular test:

- Test sites involved are Site1 and Site4.
- Inbound calls at Site4 are routed from the ISN gateway to the ISN Voice Browser.
- The two ICT Gatekeepers at Site1 (involved in the inter-cluster communication between Site1 and Site4) are in a GUP redundancy model.
- ICM script for Site4 calls is set up to first connect the call to a Type 7 VRU (VXML-enabled Gateway) and collect digits.
- All agents in the target skill group are flagged as NOT_READY.
- ICM script is then set up to queue the incoming call at the VRU.

Test

The following describes the failover testing done for active ISN Post-Routed calls:

1. Place calls from a PBX/DMS phone to the ISN gateway at Site4.
2. Verify that the VRU plays the appropriate media files and provides queue treatment for the incoming calls.
3. Make one agent available from the target skill group.
4. Answer one incoming call at the agent desktop.

5. Disable the primary ICT Gatekeeper in the GUP cluster at Site1.
6. Make sure that the active call to the agent is still active.
7. Ensure that agents are available from the target skill group for the rest of the queued calls.
8. Place additional calls from the PBX/DMS which are now routed to agents via the secondary ICT gatekeeper at Site1.

Results

The following results were verified in the above test:

- All the calls were redirected properly to the agents and answered by the agents in Site4.
- Call failures did not occur during the failover between the ICT gatekeepers.
- Announcements (IP IVR) and music (MOH) were heard by the callers,
- Pop-up errors were not displayed on the agent desktop.
- The voice path was operational in both directions, to and from the PSTN.

Failure without Failover Testing

This section discusses the failover testing that was done with IPCC components that did not have redundancy capabilities in the event of a failure.

WAN Access Router

Pre-Test Conditions

The following describes the test conditions for this particular test:

- Test site involved is Site5.
- All links for Site5 are up and active.
- A WAN router is deployed at this site for communication with other sites across the Frame Relay cloud.
- Calls at Site5 are in progress in the ISN IOS Voice Browser and on CAD Agent Desktops with at least one Supervisor monitoring an agent call.
- There is no backup implemented for the serial interface on the WAN router at Site5.

Test

The following describes the failover testing done for the WAN Access Router (without a backup WAN link):

1. Disable the serial interface of the WAN router at Site5 and observe the impact to system behavior.
2. Verify the results of the above procedure as described in [After Disabling the Serial Interface, page 6-9](#).
3. Enable the serial interface of the WAN router at Site5 and observe the impact to system behavior.
4. Verify the results of the above procedure as described in [After Enabling Serial Interface, page 6-10](#).

Results

The following results were verified in the above test:

**Note**

No impact is expected to Site4 call processing or agent states. All failures occur at Site5.

After Disabling the Serial Interface

For new calls generated from the PSTN:

- New inbound calls to the ISN IOS Voice Browser (Gateway) can behave in one of two ways, depending upon the gateway configuration:
 - They can fail with a busy tone.
 - or –
 - They can be re-routed or “tromboned,” using a Gateway Redirect Dial Peer, as new calls to the ISN at another inter-cluster site (Site4 or Site6).

For transient calls (already in the ISN IOS Voice Browser and being transferred to agents):

- If the call was re-directed by the IOS Voice Browser to an agent, the call continued the transfer and rang at the agent phone. This occurred only if the call reached the agent phone before the phone realized that it had lost the WAN connection with its Cisco CallManager.
- If the call had not yet been re-directed by the IOS Voice Browser to an agent, the call either failed or, if a backup re-direct was programmed in the gateway, the call was “tromboned” to another ISN site (Site4 or Site6) within the cluster.
- If the call was in queue on the IOS Voice Browser, the call either failed, or if a backup re-direct was programmed in the gateway, the call was “tromboned” to another ISN site (Site4 or Site6) within the cluster.

**Note**

In all cases, the H.323 call survivability timer impacted the life of the call. Be aware that all calls may be removed from the ingress gateway after this timer expires.

For existing calls being handled by agents:

- Calls stayed active and operational until the call ended normally or until the H.323 timer expired.
- The following was the impact observed to the agent state for agents in Site5:
 - Agents lost connectivity to the CAD servers at Site4 and the agent desktops were in a NOT_READY state until the WAN connection was restored.
 - Agents already engaged on calls were not be able to perform any agent state change or telephony functions, such as hold/conference/transfer, during the outage event.
 - Agents were not be able to log into the system during this event.
 - ICM showed the remote agents at Site5 as being no longer available (the Webview report showed the remote agents as being logged out).
- The following was the impact observed to Supervisor Monitoring:
 - Supervisor already in a monitor session with the agent and caller remained in the call for the duration of the call, or until the H.323 timer expired and the call was terminated by the gateway.
 - Supervisor was not be able to perform any call control functions to barge in, intercept, or perform any conference/chat functions on the Supervisor desktop.

After Enabling Serial Interface

- Phones were reset and re-registered with their target Cisco CallManager.
- Agent desktops reconnected to the CAD Servers and depending upon the phone state (reset or not) allowed the agents to become READY without having to log in again.
- Agents that were not logged in were able to now log in (if the IP phones were reset properly).
- The ISN Voice Browser at Site4 re-registered with the ISN Application Server at Site4 and began to accept calls normally.
- Any calls that were in the gateway prior to the failure and were ‘tromboned’ to another site remained in this state, until the call was terminated normally. In this situation, the gateway will not automatically terminate the calls.

Private Connection Between Roggers

Pre-Test Conditions

The following describes the test conditions for this particular test:

- Test sites involved are Site and Site4.
- Rogger A is located at Site1 and Rogger B is located in Site4.
- All links between the two sites are up and active.
- Calls are in progress between the Site1 and Site4 Cisco CallManager clusters.
- There is no backup implemented for the private connection between the two Roggers at Site1 and Site4.

Test

The following describes the failover testing done for the private connection between the Roggers (without a backup connection):

1. Simulate a failure of the private link between Rogger A and Rogger B.
2. Verify the system behavior immediately after the simulated private link failure as described in [After the Private Link Failure, page 6-11](#).
3. Place calls from a PBX/MDS phone and route them between Site1 and Site4.
4. Verify the system behavior after the private link was restored as described in [After the Private Link was Restored, page 6-12](#).

Results

The following results were verified in the above test:

After the Private Link Failure

- Via the Event Viewer, both Roggers indicated a loss of heart beats on the private network after missing five consecutive 100ms heart beats.
- The Roggers sent Test Other Side (TOS) messages to the Peripheral Gateway which responded with either Rogger A or Rogger B as the enabled side of the system.
- Based on the Rogger that was considered the “enabled” side, the other Rogger became “disabled.”

- The enabled Rogger then initiated the “Enabled Simplex” operation (visible in the MDS process window).
- There was no impact observed to system operation or behavior.
- There was no loss of calls or agent state across the system during this failure.

After the Private Link was Restored

- The Roggers observed the presence of a duplex partner and performed a state transfer operation from the Active side to the Inactive side call router.
- Upon completion of the state transfer operation, the MDS processes reported both Roggers were in an active duplex operation.
- No impact to call processing was observed during this event window.



Release Versions of Components

The following tables show the release versions of the hardware and software components used in IP Communications Systems Test Release 3.0 for IPCC Enterprise:

- [Table A-1 on page A-1](#)—Software release versions of IPCC components
- [Table A-2 on page A-3](#)—Firmware release versions of Cisco IP Phones

Table A-1 *Software Recommendations for the IP Communications Systems Release 3.0 – IPCC Enterprise*

| Component | Release Version |
|--|-----------------|
| Cisco CallManager | 4.0(2a) SR1a |
| Cisco CallManager—Cisco IP Telephony Operating System | 2000.2.6 SR5 |
| Cisco Customer Response Solutions (IP IVR) | 3.5(2) SR1 |
| Cisco Customer Response Solutions—Cisco IP Telephony Operating System | 2000.2.6 SR5 |
| Cisco Intelligent Contact Management (ICM) | 6.0 SR1 |
| Cisco Intelligent Contact Management (ICM)—Cisco IP Telephony Operating System | Win2000 SP4 |
| Cisco Internet Service Node (ISN) | 2.1HF16 |
| Cisco Internet Service Node (ISN)—Cisco IP Telephony Operating System | Win2000 SP4 |
| Cisco Telephony Integration Option (CTI OS) | 6.0.0 |
| Cisco Agent Desktop | 6.0(1) |

Table A-1 Software Recommendations for the IP Communications Systems Release 3.0 – IPCC Enterprise (continued)

| Component | Release Version |
|---|------------------------|
| ScanSoft Open Speech Recognizer (OSR) | 1.1.4 |
| ScanSoft Open Speech MRCP Server (OSMS) | 1.2 |
| Cisco CSS 11501 Content Services Switch | WebNs 7.10.5.04 |
| Cisco 1751 (ISN VXML voice gateway) | 12.3(7)T3 |
| Cisco 1760 (ISN VXML voice gateway) | 12.3(7)T3 |
| Cisco 3640A (ISN VXML voice gateway) | 12.3(7)T3 |
| Cisco 3660 (ISN VXML voice gateway) | 12.3(7)T3 |
| Cisco 3745 (ISN VXML voice gateway) | 12.3(7)T3 |
| Cisco AS5350 (ISN VXML voice gateway) | 12.3(7)T3 |
| Cisco AS5400HPX (ISN VXML voice gateway) | 12.3(7)T3 |
| Cisco 3660 (HSRP gatekeeper) | 12.3(7)T3 |
| Cisco 3660 (GUP gatekeeper) | 12.3(8)T5 |
| Cisco 3660 (voice/data gateway) | 12.3(8)T5 |
| Cisco 3745 (voice/data gateway) | 12.3(8)T5 |
| Cisco 2691 (core/WAN router) | 12.3(6a) |
| Cisco 7206 (core/WAN router) | 12.3(6a) |
| Cisco 7507 (Frame Relay switch) | 12.0(28)S |
| Cisco Catalyst 3524 (access switch) | 12.0(5)WC10 |
| Cisco Catalyst 6506, 6509 (voice access switch) | Cat 8.3(3) |
| Cisco Catalyst 6506, 6509 (core switch) | Cat 7.6(9) |
| Cisco Catalyst 6506, 6509 (MSFC) | 12.1(23)E1 |
| Cisco Catalyst Communications Media Module (CMM) | 12.3(8)XY |
| Cisco Security Agent Management Center | 4.0.3 build 728 |
| Cisco Security Agent Engine—Cisco CallManager | 4.0.3 build 728 |
| Cisco Security Agent Policy—Cisco CallManager | 1.1.9 |
| Cisco Security Agent Engine—Cisco Customer Response Solutions | 4.0.3 build 728 |

Table A-1 Software Recommendations for the IP Communications Systems Release 3.0 – IPCC Enterprise (continued)

| Component | Release Version |
|--|--------------------------------|
| Cisco Security Agent Policy—Cisco Customer Response Solutions | 1.1.9 |
| Cisco Security Agent Engine—Intelligent Contact Management (ICM) | 4.0.2 build 629 |
| Cisco Security Agent Policy—Intelligent Contact Management (ICM) | 1.0.6 |
| Cisco Security Agent Engine—Internet Service Node (ISN) | 4.0.2 build 629 |
| Cisco Security Agent Policy—Internet Service Node (ISN) | 1.1.2 |
| Anti-virus—McAfee | Enterprise 7.1.0 |
| CiscoWorks 2000 ITEM | 2.0(2) |
| Cisco IP Phones models 7912G, 7940, 7960 | Bundled with Cisco CallManager |

Table A-2 Firmware Release Versions of Cisco IP Phones for the IP Communications Systems Release 3.0 – IPCC Enterprise

| Phone Model | Firmware Version |
|----------------------|-------------------------|
| Cisco IP Phone 7912G | CP7912050000SCCP041022A |
| Cisco IP Phone 7940G | P00306000500 |
| Cisco IP Phone 7960G | P00306000500 |



Infrastructure Components Configuration Commands

This appendix contains a few sample configuration commands for general infrastructure components such as gateways, switches and routers that are deployed at the various test sites. The configuration commands are site-specific and site-relevant.

Site-specific physical and logical topology maps are provided in [Chapter 2, “Test Scenarios and Site Models”](#).

This appendix contains the following sections:

- [Site1 Cisco 7206VXR WAN Router, page B-2](#)
- [Site1 Cisco Catalyst 6506 Core Switch, page B-12](#)
- [Site1 Cisco Catalyst 6509 Access Switch, page B-59](#)
- [Site2 Cisco Catalyst 3524 Access Switch, page B-94](#)

Gateway, Switch, and Router Configurations

Site1 Cisco 7206VXR WAN Router

```
Device Configuration Viewer
ns1-7206

Global
! Last configuration change at 16:50:40 US_EDT Thu Aug 12 2004
! NVRAM config last updated at 16:50:53 US_EDT Thu Aug 12 2004
version 12.3
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
service compress-config
hostname ns1-7206
boot-start-marker
boot system disk2:c7200-ik9s-mz.123-6a.bin
boot-end-marker
logging queue-limit 100
logging buffered 262144 debugging
clock timezone EST -5
clock summer-time US_EDT recurring
no aaa new-model
priority-list 1 protocol ip high list 120
priority-list 1 queue-limit 120 20 80 60
exception protocol ftp
exception dump 10.12.13.212
ntp clock-period 17180012
ntp server 10.12.2.1

IP

IP-IP Global
ip subnet-zero
no ip source-route
ip cef
ip tcp synwait-time 5
no ip ftp passive
ip ftp username nsite
ip ftp password lab
ip domain name ipcc.com
ip name-server 10.12.3.72
ip name-server 10.12.7.47
ip classless
```

```
ip route 10.12.8.0 255.255.255.0 Serial1/0.5
ip route 10.12.11.0 255.255.255.0 Serial1/0.7
ip route 10.12.13.0 255.255.255.0 10.12.2.1
ip route 192.168.101.8 255.255.255.248 Serial3/7:1
ip flow-export version 5
ip flow-export destination 10.12.13.212 9995
no ip http server
no ip http secure-server
ip ospf name-lookup

IP-IP AccessList extended NS1-NS5_IPSEC_ACL
ip access-list extended NS1-NS5_IPSEC_ACL
permit ip 10.12.3.0 0.0.0.255 10.12.8.0 0.0.0.255

IP-IP AccessList extended NS1-NS7_IPSEC_ACL
ip access-list extended NS1-NS7_IPSEC_ACL
permit ip 10.12.3.0 0.0.0.255 10.12.11.0 0.0.0.255

IP-IP AccessList extended NS5_TO_FIREWALL
ip access-list extended NS5_TO_FIREWALL
permit ip 10.12.8.0 0.0.0.255 any

IP-IP AccessList extended NS7_TO_FIREWALL
ip access-list extended NS7_TO_FIREWALL
permit ip 10.12.11.0 0.0.0.255 any

Controller

Controller-Controller T1 3/0
controller T1 3/0
framing esf
clock source internal
linecode b8zs
channel-group 1 timeslots 1-24
description T1 to NS4-7206 T1 3/0 (RGR PVT CONNECTION)

Controller-Controller T1 3/1
controller T1 3/1
framing esf
linecode b8zs
channel-group 1 timeslots 1-24
description To 7507 Frame Relay Switch

Controller-Controller T1 3/2
controller T1 3/2
framing esf
linecode b8zs
```

```
Controller-Controller T1 3/3
  controller T1 3/3
  framing esf
  linecode b8zs

Controller-Controller T1 3/4
  controller T1 3/4
  framing esf
  linecode b8zs

Controller-Controller T1 3/5
  controller T1 3/5
  framing esf
  linecode b8zs

Controller-Controller T1 3/6
  controller T1 3/6
  framing esf
  linecode b8zs

Controller-Controller T1 3/7
  controller T1 3/7
  framing esf
  linecode b8zs
  channel-group 1 timeslots 1-24
  description To ns1-3725

Class-map

Class-map-Class-map match-any ICM-LOW-PRIORITY
  class-map match-any ICM-LOW-PRIORITY
  match ip dscp af11

Class-map-Class-map match-all VOICE-CONTROL
  class-map match-all VOICE-CONTROL
  match ip dscp af31

Class-map-Class-map match-all VOICE
  class-map match-all VOICE
  match ip dscp ef

Policy-map

Policy-map-Policy-map WAN-EDGE
  policy-map WAN-EDGE
  class VOICE
  priority percent 33
  class VOICE-CONTROL
```

```
bandwidth percent 2
class ICM-LOW-PRIORITY
bandwidth percent 25

Crypto

Crypto-Crypto ISAKMP

Crypto-Crypto ISAKMP-Crypto ISAKMP Policy

Crypto-Crypto ISAKMP-Crypto ISAKMP Policy-Crypto ISAKMP Policy 1
crypto isakmp policy 1
hash md5
authentication pre-share

Crypto-Crypto ISAKMP-Crypto ISAKMP Global
crypto isakmp key gbipcc_ipsec address 10.12.19.6
crypto isakmp key gbipcc_ipsec address 10.12.19.2

Crypto-Crypto IPsec

Crypto-Crypto IPsec-Crypto IPsec Transform Set

Crypto-Crypto IPsec-Crypto IPsec Transform Set-Crypto IPsec Transform
Set gb3Set ah-md5-hmac esp-des
crypto ipsec transform-set gb3Set ah-md5-hmac esp-des

Crypto-Crypto Map

Crypto-Crypto Map-Crypto Map NS1NS5_IPSEC 10 ipsec-isakmp
crypto map NS1NS5_IPSEC 10 ipsec-isakmp
set peer 10.12.19.2
set transform-set gb3Set
match address NS1-NS5_IPSEC_ACL

Crypto-Crypto Map-Crypto Map NS1NS7_IPSEC 10 ipsec-isakmp
crypto map NS1NS7_IPSEC 10 ipsec-isakmp
set peer 10.12.19.6
set transform-set gb3Set
match address NS1-NS7_IPSEC_ACL

Interface

Interface-Interface Loopback0
interface Loopback0
description router-id for ospf
ip address 200.0.0.1 255.255.255.255
```

```
Interface-Interface Loopback3
  interface Loopback3
  description NTP IP Address
  ip address 10.12.3.138 255.255.255.255

Interface-Interface GigabitEthernet0/1
  interface GigabitEthernet0/1
  description link to NS1-CORE1-4/48
  no ip address
  duplex full
  speed 100
  media-type rj45
  no negotiation auto

Interface-Interface GigabitEthernet0/1.1
  interface GigabitEthernet0/1.1
  encapsulation dot1Q 2
  ip address 10.12.2.7 255.255.255.224
  no ip redirects

Interface-Interface GigabitEthernet0/1.10
  interface GigabitEthernet0/1.10
  description link to NS1-CORE1 4/48 OSPF Vlan
  encapsulation dot1Q 10
  ip address 10.12.3.98 255.255.255.252
  no ip redirects
  ip ospf priority 255

Interface-Interface GigabitEthernet0/1.901
  interface GigabitEthernet0/1.901
  description NS1-RGRA_PVT_VLAN
  encapsulation dot1Q 901
  ip address 192.168.101.3 255.255.255.248
  no ip redirects

Interface-Interface GigabitEthernet0/2
  interface GigabitEthernet0/2
  ip address 10.12.3.102 255.255.255.252
  duplex full
  speed 100
  media-type rj45
  no negotiation auto

Interface-Interface GigabitEthernet0/3
  interface GigabitEthernet0/3
  no ip address
  shutdown
  duplex auto
```

```
speed auto
media-type rj45
no negotiation auto

Interface-Interface Serial1/0
interface Serial1/0
description DS3 to 7507 1/0/0
mtu 1500
no ip address
encapsulation frame-relay
ip route-cache flow
dsu bandwidth 44210
framing c-bit
cablelength 10
serial restart-delay 0
frame-relay traffic-shaping

Interface-Interface Serial1/0.2 point-to-point
interface Serial1/0.2 point-to-point
ip address 10.12.17.1 255.255.255.252
frame-relay interface-dlci 102
class qos

Interface-Interface Serial1/0.3 point-to-point
interface Serial1/0.3 point-to-point
ip address 10.12.17.5 255.255.255.252
frame-relay interface-dlci 103
class qos

Interface-Interface Serial1/0.4 point-to-point
interface Serial1/0.4 point-to-point
ip address 10.12.17.9 255.255.255.252
frame-relay interface-dlci 104
class qos

Interface-Interface Serial1/0.5 point-to-point
interface Serial1/0.5 point-to-point
ip address 10.12.19.1 255.255.255.252
ip policy route-map NS5-FW
frame-relay interface-dlci 105
class qos
crypto map NS1NS5_IPSEC

Interface-Interface Serial1/0.6 point-to-point
interface Serial1/0.6 point-to-point
ip address 10.12.17.17 255.255.255.252
frame-relay interface-dlci 106
class qos
```

```
Interface-Interface Serial1/0.7 point-to-point
interface Serial1/0.7 point-to-point
ip address 10.12.19.5 255.255.255.252
ip policy route-map NS7-FW
frame-relay interface-dlci 107
class qos
crypto map NS1NS7_IPSEC
```

```
Interface-Interface Serial1/1
interface Serial1/1
no ip address
shutdown
dsu bandwidth 44210
framing c-bit
cablelength 10
serial restart-delay 0
```

```
Interface-Interface Serial2/0
interface Serial2/0
no ip address
shutdown
dsu bandwidth 44210
framing c-bit
cablelength 10
serial restart-delay 0
```

```
Interface-Interface Serial2/1
interface Serial2/1
no ip address
shutdown
dsu bandwidth 44210
framing c-bit
cablelength 10
serial restart-delay 0
```

```
Interface-Interface Serial3/0:1
interface Serial3/0:1
ip address 192.168.101.17 255.255.255.252
priority-group 1
```

```
Interface-Interface Serial3/1:1
interface Serial3/1:1
ip address 10.12.13.33 255.255.255.252
```

```
Interface-Interface Serial3/7:1
interface Serial3/7:1
ip address 192.168.101.17 255.255.255.252
```


IP Routing

```
IP Routing-Routing ospf 1
  router ospf 1
  router-id 200.0.0.1
  log-adjacency-changes
  area 1 range 10.12.3.0 255.255.255.0
  network 10.12.3.98 0.0.0.0 area 1
  network 10.12.3.138 0.0.0.0 area 1
  network 10.12.17.0 0.0.0.255 area 0
```

Map Class

```
Map Class-Map Class frame-relay qos
  map-class frame-relay qos
  frame-relay cir 6144000
  frame-relay bc 1000
  frame-relay mincir 6144000
  service-policy output WAN-EDGE
```

Access Lists

```
Access Lists-Extended IP AccessLists 120
  access-list 120 permit tcp host 192.168.101.2 any
  access-list 120 permit tcp any host 192.168.101.10
  access-list 120 permit udp any any range 39000 39999
  access-list 120 permit udp any range 39000 39999 any
```

```
route-map NS5-FW permit 10
  route-map NS5-FW permit 10
  match ip address NS5_TO_FIREWALL
  set ip next-hop 10.12.3.101
```

```
route-map NS7-FW permit 10
  route-map NS7-FW permit 10
  match ip address 107 NS7_TO_FIREWALL
  set ip next-hop 10.12.3.101
```

SNMP

```
snmp-server community ***** RW
snmp-server enable traps snmp authentication linkdown linkup
coldstart warmstart
snmp-server enable traps tty
snmp-server enable traps casa
snmp-server enable traps gatekeeper
snmp-server enable traps xgcp
snmp-server enable traps cnpd
```

```

snmp-server enable traps isdn call-information
snmp-server enable traps isdn layer2
snmp-server enable traps isdn chan-not-avail
snmp-server enable traps isdn ietf
snmp-server enable traps atm subif
snmp-server enable traps channel
snmp-server enable traps srp
snmp-server enable traps hsrp
snmp-server enable traps config
snmp-server enable traps entity
snmp-server enable traps envmon
snmp-server enable traps aaa_server
snmp-server enable traps bgp
snmp-server enable traps pim neighbor-change rp-mapping-change
invalid-pim-message
snmp-server enable traps ipmulticast
snmp-server enable traps msdp
snmp-server enable traps rsvp
snmp-server enable traps frame-relay
snmp-server enable traps frame-relay subif
snmp-server enable traps rtr
snmp-server enable traps stun
snmp-server enable traps dlsw
snmp-server enable traps bstun
snmp-server enable traps pppoe
snmp-server enable traps ipmobile
snmp-server enable traps dial
snmp-server enable traps dsp card-status
snmp-server enable traps isakmp policy add
snmp-server enable traps isakmp policy delete
snmp-server enable traps isakmp tunnel start
snmp-server enable traps isakmp tunnel stop
snmp-server enable traps ipsec cryptomap add
snmp-server enable traps ipsec cryptomap delete
snmp-server enable traps ipsec cryptomap attach
snmp-server enable traps ipsec cryptomap detach
snmp-server enable traps ipsec tunnel start
snmp-server enable traps ipsec tunnel stop
snmp-server enable traps ipsec too-many-sas
snmp-server enable traps voice poor-qov
snmp-server enable traps dnis

```

Dial-peer

```

Dial-peer-Dial-peer cor custom
dial-peer cor custom

```

Gatekeeper

```
gatekeeper
shutdown

Line

Line-Line con 0
  line con 0
  exec-timeout 30 0
  privilege level 15
  logging synchronous
  transport preferred all
  transport output all
  stopbits 1

Line-Line aux 0
  line aux 0
  transport preferred all
  transport output all
  stopbits 1

Line-Line vty 0 4
  line vty 0 4
  exec-timeout 30 0
  privilege level 15
  password*****
  logging synchronous
  no login
  transport preferred all
  transport input all
  transport output all

Line-Line vty 5 15
  line vty 5 15
  login
  transport preferred all
  transport input all
  transport output all
```

Site1 Cisco Catalyst 6506 Core Switch

```
Device Configuration Viewer
ns1-core-sw

Supervisor

Supervisor-Global
  set feature agg-link-partner disable
  set option long-cable disable
  set password*****
  set enablepass*****
  set prompt NS1-CORE
  set length 24 default
  set logout 30
  set config mode binary
  set banner motd ""
  set banner lcd ""
  commit qos acl all
  set qos acl map ACL_IP-PHONES 114
  set qos policy-source local
  set qos rsvp disable
  set qos rsvp policy-timeout 30
  set qos rsvp local-policy forward

Supervisor- ***** ALL (DEFAULT and NON-DEFAULT) CONFIGURATION *****

Supervisor-time
  #time: Wed Aug 18 2004, 14:43:58 EST

Supervisor-version
  #version 8.2(2)

Supervisor-system web interface version Engine Version: 5.3.4 ADP
Device: Cat6000 ADP Version: 5.0 ADK: 40

Supervisor-test
  set test diaglevel minimal
  set test diagfail-action offline

Supervisor-dot1x
  set dot1x system-auth-control enable
  set dot1x quiet-period 60
  set dot1x tx-period 30
  set dot1x shutdown-timeout 0
  set dot1x supp-timeout 30
  set dot1x server-timeout 30
```

```
set dot1x max-req 2
set dot1x re-authperiod 3600
set feature dot1x-radius-keepalive enable

Supervisor-firewall
  set firewall multiple-vlan-interfaces enable

Supervisor-errordetection
  set errordetection inband disable
  set errordetection memory disable
  set errordetection packet-buffer errdisable
  set errordetection portcounter disable

Supervisor-system
  set system baud 9600
  set system modem disable
  set system name NS1-CORE
  set system location NSITE-lab2 rack 236
  set system contact
  set system countrycode
  set traffic monitor 100
  set system highavailability enable
  set system highavailability versioning disable
  set system info-log disable
  set system info-log tftp 0.0.0.0 sysinfo
  set system info-log interval 1440
  set system crossbar-fallback bus-mode
  set system switchmode allow truncated
  set system switchmode threshold 2
  set system core-dump enable
  set system core-file slot0:crashinfo
  set system syslog-dump disable
  set system syslog-file slot0:sysloginfo
  set system supervisor-update disable
  set feature log-command enable
  set feature loop-detect enable
  set feature supmon enable

Supervisor-power
  set power redundancy enable

Supervisor-Default Inlinepower
  set inlinepower defaultallocation 7000

Supervisor-frame distribution method
  set port channel all distribution ip both

Supervisor-mac address reduction
```

```
set spantree macreduction disable

Supervisor-default portcost mode
set spantree defaultcostmode short

Supervisor-snmp
set snmp community*****
set snmp community*****
set snmp community*****
set snmp rmon disable
set snmp rmonmemory 85
set snmp enable
set snmp trap enable module
set snmp trap enable chassis
set snmp trap enable bridge
set snmp trap enable vtp
set snmp trap enable vlancreate
set snmp trap enable vlandelete
set snmp trap enable auth
set snmp trap enable entityfru
set snmp trap enable ippermit
set snmp trap enable sysinfolog
set snmp chassis-alias
set snmp buffer 40
set snmp trap enable vmps
set snmp trap enable entity
set snmp trap enable config
set snmp trap enable stpx
set snmp trap enable syslog
set snmp trap enable system
set snmp trap enable envfan
set snmp trap enable envshutdown
set snmp trap enable envpower
set snmp trap enable envtemp
set snmp trap enable envstate
set snmp trap enable flashinsert
set snmp trap enable flashremove
set snmp trap enable callhomesntp
set snmp trap enable macnotification
set snmp trap enable redundancy

Supervisor-tacacs+
set tacacs attempts 3
set tacacs directedrequest disable
set tacacs timeout 5

Supervisor-radius
set radius deadtime 0
```

```
set radius timeout 5
set radius retransmit 2
set radius attribute framed-ip-address include-in-access-req
disable
```

Supervisor-kerberos

```
Supervisor-authentication
set authentication login tacacs disable console
set authentication login tacacs disable telnet
set authentication login tacacs disable http
set authentication enable tacacs disable console
set authentication enable tacacs disable telnet
set authentication enable tacacs disable http
set authentication login radius disable console
set authentication login radius disable telnet
set authentication login radius disable http
set authentication enable radius disable console
set authentication enable radius disable telnet
set authentication enable radius disable http
set authentication login local enable console
set authentication login local enable telnet
set authentication login local enable http
set authentication enable local enable console
set authentication enable local enable telnet
set authentication enable local enable http
set authentication login kerberos disable console
set authentication login kerberos disable telnet
set authentication login kerberos disable http
set authentication enable kerberos disable console
set authentication enable kerberos disable telnet
set authentication enable kerberos disable http
set authentication login attempt 3 console
set authentication login attempt 3 telnet
set authentication login lockout 0 console
set authentication login lockout 0 telnet
set authentication enable attempt 3 console
set authentication enable attempt 3 telnet
set authentication enable lockout 0 console
set authentication enable lockout 0 telnet
```

Supervisor-Local User

```
set localuser authentication disable
```

Supervisor-stp mode

```
set spantree mode pvst+
```

Supervisor-vtp

```

set vtp domain gb-ipcc
set vtp mode transparent unknown
set vtp mode server vlan
set vtp passwd cisco
set vtp version 1
set vtp pruning disable
set vtp pruneeligible 2-1000
clear vtp pruneeligible 1001-1005
set vlan 2 name ManagementVlan type ethernet mtu 1500 said 100002
state active
set vlan 10 name NS1_OSPF_VLAN type ethernet mtu 1500 said 100010
state active
set vlan 11 name Firewall_outside_vlan type ethernet mtu 1500 said
100011 state active
set vlan 12 name Firewall_inside_Vlan type ethernet mtu 1500 said
100012 state active
set vlan 98 name NS0-CAT6K type ethernet mtu 1500 said 100098 state
active
set vlan 101 name NS1_ACS1_CCM_VLAN type ethernet mtu 1500 said
100101 state active
set vlan 102 name NS1_ACS2_CCM_VLAN type ethernet mtu 1500 said
100102 state active
set vlan 103 name NS1_ACS1_Simclient_VLAN type ethernet mtu 1500
said 100103 state active
set vlan 104 name NS1_ACS2_Simclient_VLAN type ethernet mtu 1500
said 100104 state active
set vlan 105 name NS1_Ciltest_ACS1 type ethernet mtu 1500 said
100105 state active
set vlan 106 name NS1_Ciltest_ACS2 type ethernet mtu 1500 said
100106 state active
set vlan 107 name NS1_ICM_ACS1 type ethernet mtu 1500 said 100107
state active
set vlan 108 name NS1_ICM_ACS2 type ethernet mtu 1500 said 100108
state active
set vlan 109 name NS1_GK_ACS1 type ethernet mtu 1500 said 100109
state active
set vlan 110 name NS1_GK_ACS2 type ethernet mtu 1500 said 100110
state active
set vlan 113 name NS1_DESKTOP_VLAN type ethernet mtu 1500 said
100113 state active
set vlan 114 name NS1_IP_PHONES_VLAN type ethernet mtu 1500 said
100114 state active
set vlan 151 name IP_VOICE_CCIE_VLAN type ethernet mtu 1500 said
100151 state active
set vlan 204 name NS2_Desktop_VLAN type ethernet mtu 1500 said
100204 state active
set vlan 205 name NS2_IP_Phones_VLAN type ethernet mtu 1500 said
100205 state active

```



```
    set vlan 307 name NS3_Desktop_VLAN type ethernet mtu 1500 said
100307 state active
    set vlan 308 name NS3_IP_Phone_VLAN type ethernet mtu 1500 said
100308 state active
    set vlan 401 name NS4_CM_VLAN type ethernet mtu 1500 said 100401
state active
    set vlan 402 name NS4_Simclient_VLAN type ethernet mtu 1500 said
100402 state active
    set vlan 403 name NS4_CADSIM_VLAN type ethernet mtu 1500 said
100403 state active
    set vlan 404 name NS4_ICM_VLAN type ethernet mtu 1500 said 100404
state active
    set vlan 405 name NS4_GK_GWY_VLAN type ethernet mtu 1500 said
100405 state active
    set vlan 408 name NS4_CAD_Servers_VLAN type ethernet mtu 1500 said
100408 state active
    set vlan 409 name NS4_IP_Phones_VLAN type ethernet mtu 1500 said
100409 state active
    set vlan 410 name NS4_Desktop_VLAN type ethernet mtu 1500 said
100410 state active
    set vlan 504 name NS5_Desktop_VLAN type ethernet mtu 1500 said
100504 state active
    set vlan 505 name NS5_IP_Phone_VLAN type ethernet mtu 1500 said
100505 state active
    set vlan 604 name NS6_Desktop_VLAN type ethernet mtu 1500 said
100604 state active
    set vlan 605 name NS6_IP_Phone_VLAN type ethernet mtu 1500 said
100605 state active
    set vlan 701 name NS7_CM_VLAN type ethernet mtu 1500 said 100701
state active
    set vlan 702 name NS7_ICM_VLAN type ethernet mtu 1500 said 100702
state active
    set vlan 703 name NS7_Simclient_VLAN type ethernet mtu 1500 said
100703 state active
    set vlan 704 name NS7_Ciltest_VLAN type ethernet mtu 1500 said
100704 state active
    set vlan 705 name NS7_GW_VLAN type ethernet mtu 1500 said 100705
state active
    set vlan 706 name NS7-DESK1 type ethernet mtu 1500 said 100706
state active
    set vlan 707 name NS7_IP_Phone_VLAN type ethernet mtu 1500 said
100707 state active
    set vlan 801 name NS0_Servers type ethernet mtu 1500 said 100801
state active
    set vlan 803 name NS0-DESKTOPS type ethernet mtu 1500 said 100803
state active
    set vlan 804 name NS0_MISC_VLAN type ethernet mtu 1500 said 100804
state active
```

```

    set vlan 888 rspan name VLAN0888 state active
    set vlan 901 name NS1-RGRA_PVT_VLAN type ethernet mtu 1500 said
100901 state active
    set vlan 904 name NS4-RGRB_PVT_VLAN type ethernet mtu 1500 said
100904 state active
    set vlan 1002 name fddi-default type fddi mtu 1500 said 101002
state active
    set vlan 1004 name fddinet-default type fddinet mtu 1500 said
101004 state active stp ieee
    set vlan 1005 name trnet-default type trbrf mtu 1500 said 101005
state active stp ibm
    set vlan 1,164
    set vlan 1003 name token-ring-default type trcrf mtu 1500 said
101003 state active mode srb aremaxhop 7 stemaxhop 7 backupcrf off

```

```

Supervisor-dot1q-all-tagged
    set dot1q-all-tagged disable

```

```

Supervisor-Layer 2 protocol tunnel
    set l2protocol-tunnel cos 5
    set l2protocol-tunnel trunk disable

```

```

Supervisor-ip
    set feature mdg enable
    set feature psync-recovery no-powerdown
    set interface sc0 2 10.12.2.5/255.255.255.224 10.12.2.31
    set interface sc0 up
    set interface trap sc0 disable
    set interface sl0 0.0.0.0 0.0.0.0
    set interface sl0 up
    set interface trap sl0 disable
    set interface scl 0 0.0.0.0/0.0.0.0 0.0.0.0
    set interface scl down
    set interface trap scl disable
    set arp agingtime 1200
    set ip redirect enable
    set ip unreachable enable
    set ip fragmentation enable
    set ip route 0.0.0.0/0.0.0.0 10.12.2.6
    set ip alias default 0.0.0.0

```

```

Supervisor-command alias

```

```

Supervisor-vmpls
    set vmpls server retry 3
    set vmpls server reconfirminterval 60
    set vmpls downloadmethod tftp
    set vmpls downloadserver 0.0.0.0 vmpls-config-database.1

```

```
set vmps state disable

Supervisor-rcp
set rcp username

Supervisor-ftp
set ftp username
set ftp password encrypted
set ftp mode passive enable

Supervisor-dns
set ip dns server 10.12.3.72 primary
set ip dns server 10.12.7.47
set ip dns enable
set ip dns domain ipcc.com

Supervisor-spantree
set spantree global-default portfast disable
set spantree global-default loop-guard disable

Supervisor-portfast
set spantree global-default bpdu-guard disable
set spantree global-default bpdu-filter disable

Supervisor-bpdu-skewing
set spantree bpdu-skewing disable

Supervisor-MST (IEEE 802.1s)
set spantree fwwdelay 15 mst
set spantree hello 2 mst
set spantree maxage 20 mst
set spantree mst maxhops 20
set spantree priority 32768 mst
set spantree priority 32768 mst 1
set spantree priority 32768 mst 2
set spantree priority 32768 mst 3
set spantree priority 32768 mst 4
set spantree priority 32768 mst 5
set spantree priority 32768 mst 6
set spantree priority 32768 mst 7
set spantree priority 32768 mst 8
set spantree priority 32768 mst 9
set spantree priority 32768 mst 10
set spantree priority 32768 mst 11
set spantree priority 32768 mst 12
set spantree priority 32768 mst 13
set spantree priority 32768 mst 14
set spantree priority 32768 mst 15
```

Supervisor-MST Configuration

```

set spantree mst config rollback force
set spantree mst config name revision 0
set spantree mst 0 vlan 1-4094
set spantree mst config commit

```

Supervisor-uplinkfast groups

```

set spantree uplinkfast disable

```

Supervisor-backbonefast

```

set spantree backbonefast disable

```

Supervisor-vlan parameters

```

set spantree enable
1-2,10-12,98,101-110,113-114,151,164,204-205,307-308,401-405,408-410,5
04-505,604-605,701-707,801,803-804,888,901,904
set spantree fwddelay 15
1-2,10-12,98,101-110,113-114,151,164,204-205,307-308,401-405,408-410,5
04-505,604-605,701-707,801,803-804,888,901,904
set spantree hello 2
1-2,10-12,98,101-110,113-114,151,164,204-205,307-308,401-405,408-410,5
04-505,604-605,701-707,801,803-804,888,901,904
set spantree maxage 20
1-2,10-12,98,101-110,113-114,151,164,204-205,307-308,401-405,408-410,5
04-505,604-605,701-707,801,803-804,888,901,904
set spantree priority 32768
1-2,10-12,98,101-110,113-114,151,164,204-205,307-308,401-405,408-410,5
04-505,604-605,701-707,801,803-804,888,901,904

```

Supervisor-syslog

```

set logging console enable
set logging telnet enable
set logging server disable
set logging level cdp 4 default
set logging level mcast 2 default
set logging level dtp 5 default
set logging level dvlan 2 default
set logging level earl 2 default
set logging level ip 3 default
set logging level pruning 2 default
set logging level snmp 2 default
set logging level spantree 2 default
set logging level sys 5 default
set logging level tac 2 default
set logging level tcp 2 default
set logging level telnet 2 default
set logging level tftp 2 default

```

```
set logging level vtp 2 default
set logging level vmps 2 default
set logging level kernel 2 default
set logging level fileysys 2 default
set logging level mgmt 5 default
set logging level mls 5 default
set logging level protfilt 2 default
set logging level security 2 default
set logging level radius 2 default
set logging level udld 4 default
set logging level gvrp 2 default
set logging level cops 3 default
set logging level qos 3 default
set logging level acl 5 default
set logging level rsvp 3 default
set logging level ld 3 default
set logging level privatevlan 3 default
set logging level ethc 5 default
set logging level gl2pt 5 default
set logging level callhome 2 default
set logging server facility LOCAL7
set logging server severity 4
set logging timestamp enable
set logging buffer 500
set logging history 1
set logging history severity 4
```

Supervisor-Callhome Functionality

```
set logging callhome disable
set logging callhome severity 2
```

Supervisor-ntp

```
set ntp broadcastclient disable
set ntp broadcastdelay 3000
set ntp client enable
set ntp authentication disable
set ntp server 10.12.2.1
set timezone EDT -5 0
set summertime enable EST
set summertime recurring first Sunday April 01:00 last Sunday
October 01:00 60
```

Supervisor-set boot command

```
set boot config-register 0xf
set boot config-register auto-config overwrite
set boot config-register auto-config sync disable
set boot system flash bootflash:cat6000-sup2cvk8.8-2-2.bin
set boot system flash bootflash:cat6000-sup2k8.8-1-1.bin
```

```
set boot system flash slot0:cat6000-sup2cvk8.7-6-2.bin
set boot system flash bootflash:cat6000-sup2k8.7-6-1.bin
set config acl nvram
```

```
Supervisor-permit list
  set ip permit disable telnet
  set ip permit disable ssh
  set ip permit disable snmp
```

```
Supervisor-permanent arp entries
```

```
Supervisor-igmp
  set igmp enable
  set igmp fastleave disable
  set igmp v3-processing disable
  set igmp fastblock disable
  set igmp ratelimit disable
  set igmp ratelimit general-query 100
  set igmp ratelimit dvmrp 100
  set igmp ratelimit mospf1 100
  set igmp ratelimit mosfp2 100
  set igmp ratelimit pimv2 100
```

```
Supervisor-igmp querier
  set igmp querier disable 1-1005,1025-4094
  set igmp querier 1-1005,1025-4094 qi 125
  set igmp querier 1-1005,1025-4094 oqi 300
```

```
Supervisor-rgmp
  set rgmp disable
```

```
Supervisor-protocolfilter
  set protocolfilter disable
```

```
Supervisor-mls
  set mls flow destination
  set mls rate 0
  set mls cef load-balance source-destination-ip
  set mls cef per-prefix-stats enable
  set mls verify checksum enable
  set mls verify length ip minimum enable
  set mls verify length ip inconsistant enable
  set mls verify length ipx minimum enable
  set mls verify length ipx inconsistant enable
  set mls bridged-flow-statistics disable 1-1000,1025-4094
  set mls nde version 7
  set mls nde destination-ifindex enable
  set mls nde source-ifindex enable
```

```
set mls agingtime long-duration 1920
set mls agingtime 256
set mls agingtime ipx 256
set mls agingtime fast 0 0
set mls nde disable

Supervisor-lcpererroraction
set lcpererroraction ignore

Supervisor-vlan mapping

Supervisor-gmrp
set gmrp disable

Supervisor-garp
set garp timer all 200 600 10000

Supervisor-cdp
set cdp interval 60
set cdp holdtime 180
set cdp enable
set cdp version v2
set cdp format device-id other

Supervisor-cops
set cops retry-interval 30 30 300

Supervisor-acllog
set acllog ratelimit 0

Supervisor-qos
set qos enable
set qos drop-threshold 1q4t rx queue 1 50 60 80 100
set qos map 2q2t tx 1 1 cos 0
set qos map 2q2t tx 1 1 cos 1
set qos map 2q2t tx 1 2 cos 2
set qos map 2q2t tx 2 1 cos 3
set qos map 2q2t tx 2 1 cos 4
set qos map 2q2t tx 2 1 cos 5
set qos map 2q2t tx 2 2 cos 6
set qos map 2q2t tx 2 2 cos 7
set qos drop-threshold 2q2t tx queue 1 80 100
set qos drop-threshold 2q2t tx queue 2 80 100
set qos wrr 2q2t 100 255
set qos txq-ratio 2q2t 80 20
set qos map 1p1q4t rx 1 1 cos 0
set qos map 1p1q4t rx 1 1 cos 1
set qos map 1p1q4t rx 1 2 cos 2
```

```

set qos map lp1q4t rx 1 2 cos 3
set qos map lp1q4t rx 1 3 cos 4
set qos map lp1q4t rx 2 1 cos 5
set qos map lp1q4t rx 1 3 cos 6
set qos map lp1q4t rx 1 4 cos 7
set qos drop-threshold lp1q4t rx queue 1 50 60 80 100
set qos map lp2q2t tx 1 1 cos 0
set qos map lp2q2t tx 1 1 cos 1
set qos map lp2q2t tx 1 2 cos 2
set qos map lp2q2t tx 2 1 cos 3
set qos map lp2q2t tx 2 1 cos 4
set qos map lp2q2t tx 3 1 cos 5
set qos map lp2q2t tx 2 1 cos 6
set qos map lp2q2t tx 2 2 cos 7
set qos wrr lp2q2t 100 255
set qos txq-ratio lp2q2t 70 15 15
set qos wred lp2q2t tx queue 1 40:70 70:100
set qos wred lp2q2t tx queue 2 40:70 70:100
set qos map lp3q1t tx 1 1 cos 0
set qos map lp3q1t tx 1 1 cos 1
set qos map lp3q1t tx 2 1 cos 2
set qos map lp3q1t tx 2 1 cos 3
set qos map lp3q1t tx 2 1 cos 4
set qos map lp3q1t tx 4 1 cos 5
set qos map lp3q1t tx 3 1 cos 6
set qos map lp3q1t tx 3 1 cos 7
set qos wrr lp3q1t 100 150 200
set qos wred lp3q1t tx queue 1 70:100
set qos wred lp3q1t tx queue 2 70:100
set qos wred lp3q1t tx queue 3 70:100
set qos map lp1q0t rx 1 cos 0
set qos map lp1q0t rx 1 cos 1
set qos map lp1q0t rx 1 cos 2
set qos map lp1q0t rx 1 cos 3
set qos map lp1q0t rx 1 cos 4
set qos map lp1q0t rx 2 cos 5
set qos map lp1q0t rx 1 cos 6
set qos map lp1q0t rx 1 cos 7
set qos rxq-ratio lp1q0t 80 20
set qos map lp2q1t tx 1 1 cos 0
set qos map lp2q1t tx 1 1 cos 1
set qos map lp2q1t tx 1 1 cos 2
set qos map lp2q1t tx 1 1 cos 3
set qos map lp2q1t tx 2 1 cos 4
set qos map lp2q1t tx 3 1 cos 5
set qos map lp2q1t tx 2 1 cos 6
set qos map lp2q1t tx 2 1 cos 7
set qos wrr lp2q1t 100 255

```



```
set qos txq-ratio lp2qlt 50 30 20
set qos wred lp2qlt tx queue 1 70:100
set qos wred lp2qlt tx queue 2 70:100
set qos map lp1q8t rx 1 1 cos 0
set qos map lp1q8t rx 1 2 cos 1
set qos map lp1q8t rx 1 3 cos 2
set qos map lp1q8t rx 1 4 cos 3
set qos map lp1q8t rx 1 5 cos 4
set qos map lp1q8t rx 2 1 cos 5
set qos map lp1q8t rx 1 6 cos 6
set qos map lp1q8t rx 1 7 cos 7
set qos rxq-ratio lp1q8t 80 20
set qos wred lp1q8t rx queue 1 40:70 40:70 50:80 50:80 60:90 60:90
70:100 70:100
set qos map lq2t rx 1 1 cos 0
set qos map lq2t rx 1 1 cos 1
set qos map lq2t rx 1 1 cos 2
set qos map lq2t rx 1 1 cos 3
set qos map lq2t rx 1 1 cos 4
set qos map lq2t rx 1 2 cos 5
set qos map lq2t rx 1 2 cos 6
set qos map lq2t rx 1 2 cos 7
set qos drop-threshold lq2t rx queue 1 80 100
set qos bridged-microflow-policing disable 1-1000,1025-4094
set qos cos-dscp-map 0 8 16 26 34 46 48 56
set qos ipprec-dscp-map 0 8 16 26 34 46 48 56
set qos dscp-cos-map 0-7:0
set qos dscp-cos-map 8-15:1
set qos dscp-cos-map 16-23:2
set qos dscp-cos-map 24-31:3
set qos dscp-cos-map 32-39:4
set qos dscp-cos-map 40-47:5
set qos dscp-cos-map 48-55:6
set qos dscp-cos-map 56-63:7
set qos policed-dscp-map 0:0
set qos policed-dscp-map 1:1
set qos policed-dscp-map 2:2
set qos policed-dscp-map 3:3
set qos policed-dscp-map 4:4
set qos policed-dscp-map 5:5
set qos policed-dscp-map 6:6
set qos policed-dscp-map 7:7
set qos policed-dscp-map 8:8
set qos policed-dscp-map 9:9
set qos policed-dscp-map 10:10
set qos policed-dscp-map 11:11
set qos policed-dscp-map 12:12
set qos policed-dscp-map 13:13
```

```
set qos policed-dscp-map 14:14
set qos policed-dscp-map 15:15
set qos policed-dscp-map 16:16
set qos policed-dscp-map 17:17
set qos policed-dscp-map 18:18
set qos policed-dscp-map 19:19
set qos policed-dscp-map 20:20
set qos policed-dscp-map 21:21
set qos policed-dscp-map 22:22
set qos policed-dscp-map 23:23
set qos policed-dscp-map 24:24
set qos policed-dscp-map 25:25
set qos policed-dscp-map 26:26
set qos policed-dscp-map 27:27
set qos policed-dscp-map 28:28
set qos policed-dscp-map 29:29
set qos policed-dscp-map 30:30
set qos policed-dscp-map 31:31
set qos policed-dscp-map 32:32
set qos policed-dscp-map 33:33
set qos policed-dscp-map 34:34
set qos policed-dscp-map 35:35
set qos policed-dscp-map 36:36
set qos policed-dscp-map 37:37
set qos policed-dscp-map 38:38
set qos policed-dscp-map 39:39
set qos policed-dscp-map 40:40
set qos policed-dscp-map 41:41
set qos policed-dscp-map 42:42
set qos policed-dscp-map 43:43
set qos policed-dscp-map 44:44
set qos policed-dscp-map 45:45
set qos policed-dscp-map 46:46
set qos policed-dscp-map 47:47
set qos policed-dscp-map 48:48
set qos policed-dscp-map 49:49
set qos policed-dscp-map 50:50
set qos policed-dscp-map 51:51
set qos policed-dscp-map 52:52
set qos policed-dscp-map 53:53
set qos policed-dscp-map 54:54
set qos policed-dscp-map 55:55
set qos policed-dscp-map 56:56
set qos policed-dscp-map 57:57
set qos policed-dscp-map 58:58
set qos policed-dscp-map 59:59
set qos policed-dscp-map 60:60
set qos policed-dscp-map 61:61
```

```
set qos policed-dscp-map 62:62
set qos policed-dscp-map 63:63
set qos policed-dscp-map excess-rate 0:0
set qos policed-dscp-map excess-rate 1:1
set qos policed-dscp-map excess-rate 2:2
set qos policed-dscp-map excess-rate 3:3
set qos policed-dscp-map excess-rate 4:4
set qos policed-dscp-map excess-rate 5:5
set qos policed-dscp-map excess-rate 6:6
set qos policed-dscp-map excess-rate 7:7
set qos policed-dscp-map excess-rate 8:8
set qos policed-dscp-map excess-rate 9:9
set qos policed-dscp-map excess-rate 10:10
set qos policed-dscp-map excess-rate 11:11
set qos policed-dscp-map excess-rate 12:12
set qos policed-dscp-map excess-rate 13:13
set qos policed-dscp-map excess-rate 14:14
set qos policed-dscp-map excess-rate 15:15
set qos policed-dscp-map excess-rate 16:16
set qos policed-dscp-map excess-rate 17:17
set qos policed-dscp-map excess-rate 18:18
set qos policed-dscp-map excess-rate 19:19
set qos policed-dscp-map excess-rate 20:20
set qos policed-dscp-map excess-rate 21:21
set qos policed-dscp-map excess-rate 22:22
set qos policed-dscp-map excess-rate 23:23
set qos policed-dscp-map excess-rate 24:24
set qos policed-dscp-map excess-rate 25:25
set qos policed-dscp-map excess-rate 26:26
set qos policed-dscp-map excess-rate 27:27
set qos policed-dscp-map excess-rate 28:28
set qos policed-dscp-map excess-rate 29:29
set qos policed-dscp-map excess-rate 30:30
set qos policed-dscp-map excess-rate 31:31
set qos policed-dscp-map excess-rate 32:32
set qos policed-dscp-map excess-rate 33:33
set qos policed-dscp-map excess-rate 34:34
set qos policed-dscp-map excess-rate 35:35
set qos policed-dscp-map excess-rate 36:36
set qos policed-dscp-map excess-rate 37:37
set qos policed-dscp-map excess-rate 38:38
set qos policed-dscp-map excess-rate 39:39
set qos policed-dscp-map excess-rate 40:40
set qos policed-dscp-map excess-rate 41:41
set qos policed-dscp-map excess-rate 42:42
set qos policed-dscp-map excess-rate 43:43
set qos policed-dscp-map excess-rate 44:44
set qos policed-dscp-map excess-rate 45:45
```

```

set qos policed-dscp-map excess-rate 46:46
set qos policed-dscp-map excess-rate 47:47
set qos policed-dscp-map excess-rate 48:48
set qos policed-dscp-map excess-rate 49:49
set qos policed-dscp-map excess-rate 50:50
set qos policed-dscp-map excess-rate 51:51
set qos policed-dscp-map excess-rate 52:52
set qos policed-dscp-map excess-rate 53:53
set qos policed-dscp-map excess-rate 54:54
set qos policed-dscp-map excess-rate 55:55
set qos policed-dscp-map excess-rate 56:56
set qos policed-dscp-map excess-rate 57:57
set qos policed-dscp-map excess-rate 58:58
set qos policed-dscp-map excess-rate 59:59
set qos policed-dscp-map excess-rate 60:60
set qos policed-dscp-map excess-rate 61:61
set qos policed-dscp-map excess-rate 62:62
set qos policed-dscp-map excess-rate 63:63
set qos acl default-action ip dscp 0
set qos acl default-action ipx
set qos acl default-action mac
clear qos acl all

```

Supervisor-ACL_IP-PHONES

```
set qos acl ip ACL_IP-PHONES trust-cos ip any any
```

Supervisor-ACL_TRUST-WAN

```
set qos acl ip ACL_TRUST-WAN trust-ipprec ip any any
```

Supervisor-mmls nonrpf

```
set mmls nonrpf enable
set mmls nonrpf timer 60
set mmls nonrpf window 10
set mmls nonrpf timer 10

```

Supervisor-mmls flow-statistics

```
set mmls flow-statistics timer 20
set mmls flow-statistics threshold 60

```

Supervisor-udld

```
set udld disable
set udld interval 15

```

Supervisor-LACP channel

```
set lacp-channel system-priority 32768

```

Supervisor-channelprotocol

```
set channelprotocol pagg 1

```

```
set channelprotocol pagp 2
set channelprotocol pagp 3
set channelprotocol pagp 4
set channelprotocol pagp 6
```

```
Supervisor-port channel
set port channel 6/1-6 91
set port channel 1/1-2 132
set port channel 3/1-4 136
set port channel 3/5-8 137
set port channel 4/1-4 140
set port channel 4/5-8 141
set port channel 4/9-12 142
set port channel 4/13-16 143
set port channel 4/17-20 144
set port channel 4/21-24 145
set port channel 4/25-28 146
set port channel 4/29-32 147
set port channel 4/33-36 148
set port channel 4/37-40 149
set port channel 4/41-44 150
set port channel 4/45-48 151
set port channel 2/1-2 152
```

```
Supervisor-security ACLs
set security acl arp-inspection match-mac enable
set security acl arp-inspection address-validation enable
set security acl feature ratelimit 500
set security acl log maxflow 500
set security acl log ratelimit 2500
```

```
Supervisor-accounting
set accounting exec disable
set accounting connect disable
set accounting system disable
set accounting commands disable
set accounting suppress null-username disable
set accounting update new-info
```

```
Supervisor-errdisable timeout
set errdisable-timeout disable other
set errdisable-timeout disable uuld
set errdisable-timeout disable duplex-mismatch
set errdisable-timeout disable bpdu-guard
set errdisable-timeout disable channel-misconfig
set errdisable-timeout disable crossbar-fallback
set errdisable-timeout disable packet-buffer-error
set errdisable-timeout disable gl2pt-ingress-loop
```

```

set errdisable-timeout disable gl2pt-threshold-exceed
set errdisable-timeout disable bcast-suppression
set errdisable-timeout disable arp-inspection
set errdisable-timeout interval 300

```

```

Supervisor-http configuration
set ip http server disable
set ip http port 80

```

```
Supervisor-private vlans
```

```
Supervisor-crypto key
```

```

Supervisor-qos statistics data export
set qos statistics export disable
set qos statistics export interval 300

```

```

Supervisor-mmls srm
set mmls srm leak-start 30
set mmls srm purge 120
set mmls srm enable
set mmls srm leak-end 90
set mmls srm batch-size 10

```

```

Supervisor-port security
set port security auto-configure disable

```

```
Supervisor- default port status is enable
```

```

Supervisor-module 1 : 2-port 1000BaseX Supervisor
set module name 1
set vlan 1 1/1-2
set port enable 1/1-2
set port clock 1/1-2 auto
set port trap 1/1-2 enable
set port name 1/1-2
set port security 1/1-2 disable age 0 maximum 1 shutdown 0
unicast-flood enable violation shutdown
set port dot1x 1/1-2 port-control force-authorized
set port dot1x 1/1-2 multiple-host disable
set port dot1x 1/1-2 multiple-authentication disable
set port dot1x 1/1-2 shutdown-timeout disable
set port dot1x 1/1-2 re-authentication disable
set port dot1x 1/1-2 guest-vlan none
set port broadcast 1/1-2 100.00% violation drop-packets multicast
disable unicast disable
set port membership 1/1-2 static
set port protocol 1/1-2 ip on

```

```
set port protocol 1/1-2 ipx auto
set port protocol 1/1-2 group auto
set port negotiation 1/1-2 enable
set port flowcontrol 1/1-2 send desired
set port flowcontrol 1/1-2 receive off
set port vtp 1/1-2 enable
set cdp enable 1/1-2
set udld aggressive-mode disable 1/1-2
clear trunk 1/1 1025-4094
set trunk 1/1 auto negotiate 1-1005
set trunk 1/2 auto negotiate 1-1005,1025-4094
set spantree portfast 1/1-2 default
set spantree bpdu-filter 1/1-2 default
set spantree bpdu-guard 1/1-2 default
set spantree mst link-type 1/1-2 auto
set spantree portpri 1/1-2 32 mst
set spantree portinstancepri 1/1 0 mst
set spantree portinstancepri 1/2 0 mst
set spantree portcost 1/1-2 20000 mst
set spantree portinstancecost 1/1 cost 19999 mst
set spantree portinstancecost 1/2 cost 19999 mst
set spantree portcost 1/1-2 4
set spantree portpri 1/1-2 32
set spantree portvlanpri 1/1 0
set spantree portvlanpri 1/2 0
set spantree portvlancost 1/1 cost 3
set spantree portvlancost 1/2 cost 3
set spantree guard default 1/1-2
set port qos 1/1-2 cos 0
set port qos 1/1-2 trust untrusted
set port qos 1/1-2 port-based
set port qos 1/1-2 policy-source cops
set port rsvp 1/1-2 dsbm-election disable 128
set port gvrp 1/1-2 disable
set gvrp registration normal 1/1-2
set gvrp applicant normal 1/1-2
set port gmrp 1/1-2 enable
set gmrp registration normal 1/1-2
set gmrp fwdall disable 1/1-2
set port jumbo 1/1-2 disable
set port dot1qtunnel 1/1-2 disable
set port dot1q-all-tagged 1/1-2 enable
set port dot1q-ethertype 1/1 8100
set port dot1q-ethertype 1/2 8100
set port l2protocol-tunnel 1/1-2 cdp stp vtp disable
set port l2protocol-tunnel 1/1 drop-threshold 0 shutdown-threshold
```

0

```

set port l2protocol-tunnel 1/2 drop-threshold 0 shutdown-threshold
0
set port arp-inspection 1/1 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 1/2 drop-threshold 0 shutdown-threshold 0
set qos statistics export port 1/1 disable
set qos statistics export port 1/2 disable
set port sync-restart-delay 1/1 210
set port sync-restart-delay 1/2 210
set port debounce 1/1 disable
set port debounce 1/1 delay 10
set port debounce 1/2 disable
set port debounce 1/2 delay 10
set port unicast-flood 1/1-2 enable
set port errdisable-timeout 1/1-2 enable
set cam notification added disable 1/1-2
set cam notification removed disable 1/1-2
set port channel 1/1-2 mode auto silent

Supervisor-module 2 : 2-port 1000BaseX Supervisor
set module name 2
set vlan 1 2/1-2
set port enable 2/1-2
set port clock 2/1-2 auto
set port trap 2/1-2 enable
set port name 2/1-2
set port security 2/1-2 disable age 0 maximum 1 shutdown 0
unicast-flood enable violation shutdown
set port dot1x 2/1-2 port-control force-authorized
set port dot1x 2/1-2 multiple-host disable
set port dot1x 2/1-2 multiple-authentication disable
set port dot1x 2/1-2 shutdown-timeout disable
set port dot1x 2/1-2 re-authentication disable
set port dot1x 2/1-2 guest-vlan none
set port broadcast 2/1-2 100.00% violation drop-packets multicast
disable unicast disable
set port membership 2/1-2 static
set port protocol 2/1-2 ip on
set port protocol 2/1-2 ipx auto
set port protocol 2/1-2 group auto
set port negotiation 2/1-2 enable
set port flowcontrol 2/1-2 send desired
set port flowcontrol 2/1-2 receive off
set port vtp 2/1-2 enable
set cdp enable 2/1-2
set uddl aggressive-mode disable 2/1-2
set trunk 2/1 auto negotiate 1-1005,1025-4094
set trunk 2/2 auto negotiate 1-1005,1025-4094
set spantree portfast 2/1-2 default

```



```
set spantree bpdu-filter 2/1-2 default
set spantree bpdu-guard 2/1-2 default
set spantree mst link-type 2/1-2 auto
set spantree portpri 2/1-2 32 mst
set spantree portinstancepri 2/1 0 mst
set spantree portinstancepri 2/2 0 mst
set spantree portcost 2/1-2 20000 mst
set spantree portinstancecost 2/1 cost 19999 mst
set spantree portinstancecost 2/2 cost 19999 mst
set spantree portcost 2/1-2 4
set spantree portpri 2/1-2 32
set spantree portvlanpri 2/1 0
set spantree portvlanpri 2/2 0
set spantree portvlancost 2/1 cost 3
set spantree portvlancost 2/2 cost 3
set spantree guard default 2/1-2
set port qos 2/1-2 cos 0
set port qos 2/1-2 trust untrusted
set port qos 2/1-2 port-based
set port qos 2/1-2 policy-source cops
set port rsvp 2/1-2 dsbm-election disable 128
set port gvrp 2/1-2 disable
set gvrp registration normal 2/1-2
set gvrp applicant normal 2/1-2
set port gmrp 2/1-2 enable
set gmrp registration normal 2/1-2
set gmrp fwdall disable 2/1-2
set port jumbo 2/1-2 disable
set port dot1qtunnel 2/1-2 disable
set port dot1q-all-tagged 2/1-2 enable
set port dot1q-ethertype 2/1 8100
set port dot1q-ethertype 2/2 8100
set port l2protocol-tunnel 2/1-2 cdp stp vtp disable
set port l2protocol-tunnel 2/1 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 2/2 drop-threshold 0 shutdown-threshold
0
set port arp-inspection 2/1 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 2/2 drop-threshold 0 shutdown-threshold 0
set qos statistics export port 2/1 disable
set qos statistics export port 2/2 disable
set port sync-restart-delay 2/1 210
set port sync-restart-delay 2/2 210
set port debounce 2/1 disable
set port debounce 2/1 delay 10
set port debounce 2/2 disable
set port debounce 2/2 delay 10
set port unicast-flood 2/1-2 enable
```

```

set port errdisable-timeout 2/1-2 enable
set cam notification added disable 2/1-2
set cam notification removed disable 2/1-2
set port channel 2/1-2 mode auto silent

Supervisor-module 3 : 8-port 1000BaseX Ethernet
set module name 3
set module enable 3
set vlan 1 3/6,3/8
set vlan 2 3/1-5,3/7
set port enable 3/1-8
set port clock 3/1-8 auto
set port trap 3/1-8 enable
set port name 3/1 Trunk_to_NS0-CAT5K
set port name 3/2 Trunk_to_NS1-ACS1
set port name 3/3 Trunk_to_NS1-ACS2
set port name 3/4 Trunk_to_NS4-CAT6K
set port name 3/5 Trunk_to_NS0-CAT6K
set port name 3/7 Trunk_to_NS7-CAT6K
set port name 3/6,3/8
set port security 3/1-8 disable age 0 maximum 1 shutdown 0
unicast-flood enable violation shutdown
set port dot1x 3/1-8 port-control force-authorized
set port dot1x 3/1-8 multiple-host disable
set port dot1x 3/1-8 multiple-authentication disable
set port dot1x 3/1-8 shutdown-timeout disable
set port dot1x 3/1-8 re-authentication disable
set port dot1x 3/1-8 guest-vlan none
set port broadcast 3/1-8 100.00% violation drop-packets multicast
disable unicast disable
set port membership 3/1-8 static
set port protocol 3/1-8 ip on
set port protocol 3/1-8 ipx auto
set port protocol 3/1-8 group auto
set port negotiation 3/1-8 enable
set port flowcontrol 3/1-8 send desired
set port flowcontrol 3/1-8 receive off
set port vtp 3/1-8 enable
set cdp enable 3/1-8
set udld enable 3/1-5,3/7
set udld aggressive-mode disable 3/1-8
clear trunk 3/1 11-12
set trunk 3/1 on isl 1-10,13-1005,1025-4094
clear trunk 3/2 11-12
set trunk 3/2 on isl 1-10,13-1005,1025-4094
clear trunk 3/3 11-12
set trunk 3/3 on isl 1-10,13-1005,1025-4094
clear trunk 3/4 11-12,1025-4094

```

```
set trunk 3/4 on isl 1-10,13-1005
clear trunk 3/5 11-12
set trunk 3/5 on isl 1-10,13-1005,1025-4094
set trunk 3/6 auto negotiate 1-1005,1025-4094
clear trunk 3/7 11-12,1025-4094
set trunk 3/7 on isl 1-10,13-1005
set trunk 3/8 auto negotiate 1-1005,1025-4094
set spantree portfast 3/1-8 default
set spantree bpdu-filter 3/1-8 default
set spantree bpdu-guard 3/1-8 default
set spantree mst link-type 3/1-8 auto
set spantree portpri 3/1-8 32 mst
set spantree portinstancepri 3/1 0 mst
set spantree portinstancepri 3/2 0 mst
set spantree portinstancepri 3/3 0 mst
set spantree portinstancepri 3/4 0 mst
set spantree portinstancepri 3/5 0 mst
set spantree portinstancepri 3/6 0 mst
set spantree portinstancepri 3/7 0 mst
set spantree portinstancepri 3/8 0 mst
set spantree portcost 3/1-8 20000 mst
set spantree portinstancecost 3/1 cost 19999 mst
set spantree portinstancecost 3/2 cost 19999 mst
set spantree portinstancecost 3/3 cost 19999 mst
set spantree portinstancecost 3/4 cost 19999 mst
set spantree portinstancecost 3/5 cost 19999 mst
set spantree portinstancecost 3/6 cost 19999 mst
set spantree portinstancecost 3/7 cost 19999 mst
set spantree portinstancecost 3/8 cost 19999 mst
set spantree portcost 3/1-8 4
set spantree portpri 3/1-8 32
set spantree portvlanpri 3/1 0
set spantree portvlanpri 3/2 0
set spantree portvlanpri 3/3 0
set spantree portvlanpri 3/4 0
set spantree portvlanpri 3/5 0
set spantree portvlanpri 3/6 0
set spantree portvlanpri 3/7 0
set spantree portvlanpri 3/8 0
set spantree portvlancost 3/1 cost 3
set spantree portvlancost 3/2 cost 3
set spantree portvlancost 3/3 cost 3
set spantree portvlancost 3/4 cost 3
set spantree portvlancost 3/5 cost 3
set spantree portvlancost 3/6 cost 3
set spantree portvlancost 3/7 cost 3
set spantree portvlancost 3/8 cost 3
set spantree guard default 3/1-8
```

```

set port qos 3/1-8 cos 0
set port qos 3/1-4,3/7 trust trust-ipprec
set port qos 3/5 trust trust-dscp
set port qos 3/6,3/8 trust untrusted
set port qos 3/1,3/4-8 port-based
set port qos 3/2-3 vlan-based
set qos acl map ACL_TRUST-WAN 3/1,3/4-5,3/7
set port qos 3/1-8 policy-source cops
set port rsvp 3/1-8 dsbm-election disable 128
set port gvrp 3/1-8 disable
set gvrp registration normal 3/1-8
set gvrp applicant normal 3/1-8
set port gmrp 3/1-8 enable
set gmrp registration normal 3/1-8
set gmrp fwdall disable 3/1-8
set port jumbo 3/1-8 disable
set port dot1qtunnel 3/1-8 disable
set port dot1q-all-tagged 3/1-8 enable
set port l2protocol-tunnel 3/1-8 cdp stp vtp disable
set port l2protocol-tunnel 3/1 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/2 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/3 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/4 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/5 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/6 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/7 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/8 drop-threshold 0 shutdown-threshold
0
set port arp-inspection 3/1 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/2 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/3 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/4 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/5 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/6 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/7 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/8 drop-threshold 0 shutdown-threshold 0
set qos statistics export port 3/1 disable
set qos statistics export port 3/2 disable
set qos statistics export port 3/3 disable
set qos statistics export port 3/4 disable
set qos statistics export port 3/5 disable

```

```
set qos statistics export port 3/6 disable
set qos statistics export port 3/7 disable
set qos statistics export port 3/8 disable
set port sync-restart-delay 3/1 210
set port sync-restart-delay 3/2 210
set port sync-restart-delay 3/3 210
set port sync-restart-delay 3/4 210
set port sync-restart-delay 3/5 210
set port sync-restart-delay 3/6 210
set port sync-restart-delay 3/7 210
set port sync-restart-delay 3/8 210
set port debounce 3/1 disable
set port debounce 3/1 delay 10
set port debounce 3/2 disable
set port debounce 3/2 delay 10
set port debounce 3/3 disable
set port debounce 3/3 delay 10
set port debounce 3/4 disable
set port debounce 3/4 delay 10
set port debounce 3/5 disable
set port debounce 3/5 delay 10
set port debounce 3/6 disable
set port debounce 3/6 delay 10
set port debounce 3/7 disable
set port debounce 3/7 delay 10
set port debounce 3/8 disable
set port debounce 3/8 delay 10
set port unicast-flood 3/1-8 enable
set port errdisable-timeout 3/1-8 enable
set cam notification added disable 3/1-8
set cam notification removed disable 3/1-8
set port channel 3/1-8 mode auto silent
```

Supervisor-module 4 : 48-port 10/100BaseTX Ethernet

```
set module name 4
set module enable 4
set vlan 1 4/1,4/3-48
set vlan 11 4/2
set port auxiliaryvlan 4/1-48 none
set port qos 4/1-48 trust-ext untrusted
set port qos 4/1-48 cos-ext 0
set port qos 4/1-48 trust-device none
set port enable 4/1-48
set port speed 4/3-43,4/45-46 auto
set port speed 4/1-2,4/44,4/47-48 100
set port duplex 4/2,4/44,4/47-48 full
set port duplex 4/1 half
set port trap 4/1-48 enable
```

```

set port name          4/1  to_CCIE_Testbed
set port name          4/2  FWSM_outside_to_7206
set port name          4/44 trunk_to_NS3-CAT6K
set port name          4/47 Trunk_to_NS0-CAT5K
set port name          4/48 Trunk_to_NS1-7206
set port name          4/3-43,4/45-46
set port security 4/1-48 disable age 0 maximum 1 shutdown 0
unicast-flood enable violation shutdown
set port dot1x 4/1-48 port-control force-authorized
set port dot1x 4/1-48 multiple-host disable
set port dot1x 4/1-48 multiple-authentication disable
set port dot1x 4/1-48 shutdown-timeout disable
set port dot1x 4/1-48 re-authentication disable
set port dot1x 4/1-48 guest-vlan none
set port broadcast 4/1-48 100.00% violation drop-packets
set port membership 4/1-48 static
set port protocol 4/1-48 ip on
set port protocol 4/1-48 ipx auto
set port protocol 4/1-48 group auto
set port flowcontrol 4/1-48 send off
set port flowcontrol 4/1-48 receive off
set port vtp 4/1-48 enable
set cdp enable 4/1-48
set udld disable 4/1-48
set udld aggressive-mode disable 4/1-48
clear trunk 4/1 1-150,152-1005
set trunk 4/1 auto dot1q 151,1025-4094
clear trunk 4/2 12
set trunk 4/2 auto negotiate 1-11,13-1005,1025-4094
set trunk 4/3 auto negotiate 1-1005,1025-4094
set trunk 4/4 auto negotiate 1-1005,1025-4094
set trunk 4/5 auto negotiate 1-1005,1025-4094
set trunk 4/6 auto negotiate 1-1005,1025-4094
set trunk 4/7 auto negotiate 1-1005,1025-4094
set trunk 4/8 auto negotiate 1-1005,1025-4094
set trunk 4/9 auto negotiate 1-1005,1025-4094
set trunk 4/10 auto negotiate 1-1005,1025-4094
set trunk 4/11 auto negotiate 1-1005,1025-4094
set trunk 4/12 auto negotiate 1-1005,1025-4094
set trunk 4/13 auto negotiate 1-1005,1025-4094
set trunk 4/14 auto negotiate 1-1005,1025-4094
set trunk 4/15 auto negotiate 1-1005,1025-4094
set trunk 4/16 auto negotiate 1-1005,1025-4094
set trunk 4/17 auto negotiate 1-1005,1025-4094
set trunk 4/18 auto negotiate 1-1005,1025-4094
set trunk 4/19 auto negotiate 1-1005,1025-4094
set trunk 4/20 auto negotiate 1-1005,1025-4094
set trunk 4/21 auto negotiate 1-1005,1025-4094

```

```
set trunk 4/22 auto negotiate 1-1005,1025-4094
set trunk 4/23 auto negotiate 1-1005,1025-4094
set trunk 4/24 auto negotiate 1-1005,1025-4094
set trunk 4/25 auto negotiate 1-1005,1025-4094
set trunk 4/26 auto negotiate 1-1005,1025-4094
set trunk 4/27 auto negotiate 1-1005,1025-4094
set trunk 4/28 auto negotiate 1-1005,1025-4094
set trunk 4/29 auto negotiate 1-1005,1025-4094
set trunk 4/30 auto negotiate 1-1005,1025-4094
set trunk 4/31 auto negotiate 1-1005,1025-4094
set trunk 4/32 auto negotiate 1-1005,1025-4094
set trunk 4/33 auto negotiate 1-1005,1025-4094
set trunk 4/34 auto negotiate 1-1005,1025-4094
set trunk 4/35 auto negotiate 1-1005,1025-4094
set trunk 4/36 auto negotiate 1-1005,1025-4094
set trunk 4/37 auto negotiate 1-1005,1025-4094
set trunk 4/38 auto negotiate 1-1005,1025-4094
set trunk 4/39 auto negotiate 1-1005,1025-4094
set trunk 4/40 auto negotiate 1-1005,1025-4094
set trunk 4/41 auto negotiate 1-1005,1025-4094
set trunk 4/42 auto negotiate 1-1005,1025-4094
set trunk 4/43 auto negotiate 1-1005,1025-4094
clear trunk 4/44 3-29,31-306,309-800,802-803,805-887,889-1005
set trunk 4/44 on isl 1-2,30,307-308,801,804,888,1025-4094
set trunk 4/45 auto negotiate 1-1005,1025-4094
set trunk 4/46 auto negotiate 1-1005,1025-4094
clear trunk 4/47 11-12,1025-4094
set trunk 4/47 auto negotiate 1-10,13-1005
clear trunk 4/48 11-12,1025-4094
set trunk 4/48 on dot1q 1-10,13-1005
set spantree portfast 4/1-48 default
set spantree bpdu-filter 4/1-48 default
set spantree bpdu-guard 4/1-48 default
set spantree mst link-type 4/1-48 auto
set spantree portpri 4/1-48 32 mst
set spantree portinstancepri 4/1 0 mst
set spantree portinstancepri 4/2 0 mst
set spantree portinstancepri 4/3 0 mst
set spantree portinstancepri 4/4 0 mst
set spantree portinstancepri 4/5 0 mst
set spantree portinstancepri 4/6 0 mst
set spantree portinstancepri 4/7 0 mst
set spantree portinstancepri 4/8 0 mst
set spantree portinstancepri 4/9 0 mst
set spantree portinstancepri 4/10 0 mst
set spantree portinstancepri 4/11 0 mst
set spantree portinstancepri 4/12 0 mst
set spantree portinstancepri 4/13 0 mst
```

```

set spantree portinstancepri 4/14 0 mst
set spantree portinstancepri 4/15 0 mst
set spantree portinstancepri 4/16 0 mst
set spantree portinstancepri 4/17 0 mst
set spantree portinstancepri 4/18 0 mst
set spantree portinstancepri 4/19 0 mst
set spantree portinstancepri 4/20 0 mst
set spantree portinstancepri 4/21 0 mst
set spantree portinstancepri 4/22 0 mst
set spantree portinstancepri 4/23 0 mst
set spantree portinstancepri 4/24 0 mst
set spantree portinstancepri 4/25 0 mst
set spantree portinstancepri 4/26 0 mst
set spantree portinstancepri 4/27 0 mst
set spantree portinstancepri 4/28 0 mst
set spantree portinstancepri 4/29 0 mst
set spantree portinstancepri 4/30 0 mst
set spantree portinstancepri 4/31 0 mst
set spantree portinstancepri 4/32 0 mst
set spantree portinstancepri 4/33 0 mst
set spantree portinstancepri 4/34 0 mst
set spantree portinstancepri 4/35 0 mst
set spantree portinstancepri 4/36 0 mst
set spantree portinstancepri 4/37 0 mst
set spantree portinstancepri 4/38 0 mst
set spantree portinstancepri 4/39 0 mst
set spantree portinstancepri 4/40 0 mst
set spantree portinstancepri 4/41 0 mst
set spantree portinstancepri 4/42 0 mst
set spantree portinstancepri 4/43 0 mst
set spantree portinstancepri 4/44 0 mst
set spantree portinstancepri 4/45 0 mst
set spantree portinstancepri 4/46 0 mst
set spantree portinstancepri 4/47 0 mst
set spantree portinstancepri 4/48 0 mst
set spantree portcost 4/1-2,4/44-45,4/47-48 200000 mst
set spantree portcost 4/3-43,4/46 2000000 mst
set spantree portinstancecost 4/1 cost 199999 mst
set spantree portinstancecost 4/2 cost 199999 mst
set spantree portinstancecost 4/3 cost 1999999 mst
set spantree portinstancecost 4/4 cost 1999999 mst
set spantree portinstancecost 4/5 cost 1999999 mst
set spantree portinstancecost 4/6 cost 1999999 mst
set spantree portinstancecost 4/7 cost 1999999 mst
set spantree portinstancecost 4/8 cost 1999999 mst
set spantree portinstancecost 4/9 cost 1999999 mst
set spantree portinstancecost 4/10 cost 1999999 mst
set spantree portinstancecost 4/11 cost 1999999 mst

```



```
set spantree portinstancecost 4/12 cost 1999999 mst
set spantree portinstancecost 4/13 cost 1999999 mst
set spantree portinstancecost 4/14 cost 1999999 mst
set spantree portinstancecost 4/15 cost 1999999 mst
set spantree portinstancecost 4/16 cost 1999999 mst
set spantree portinstancecost 4/17 cost 1999999 mst
set spantree portinstancecost 4/18 cost 1999999 mst
set spantree portinstancecost 4/19 cost 1999999 mst
set spantree portinstancecost 4/20 cost 1999999 mst
set spantree portinstancecost 4/21 cost 1999999 mst
set spantree portinstancecost 4/22 cost 1999999 mst
set spantree portinstancecost 4/23 cost 1999999 mst
set spantree portinstancecost 4/24 cost 1999999 mst
set spantree portinstancecost 4/25 cost 1999999 mst
set spantree portinstancecost 4/26 cost 1999999 mst
set spantree portinstancecost 4/27 cost 1999999 mst
set spantree portinstancecost 4/28 cost 1999999 mst
set spantree portinstancecost 4/29 cost 1999999 mst
set spantree portinstancecost 4/30 cost 1999999 mst
set spantree portinstancecost 4/31 cost 1999999 mst
set spantree portinstancecost 4/32 cost 1999999 mst
set spantree portinstancecost 4/33 cost 1999999 mst
set spantree portinstancecost 4/34 cost 1999999 mst
set spantree portinstancecost 4/35 cost 1999999 mst
set spantree portinstancecost 4/36 cost 1999999 mst
set spantree portinstancecost 4/37 cost 1999999 mst
set spantree portinstancecost 4/38 cost 1999999 mst
set spantree portinstancecost 4/39 cost 1999999 mst
set spantree portinstancecost 4/40 cost 1999999 mst
set spantree portinstancecost 4/41 cost 1999999 mst
set spantree portinstancecost 4/42 cost 1999999 mst
set spantree portinstancecost 4/43 cost 1999999 mst
set spantree portinstancecost 4/44 cost 199999 mst
set spantree portinstancecost 4/45 cost 1999999 mst
set spantree portinstancecost 4/46 cost 1999999 mst
set spantree portinstancecost 4/47 cost 199999 mst
set spantree portinstancecost 4/48 cost 199999 mst
set spantree portcost 4/1-2,4/44-45,4/47-48 19
set spantree portcost 4/3-43,4/46 100
set spantree portpri 4/1-48 32
set spantree portvlanpri 4/1 0
set spantree portvlanpri 4/2 0
set spantree portvlanpri 4/3 0
set spantree portvlanpri 4/4 0
set spantree portvlanpri 4/5 0
set spantree portvlanpri 4/6 0
set spantree portvlanpri 4/7 0
set spantree portvlanpri 4/8 0
```

```
set spantree portvlanpri 4/9 0
set spantree portvlanpri 4/10 0
set spantree portvlanpri 4/11 0
set spantree portvlanpri 4/12 0
set spantree portvlanpri 4/13 0
set spantree portvlanpri 4/14 0
set spantree portvlanpri 4/15 0
set spantree portvlanpri 4/16 0
set spantree portvlanpri 4/17 0
set spantree portvlanpri 4/18 0
set spantree portvlanpri 4/19 0
set spantree portvlanpri 4/20 0
set spantree portvlanpri 4/21 0
set spantree portvlanpri 4/22 0
set spantree portvlanpri 4/23 0
set spantree portvlanpri 4/24 0
set spantree portvlanpri 4/25 0
set spantree portvlanpri 4/26 0
set spantree portvlanpri 4/27 0
set spantree portvlanpri 4/28 0
set spantree portvlanpri 4/29 0
set spantree portvlanpri 4/30 0
set spantree portvlanpri 4/31 0
set spantree portvlanpri 4/32 0
set spantree portvlanpri 4/33 0
set spantree portvlanpri 4/34 0
set spantree portvlanpri 4/35 0
set spantree portvlanpri 4/36 0
set spantree portvlanpri 4/37 0
set spantree portvlanpri 4/38 0
set spantree portvlanpri 4/39 0
set spantree portvlanpri 4/40 0
set spantree portvlanpri 4/41 0
set spantree portvlanpri 4/42 0
set spantree portvlanpri 4/43 0
set spantree portvlanpri 4/44 0
set spantree portvlanpri 4/45 0
set spantree portvlanpri 4/46 0
set spantree portvlanpri 4/47 0
set spantree portvlanpri 4/48 0
set spantree portvlancost 4/1 cost 18
set spantree portvlancost 4/2 cost 18
set spantree portvlancost 4/3 cost 99
set spantree portvlancost 4/4 cost 99
set spantree portvlancost 4/5 cost 99
set spantree portvlancost 4/6 cost 99
set spantree portvlancost 4/7 cost 99
set spantree portvlancost 4/8 cost 99
```

```
set spantree portvlancost 4/9 cost 99
set spantree portvlancost 4/10 cost 99
set spantree portvlancost 4/11 cost 99
set spantree portvlancost 4/12 cost 99
set spantree portvlancost 4/13 cost 99
set spantree portvlancost 4/14 cost 99
set spantree portvlancost 4/15 cost 99
set spantree portvlancost 4/16 cost 99
set spantree portvlancost 4/17 cost 99
set spantree portvlancost 4/18 cost 99
set spantree portvlancost 4/19 cost 99
set spantree portvlancost 4/20 cost 99
set spantree portvlancost 4/21 cost 99
set spantree portvlancost 4/22 cost 99
set spantree portvlancost 4/23 cost 99
set spantree portvlancost 4/24 cost 99
set spantree portvlancost 4/25 cost 99
set spantree portvlancost 4/26 cost 99
set spantree portvlancost 4/27 cost 99
set spantree portvlancost 4/28 cost 99
set spantree portvlancost 4/29 cost 99
set spantree portvlancost 4/30 cost 99
set spantree portvlancost 4/31 cost 99
set spantree portvlancost 4/32 cost 99
set spantree portvlancost 4/33 cost 99
set spantree portvlancost 4/34 cost 99
set spantree portvlancost 4/35 cost 99
set spantree portvlancost 4/36 cost 99
set spantree portvlancost 4/37 cost 99
set spantree portvlancost 4/38 cost 99
set spantree portvlancost 4/39 cost 99
set spantree portvlancost 4/40 cost 99
set spantree portvlancost 4/41 cost 99
set spantree portvlancost 4/42 cost 99
set spantree portvlancost 4/43 cost 99
set spantree portvlancost 4/44 cost 18
set spantree portvlancost 4/45 cost 18
set spantree portvlancost 4/46 cost 99
set spantree portvlancost 4/47 cost 18
set spantree portvlancost 4/48 cost 18
set spantree guard default 4/1-48
set port qos 4/1-48 cos 0
set port qos 4/48 trust trust-cos
set port qos 4/1-47 trust untrusted
set port qos 4/1-46,4/48 port-based
set port qos 4/47 vlan-based
set port qos 4/1-48 policy-source cops
set port rsvp 4/1-48 dsbm-election disable 128
```

```
set port gvrp 4/1-48 disable
set gvrp registration normal 4/1-48
set gvrp applicant normal 4/1-48
set port gmrp 4/1-48 enable
set gmrp registration normal 4/1-48
set gmrp fwdall disable 4/1-48
set port jumbo 4/1-48 disable
set port dot1qtunnel 4/1-48 disable
set port dot1q-all-tagged 4/1-48 enable
set port l2protocol-tunnel 4/1-48 cdp stp vtp disable
set port l2protocol-tunnel 4/1 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/2 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/3 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/4 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/5 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/6 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/7 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/8 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/9 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/10 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/11 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/12 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/13 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/14 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/15 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/16 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/17 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/18 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/19 drop-threshold 0 shutdown-threshold
0
```

```
set port l2protocol-tunnel 4/20 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/21 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/22 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/23 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/24 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/25 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/26 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/27 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/28 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/29 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/30 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/31 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/32 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/33 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/34 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/35 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/36 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/37 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/38 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/39 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/40 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/41 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/42 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/43 drop-threshold 0 shutdown-threshold
0
```

```

set port l2protocol-tunnel 4/44 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/45 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/46 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/47 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 4/48 drop-threshold 0 shutdown-threshold
0
set port arp-inspection 4/1 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/2 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/3 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/4 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/5 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/6 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/7 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/8 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/9 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/10 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/11 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/12 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/13 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/14 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/15 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/16 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/17 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/18 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/19 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/20 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/21 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/22 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/23 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/24 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/25 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/26 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/27 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/28 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/29 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/30 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/31 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/32 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/33 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/34 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/35 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/36 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/37 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/38 drop-threshold 0 shutdown-threshold 0

```

```
set port arp-inspection 4/39 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/40 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/41 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/42 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/43 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/44 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/45 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/46 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/47 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/48 drop-threshold 0 shutdown-threshold 0
set qos statistics export port 4/1 disable
set qos statistics export port 4/2 disable
set qos statistics export port 4/3 disable
set qos statistics export port 4/4 disable
set qos statistics export port 4/5 disable
set qos statistics export port 4/6 disable
set qos statistics export port 4/7 disable
set qos statistics export port 4/8 disable
set qos statistics export port 4/9 disable
set qos statistics export port 4/10 disable
set qos statistics export port 4/11 disable
set qos statistics export port 4/12 disable
set qos statistics export port 4/13 disable
set qos statistics export port 4/14 disable
set qos statistics export port 4/15 disable
set qos statistics export port 4/16 disable
set qos statistics export port 4/17 disable
set qos statistics export port 4/18 disable
set qos statistics export port 4/19 disable
set qos statistics export port 4/20 disable
set qos statistics export port 4/21 disable
set qos statistics export port 4/22 disable
set qos statistics export port 4/23 disable
set qos statistics export port 4/24 disable
set qos statistics export port 4/25 disable
set qos statistics export port 4/26 disable
set qos statistics export port 4/27 disable
set qos statistics export port 4/28 disable
set qos statistics export port 4/29 disable
set qos statistics export port 4/30 disable
set qos statistics export port 4/31 disable
set qos statistics export port 4/32 disable
set qos statistics export port 4/33 disable
set qos statistics export port 4/34 disable
set qos statistics export port 4/35 disable
set qos statistics export port 4/36 disable
set qos statistics export port 4/37 disable
set qos statistics export port 4/38 disable
```

```
set qos statistics export port 4/39 disable
set qos statistics export port 4/40 disable
set qos statistics export port 4/41 disable
set qos statistics export port 4/42 disable
set qos statistics export port 4/43 disable
set qos statistics export port 4/44 disable
set qos statistics export port 4/45 disable
set qos statistics export port 4/46 disable
set qos statistics export port 4/47 disable
set qos statistics export port 4/48 disable
set port debounce 4/1 disable
set port debounce 4/2 disable
set port debounce 4/3 disable
set port debounce 4/4 disable
set port debounce 4/5 disable
set port debounce 4/6 disable
set port debounce 4/7 disable
set port debounce 4/8 disable
set port debounce 4/9 disable
set port debounce 4/10 disable
set port debounce 4/11 disable
set port debounce 4/12 disable
set port debounce 4/13 disable
set port debounce 4/14 disable
set port debounce 4/15 disable
set port debounce 4/16 disable
set port debounce 4/17 disable
set port debounce 4/18 disable
set port debounce 4/19 disable
set port debounce 4/20 disable
set port debounce 4/21 disable
set port debounce 4/22 disable
set port debounce 4/23 disable
set port debounce 4/24 disable
set port debounce 4/25 disable
set port debounce 4/26 disable
set port debounce 4/27 disable
set port debounce 4/28 disable
set port debounce 4/29 disable
set port debounce 4/30 disable
set port debounce 4/31 disable
set port debounce 4/32 disable
set port debounce 4/33 disable
set port debounce 4/34 disable
set port debounce 4/35 disable
set port debounce 4/36 disable
set port debounce 4/37 disable
set port debounce 4/38 disable
```



```

set port debounce 4/39 disable
set port debounce 4/40 disable
set port debounce 4/41 disable
set port debounce 4/42 disable
set port debounce 4/43 disable
set port debounce 4/44 disable
set port debounce 4/45 disable
set port debounce 4/46 disable
set port debounce 4/47 disable
set port debounce 4/48 disable
set port unicast-flood 4/1-48 enable
set port errdisable-timeout 4/1-48 enable
set cam notification added disable 4/1-48
set cam notification removed disable 4/1-48
set port channel 4/1-48 mode auto silent

Supervisor-module 5 : 8-port T1
  set module name      5      CCIE_Voice
  set module enable    5
  set port voice interface 5/1 dhcp enable vlan 151
  set port voice interface 5/2 dhcp enable vlan 151
  set port voice interface 5/3 dhcp enable vlan 151
  set port voice interface 5/4 dhcp enable vlan 151
  set port voice interface 5/5 dhcp enable vlan 151
  set port voice interface 5/6 dhcp disable 10.12.18.52
255.255.255.224 vlan 151 tftp 10.12.18.36 gateway 10.12.18.33 dns
10.12.18.2 voice.local
  set port voice interface 5/7 dhcp disable 10.12.18.53
255.255.255.224 vlan 151 tftp 10.12.18.36 gateway 10.12.18.33 dns
10.12.18.2 voice.local
  set port voice interface 5/8 dhcp disable 10.12.18.54
255.255.255.224 vlan 151 tftp 10.12.18.36 gateway 10.12.18.33 dns
10.12.18.2 voice.local
  set port enable      5/1-8
  set port trap         5/1-8 enable
  set port name         5/1 CCIE_VOICE_TRUNK 5/1
  set port name         5/2 CCIE_VOICE_TRUNK 5/2
  set port name         5/3 CCIE_VOICE_TRUNK 5/3
  set port name         5/4 CCIE_VOICE_TRUNK 5/4
  set port name         5/5 CCIE_VOICE_TRUNK 5/5
  set port name         5/6 HQ_Transcoder
  set port name         5/7 HQ_CB
  set port name         5/8 CCIE_VOICE_TRUNK
  set spantree guard default 5/1-8
  set port jumbo 5/1-8 disable
  set cam notification added disable 5/1-8
  set cam notification removed disable 5/1-8

```

```

Supervisor-module 6 : 6-port Firewall Module
  set module name      6
  set module enable    6
  set port name        6/1-6
  set vlan 11-12 firewall-vlan 6
  set spantree portfast 6/1-6 enable trunk
  set spantree bpdu-filter 6/1-6 default
  set spantree bpdu-guard 6/1-6 disable
  set spantree portpri 6/1-6 32 mst
  set spantree portinstancepri 6/1 0 mst
  set spantree portinstancepri 6/2 0 mst
  set spantree portinstancepri 6/3 0 mst
  set spantree portinstancepri 6/4 0 mst
  set spantree portinstancepri 6/5 0 mst
  set spantree portinstancepri 6/6 0 mst
  set spantree portvlanpri 6/1 0
  set spantree portvlanpri 6/2 0
  set spantree portvlanpri 6/3 0
  set spantree portvlanpri 6/4 0
  set spantree portvlanpri 6/5 0
  set spantree portvlanpri 6/6 0
  set cam notification added disable 6/1-6
  set cam notification removed disable 6/1-6
  set port channel 6/1-6 mode on

Supervisor-module 15 : 1-port Multilayer Switch Feature Card
  set module name      15
  set module enable    15
  set vlan 1          15/1
  set port name        15/1
  set port vtp 15/1 enable
  set cdp enable       15/1
  set trunk 15/1 nonegotiate isl 1-1005,1025-4094
  set spantree portcost 15/1 20000 mst
  set spantree portinstancecost 15/1 cost 19999 mst
  set spantree portcost 15/1 4
  set spantree portpri 15/1 32
  set spantree portvlanpri 15/1 0
  set spantree portvlancost 15/1 cost 3
  set spantree guard default 15/1
  set port gmrp 15/1 enable
  set gmrp registration normal 15/1
  set gmrp fwdall disable 15/1
  set port jumbo 15/1 disable
  set cam notification added disable 15/1
  set cam notification removed disable 15/1

Supervisor-module 16 empty

```

```
Supervisor-switch port analyzer
  set rspan source 4/48 888 both multicast enable create
  set rspan destination 4/45 888 inpkts disable learning enable
  create

Supervisor-cam
  set cam agingtime
1-2,10-12,98,101-110,113-114,151,164,204-205,307-308,401-405,408-410,5
04-505,604-605,701-707,801,803-804,888,901,904 300
  set cam notification disable
  set cam notification interval 300
  set cam notification historysize 1
  set cam notification threshold disable
  set cam notification threshold limit 50
  set cam notification threshold interval 300
  set cam notification move disable

Supervisor-gvrp
  set gvrp dynamic-vlan-creation disable
  set gvrp disable

Supervisor-vlan verify-port-provisioning
  set vlan verify-port-provisioning disable

Supervisor-authorization
  set authorization exec disable console
  set authorization exec disable telnet
  set authorization enable disable console
  set authorization enable disable telnet
  set authorization commands disable console
  set authorization commands disable telnet

MODULE 15

MODULE 15-MODULE15-Global
  ! No configuration change since last restart
  version 12.1
  service nagle
  no service pad
  service timestamps debug datetime msec localtime
  service timestamps log datetime msec localtime
  service password-encryption
  hostname NS1-CORE1
  boot system bootflash:c6msfc2-psv-mz.121-19.E1.bin
  logging buffered 262144 debugging
  no logging console
  clock timezone US_Eastern -5
```

```

clock summer-time US_EDT recurring
mls rp ip
tftp-server bootflash:c6msfc2-psv-mz.121-13.E6
banner motd "
GB-IPCC Test. Contact gb-ipcc@cisco.com
"

alias configure ro router ospf
alias exec c conf t
alias exec ipr sh ip route
alias exec ciop clear ip ospf process
alias exec clog clear logg
alias exec sion sh ip ospf neighbor
alias exec sip sh ip protocols
alias exec cipr clear ip route *
alias exec sib sh ip int brief
exception protocol ftp
exception dump 10.12.13.212
ntp clock-period 17180009
ntp update-calendar
ntp server 10.12.2.1
ticast-routing
mls rp ip

MODULE 15-MODULE15-IP

MODULE 15-MODULE15-IP-IP Global
ip subnet-zero
no ip source-route
ip ftp username nsite
ip ftp password 7 011F07061B
ip domain-name ipcc.com
ip name-server 10.12.3.72
ip name-server 10.12.7.47
ip multicast-routing
ip classless
ip route 10.12.8.0 255.255.255.0 10.12.3.106
ip route 10.12.11.0 255.255.255.0 10.12.3.106
ip route 10.12.13.0 255.255.255.0 10.12.2.1
ip route 172.0.0.0 255.0.0.0 10.12.2.1
ip route 172.18.0.0 255.255.0.0 10.12.2.1
no ip http server
ip ospf name-lookup
ip classless
ip route 10.12.8.0 255.255.255.0 10.12.3.106
ip route 10.12.11.0 255.255.255.0 10.12.3.106
ip route 10.12.13.0 255.255.255.0 10.12.2.1
ip route 172.0.0.0 255.0.0.0 10.12.2.1
ip route 172.18.0.0 255.255.0.0 10.12.2.1

```

```
no ip http server
ip ospf name-lookup

MODULE 15-MODULE15-IP-IP dhcp pool NS1_phones
ip dhcp pool NS1_phones
network 10.12.3.224 255.255.255.224
option 150 ip 10.12.3.2
default-router 10.12.3.225
domain-name ipcc.com
dns-server 10.12.3.72 10.12.7.47

MODULE 15-MODULE15-IP-IP AccessList extended BLOCK_RTP
ip access-list extended BLOCK_RTP
deny udp any any range 16383 16384
permit ip any any

MODULE 15-MODULE15-IP-IP AccessList extend
ip access-list extend

MODULE 15-MODULE15-Interface

MODULE 15-MODULE15-Interface-Interface Loopback0
interface Loopback0
description router-id for ospf
ip address 200.0.0.10 255.255.255.255
interface Loopback0
description router-id for ospf
ip address 200.0.0.10 255.255.255.255

MODULE 15-MODULE15-Interface-Interface Vlan1
interface Vlan1
no ip address
no ip redirects
no ip unreachableables
interface Vlan1
no ip address
no ip redirects
no ip unreachableables

MODULE 15-MODULE15-Interface-Interface Vlan2
interface Vlan2
description Management VLAN
ip address 10.12.2.6 255.255.255.224
no ip redirects
no ip unreachableables
ip ospf priority 200
load-interval 30
mls rp ip
```

```
interface Vlan2
description Management VLAN
ip address 10.12.2.6 255.255.255.224
no ip redirects
no ip unreachablees
ip ospf priority 200
load-interval 30
mls rp ip

MODULE 15-MODULE15-Interface-Interface Vlan10
interface Vlan10
description Trunk to ns1-3725 VLAN
ip address 10.12.3.97 255.255.255.252
no ip redirects
no ip unreachablees
ip ospf priority 0
interface Vlan10
description Trunk to ns1-3725 VLAN
ip address 10.12.3.97 255.255.255.252
no ip redirects
no ip unreachablees
ip ospf priority 0

MODULE 15-MODULE15-Interface-Interface Vlan12
interface Vlan12
description Firewall VLAN
ip address 10.12.3.105 255.255.255.252
interface Vlan12
description Firewall VLAN
ip address 10.12.3.105 255.255.255.252

MODULE 15-MODULE15-Interface-Interface Vlan101
interface Vlan101
description CM VLAN for ACS1
ip address 10.12.3.1 255.255.255.240
no ip redirects
no ip unreachablees
interface Vlan101
description CM VLAN for ACS1
ip address 10.12.3.1 255.255.255.240
no ip redirects
no ip unreachablees

MODULE 15-MODULE15-Interface-Interface Vlan102
interface Vlan102
description CM VLAN for ACS2
ip address 10.12.3.17 255.255.255.240
no ip redirects
```

```
no ip unreachable
interface Vlan102
description CM VLAN for ACS2
ip address 10.12.3.17 255.255.255.240
no ip redirects
no ip unreachable

MODULE 15-MODULE15-Interface-Interface Vlan103
interface Vlan103
description Simclient VLAN for ACS1
ip address 10.12.3.33 255.255.255.248
ip access-group BLOCK_RTP out
no ip redirects
no ip unreachable
interface Vlan103
description Simclient VLAN for ACS1
ip address 10.12.3.33 255.255.255.248
ip access-group BLOCK_RTP out
no ip redirects
no ip unreachable

MODULE 15-MODULE15-Interface-Interface Vlan104
interface Vlan104
description Simclient VLAN for ACS2
ip address 10.12.3.41 255.255.255.248
ip access-group BLOCK_RTP out
no ip redirects
no ip unreachable
interface Vlan104
description Simclient VLAN for ACS2
ip address 10.12.3.41 255.255.255.248
ip access-group BLOCK_RTP out
no ip redirects
no ip unreachable

MODULE 15-MODULE15-Interface-Interface Vlan105
interface Vlan105
description Ciltest VLAN for ACS1
ip address 10.12.3.49 255.255.255.248
no ip redirects
no ip unreachable
interface Vlan105
description Ciltest VLAN for ACS1
ip address 10.12.3.49 255.255.255.248
no ip redirects
no ip unreachable

MODULE 15-MODULE15-Interface-Interface Vlan106
```

```
interface Vlan106
description Ciltest VLAN for ACS2
ip address 10.12.3.57 255.255.255.248
no ip redirects
no ip unreachablees
interface Vlan106
description Ciltest VLAN for ACS2
ip address 10.12.3.57 255.255.255.248
no ip redirects
no ip unreachablees

MODULE 15-MODULE15-Interface-Interface Vlan107
interface Vlan107
description ICM VLAN for ACS1
ip address 10.12.3.65 255.255.255.240
no ip redirects
no ip unreachablees
interface Vlan107
description ICM VLAN for ACS1
ip address 10.12.3.65 255.255.255.240
no ip redirects
no ip unreachablees

MODULE 15-MODULE15-Interface-Interface Vlan108
interface Vlan108
description ICM VLAN for ACS2
ip address 10.12.3.81 255.255.255.240
no ip redirects
no ip unreachablees
interface Vlan108
description ICM VLAN for ACS2
ip address 10.12.3.81 255.255.255.240
no ip redirects
no ip unreachablees

MODULE 15-MODULE15-Interface-Interface Vlan109
interface Vlan109
description NS1 GK/CSA VLAN for ACS1
ip address 10.12.3.129 255.255.255.224
no ip redirects
no ip unreachablees
interface Vlan109
description NS1 GK/CSA VLAN for ACS1
ip address 10.12.3.129 255.255.255.224
no ip redirects
no ip unreachablees

MODULE 15-MODULE15-Interface-Interface Vlan110
```



```
interface Vlan110
description GK VLAN for ACS2
ip address 10.12.3.161 255.255.255.224
no ip redirects
no ip unreachablees
interface Vlan110
description GK VLAN for ACS2
ip address 10.12.3.161 255.255.255.224
no ip redirects
no ip unreachablees

MODULE 15-MODULE15-Interface-Interface Vlan113
interface Vlan113
description NS1 Desktop Vlan (NS0-CAT6K)
ip address 10.12.3.193 255.255.255.240
no ip redirects
no ip unreachablees
interface Vlan113
description NS1 Desktop Vlan (NS0-CAT6K)
ip address 10.12.3.193 255.255.255.240
no ip redirects
no ip unreachablees

MODULE 15-MODULE15-Interface-Interface Vlan114
interface Vlan114
description IP Phone VLAN
ip address 10.12.3.225 255.255.255.224
no ip redirects
no ip unreachablees
interface Vlan114
description IP Phone VLAN
ip address 10.12.3.225 255.255.255.224
no ip redirects
no ip unreachablees

MODULE 15-MODULE15-Interface-Interface Vlan151
interface Vlan151
no ip address
ip helper-address 10.12.18.2
interface Vlan151
no ip address
ip helper-address 10.12.18.2

MODULE 15-MODULE15-IP Routing

MODULE 15-MODULE15-IP Routing-Routing ospf 1
router ospf 1
router-id 200.0.0.10
```

```

log-adjacency-changes
summary-address 10.12.13.0 255.255.255.0
redistribute static
network 10.12.3.0 0.0.0.255 area 1
router ospf 1
router-id 200.0.0.10
log-adjacency-changes
summary-address 10.12.13.0 255.255.255.0
redistribute static
network 10.12.3.0 0.0.0.255 area 1

MODULE 15-SNMP
snmp-server community*****
snmp-server community*****
snmp-server system-shutdown
snmp-server enable traps snmp authentication warmstart linkdown
linkup coldstart
snmp-server enable traps slb real virtual csrpf
snmp-server enable traps flash insertion removal
snmp-server enable traps hsrp
snmp-server enable traps config
snmp-server enable traps entity
snmp-server enable traps fru-ctrl
snmp-server enable traps bgp
snmp-server enable traps rsvp
snmp-server enable traps frame-relay
snmp-server enable traps rtr
snmp-server enable traps isdn call-information
snmp-server enable traps isdn layer2
snmp-server enable traps dlsw

MODULE 15-MODULE15-Line

MODULE 15-MODULE15-Line-Line con 0
line con 0
exec-timeout 30 0
privilege level 15
logging synchronous

MODULE 15-MODULE15-Line-Line vty 0 4
line vty 0 4
privilege level 15
password*****
no login

```

Site1 Cisco Catalyst 6509 Access Switch

```
Device Configuration Viewer
nsl-acsl

Global
  set feature agg-link-partner disable
  set option long-cable disable
  set password*****
  set enablepass*****
  set prompt nsl-acsl-sw
  set length 24 default
  set logout 0
  set config mode binary
  set banner motd "
  NSITE GB IPCC testing. Contact gb-ipcc@cisco.com
  "
  set banner lcd ""

***** ALL (DEFAULT and NON-DEFAULT) CONFIGURATION *****

time
  #time: Wed Aug 18 2004, 14:43:00

version
  #version 8.2(2)

system web interface version Engine Version: 5.3.4 ADP Device: Cat6000
ADP Version: 5.0 ADK: 40

test
  set test diaglevel minimal
  set test diagfail-action offline

dot1x
  set dot1x system-auth-control enable
  set dot1x quiet-period 60
  set dot1x tx-period 30
  set dot1x shutdown-timeout 0
  set dot1x supp-timeout 30
  set dot1x server-timeout 30
  set dot1x max-req 2
  set dot1x re-authperiod 3600
  set feature dot1x-radius-keepalive enable

errordetection
  set errordetection inband disable
```

```
set errordetection memory disable
set errordetection packet-buffer errdisable
set errordetection portcounter disable

system
  set system baud 9600
  set system modem disable
  set system name NS1-ACS1
  set system location NSITE-lab2 rack 236
  set system contact
  set system countrycode
  set traffic monitor 100
  set system highavailability enable
  set system highavailability versioning disable
  set system info-log disable
  set system info-log tftp 0.0.0.0 sysinfo
  set system info-log interval 1440
  set system crossbar-fallback bus-mode
  set system switchmode allow truncated
  set system switchmode threshold 2
  set system core-dump disable
  set system core-file slot0:crashinfo
  set system syslog-dump disable
  set system syslog-file slot0:sysloginfo
  set system supervisor-update disable
  set feature log-command enable
  set feature loop-detect enable
  set feature supmon enable

power
  set power redundancy disable

Default Inlinepower
  set inlinepower defaultallocation 7000

frame distribution method
  set port channel all distribution ip both

mac address reduction
  set spantree macreduction disable

default portcost mode
  set spantree defaultcostmode short

snmp
  set snmp community*****
  set snmp community*****
  set snmp community*****
```

```
set snmp rmon disable
set snmp rmonmemory 85
set snmp enable
set snmp trap enable module
set snmp trap enable chassis
set snmp trap enable bridge
set snmp trap enable vtp
set snmp trap enable vlancreate
set snmp trap enable vlandelete
set snmp trap enable auth
set snmp trap enable entityfru
set snmp trap enable ippermit
set snmp trap enable sysinfolog
set snmp chassis-alias
set snmp buffer 40
set snmp trap enable vmps
set snmp trap enable entity
set snmp trap enable config
set snmp trap enable stpx
set snmp trap enable syslog
set snmp trap enable system
set snmp trap enable envfan
set snmp trap enable envshutdown
set snmp trap enable envpower
set snmp trap enable envtemp
set snmp trap enable envstate
set snmp trap enable flashinsert
set snmp trap enable flashremove
set snmp trap enable callhomesntp
set snmp trap enable macnotification
set snmp trap enable redundancy

tacacs+
  set tacacs attempts 3
  set tacacs directedrequest disable
  set tacacs timeout 5

radius
  set radius deadtime 0
  set radius timeout 5
  set radius retransmit 2
  set radius attribute framed-ip-address include-in-access-req
disable

kerberos

authentication
  set authentication login tacacs disable console
```

```

set authentication login tacacs disable telnet
set authentication login tacacs disable http
set authentication enable tacacs disable console
set authentication enable tacacs disable telnet
set authentication enable tacacs disable http
set authentication login radius disable console
set authentication login radius disable telnet
set authentication login radius disable http
set authentication enable radius disable console
set authentication enable radius disable telnet
set authentication enable radius disable http
set authentication login local enable console
set authentication login local enable telnet
set authentication login local enable http
set authentication enable local enable console
set authentication enable local enable telnet
set authentication enable local enable http
set authentication login kerberos disable console
set authentication login kerberos disable telnet
set authentication login kerberos disable http
set authentication enable kerberos disable console
set authentication enable kerberos disable telnet
set authentication enable kerberos disable http
set authentication login attempt 3 console
set authentication login attempt 3 telnet
set authentication login lockout 0 console
set authentication login lockout 0 telnet
set authentication enable attempt 3 console
set authentication enable attempt 3 telnet
set authentication enable lockout 0 console
set authentication enable lockout 0 telnet

```

Local User

```

set localuser authentication disable

```

stp mode

```

set spantree mode pvst+

```

vtp

```

set vtp domain gb-ipcc
set vtp mode transparent unknown
set vtp mode transparent vlan
set vtp passwd cisco
set vtp version 1
set vtp pruneeligible 2-1000
clear vtp pruneeligible 1001-1005
set vlan 2 name Management_VLAN type ethernet mtu 1500 said 100002
state active

```

```
    set vlan 10 name NS1_OSPF_VLAN type ethernet mtu 1500 said 100010
state active
    set vlan 101 name NS1_ACS1_CCM_VLAN type ethernet mtu 1500 said
100101 state active
    set vlan 103 name NS1_ACS1_Simclient_VLAN type ethernet mtu 1500
said 100103 state active
    set vlan 105 name NS1_Cilttest_ACS1 type ethernet mtu 1500 said
100105 state active
    set vlan 107 name NS1_ICM_ACS1 type ethernet mtu 1500 said 100107
state active
    set vlan 109 name NS1_GK_ACS1 type ethernet mtu 1500 said 100109
state active
    set vlan 113 name NS1_DESKTOP_VLAN type ethernet mtu 1500 said
100113 state active
    set vlan 114 name NS1_IP_Phones type ethernet mtu 1500 said 100114
state active
    set vlan 804 name NS0_MISC_VLAN type ethernet mtu 1500 said 100804
state active
    set vlan 888 rspan name VLAN0888 state active
    set vlan 901 name NS1-RGRA_PVT_VLAN type ethernet mtu 1500 said
100901 state active
    set vlan 1002 name fddi-default type fddi mtu 1500 said 101002
state active
    set vlan 1004 name fddinet-default type fddinet mtu 1500 said
101004 state active stp ieee
    set vlan 1005 name trnet-default type trbrf mtu 1500 said 101005
state active stp ibm
    set vlan 1,115
    set vlan 1003 name token-ring-default type trcrf mtu 1500 said
101003 state active mode srb aremaxhop 7 stemaxhop 7 backupcrf off

dot1q-all-tagged
    set dot1q-all-tagged disable

Layer 2 protocol tunnel
    set l2protocol-tunnel cos 5
    set l2protocol-tunnel trunk disable

ip
    set feature mdg enable
    set feature psync-recovery no-powerdown
    set interface sc0 2 10.12.2.21/255.255.255.224 10.12.2.31
    set interface sc0 up
    set interface trap sc0 disable
    set interface sl0 0.0.0.0 0.0.0.0
    set interface sl0 up
    set interface trap sl0 disable
    set interface sc1 1 0.0.0.0/0.0.0.0 0.0.0.0
```

```
set interface sc1 down
set interface trap sc1 disable
set arp agingtime 1200
set ip redirect enable
set ip unreachable enable
set ip fragmentation enable
set ip route 0.0.0.0/0.0.0.0 10.12.2.6
set ip alias default 0.0.0.0

command alias
set alias rtr sess 15
set alias cmm1 ses 4
set alias cmm2 ses 5

vmps
set vmps server retry 3
set vmps server reconfirminterval 60
set vmps downloadmethod tftp
set vmps downloadserver 0.0.0.0 vmps-config-database.1
set vmps state disable

rcp
set rcp username cwuser

ftp
set ftp username
set ftp password encrypted
set ftp mode passive enable

dns
set ip dns server 10.12.4.43 primary
set ip dns server 10.12.4.35
set ip dns enable
set ip dns domain ipcc.com

spantree
set spantree global-default portfast disable
set spantree global-default loop-guard disable

portfast
set spantree global-default bpdu-guard disable
set spantree global-default bpdu-filter disable

bpdu-skewing
set spantree bpdu-skewing disable

MST (IEEE 802.1s)
set spantree fwddelay 15 mst
```



```
set spantree hello 2 mst
set spantree maxage 20 mst
set spantree mst maxhops 20
set spantree priority 32768 mst
set spantree priority 32768 mst 1
set spantree priority 32768 mst 2
set spantree priority 32768 mst 3
set spantree priority 32768 mst 4
set spantree priority 32768 mst 5
set spantree priority 32768 mst 6
set spantree priority 32768 mst 7
set spantree priority 32768 mst 8
set spantree priority 32768 mst 9
set spantree priority 32768 mst 10
set spantree priority 32768 mst 11
set spantree priority 32768 mst 12
set spantree priority 32768 mst 13
set spantree priority 32768 mst 14
set spantree priority 32768 mst 15
```

MST Configuration

```
set spantree mst config rollback force
set spantree mst config name revision 0
set spantree mst 0 vlan 1-4094
set spantree mst config commit
```

uplinkfast groups

```
set spantree uplinkfast disable
```

backbonefast

```
set spantree backbonefast disable
```

vlan parameters

```
set spantree enable 1-2,10,101,103,105,107,109,113-115,804,888,901
set spantree fwddelay 15
1-2,10,101,103,105,107,109,113-115,804,888,901
set spantree hello 2
1-2,10,101,103,105,107,109,113-115,804,888,901
set spantree maxage 20
1-2,10,101,103,105,107,109,113-115,804,888,901
set spantree priority 32768
1-2,10,101,103,105,107,109,113-115,804,888,901
```

syslog

```
set logging console enable
set logging telnet enable
set logging server enable
set logging server 10.12.13.210
```

```
set logging level cdp 4 default
set logging level mcast 2 default
set logging level dtp 5 default
set logging level dvlan 2 default
set logging level earl 2 default
set logging level ip 3 default
set logging level pruning 2 default
set logging level snmp 2 default
set logging level spantree 2 default
set logging level sys 5 default
set logging level tac 2 default
set logging level tcp 2 default
set logging level telnet 2 default
set logging level tftp 2 default
set logging level vtp 2 default
set logging level vmps 2 default
set logging level kernel 2 default
set logging level filesys 2 default
set logging level mgmt 5 default
set logging level mls 5 default
set logging level protfilt 2 default
set logging level security 2 default
set logging level radius 2 default
set logging level udld 4 default
set logging level gvrp 2 default
set logging level cops 3 default
set logging level qos 3 default
set logging level acl 5 default
set logging level rsvp 3 default
set logging level ld 3 default
set logging level privatevlan 3 default
set logging level ethc 5 default
set logging level gl2pt 5 default
set logging level callhome 2 default
set logging server facility LOCAL7
set logging server severity 4
set logging timestamp enable
set logging buffer 500
set logging history 1
set logging history severity 4
```

Callhome Functionality

```
set logging callhome disable
set logging callhome severity 2
```

ntp

```
set ntp broadcastclient disable
set ntp broadcastdelay 3000
```

```
set ntp client enable
set ntp authentication disable
set ntp server 10.12.2.1
set timezone EST -5 0
set summertime enable
set summertime recurring

set boot command
set boot config-register 0xf
set boot config-register auto-config overwrite
set boot config-register auto-config sync disable
set boot system flash bootflash:cat6000-sup2cvk8.8-2-2.bin
set config acl nvram

permit list
set ip permit disable telnet
set ip permit disable ssh
set ip permit disable snmp

permanent arp entries

igmp
set igmp enable
set igmp fastleave disable
set igmp v3-processing disable
set igmp fastblock disable
set igmp ratelimit disable
set igmp ratelimit general-query 100
set igmp ratelimit dvmrp 100
set igmp ratelimit mospf1 100
set igmp ratelimit mosfp2 100
set igmp ratelimit pimv2 100

igmp querier
set igmp querier disable 1-1005,1025-4094
set igmp querier 1-1005,1025-4094 qi 125
set igmp querier 1-1005,1025-4094 oqi 300

rgmp
set rgmp disable

protocolfilter
set protocolfilter disable

mls
set mls flow destination
set mls rate 0
set mls cef load-balance source-destination-ip
```

```
set mls cef per-prefix-stats enable
set mls verify checksum enable
set mls verify length ip minimum enable
set mls verify length ip inconsistant enable
set mls verify length ipx minimum enable
set mls verify length ipx inconsistant enable
set mls bridged-flow-statistics disable 1-1000,1025-4094
set mls nde version 7
set mls nde destination-ifindex enable
set mls nde source-ifindex enable
set mls agingtime long-duration 1920
set mls agingtime 256
set mls agingtime ipx 256
set mls agingtime fast 0 0
set mls nde disable

lcperroraction
  set lcperroraction ignore

vlan mapping

gmrp
  set gmrp disable

garp
  set garp timer all 200 600 10000

cdp
  set cdp interval 60
  set cdp holdtime 180
  set cdp enable
  set cdp version v2
  set cdp format device-id other

cops
  set cops retry-interval 30 30 300

acllog
  set acllog ratelimit 6553700

qos
  set qos enable
  set qos drop-threshold 1q4t rx queue 1 50 60 80 100
  set qos map 2q2t tx 1 1 cos 0
  set qos map 2q2t tx 1 1 cos 1
  set qos map 2q2t tx 1 2 cos 2
  set qos map 2q2t tx 1 2 cos 3
  set qos map 2q2t tx 2 1 cos 4
```

```
set qos map 2q2t tx 2 1 cos 5
set qos map 2q2t tx 2 2 cos 6
set qos map 2q2t tx 2 2 cos 7
set qos drop-threshold 2q2t tx queue 1 80 100
set qos drop-threshold 2q2t tx queue 2 80 100
set qos wrr 2q2t 100 255
set qos txq-ratio 2q2t 80 20
set qos map 1p1q4t rx 1 1 cos 0
set qos map 1p1q4t rx 1 1 cos 1
set qos map 1p1q4t rx 1 2 cos 2
set qos map 1p1q4t rx 1 2 cos 3
set qos map 1p1q4t rx 1 3 cos 4
set qos map 1p1q4t rx 2 1 cos 5
set qos map 1p1q4t rx 1 3 cos 6
set qos map 1p1q4t rx 1 4 cos 7
set qos drop-threshold 1p1q4t rx queue 1 50 60 80 100
set qos map 1p2q2t tx 1 1 cos 0
set qos map 1p2q2t tx 1 1 cos 1
set qos map 1p2q2t tx 1 2 cos 2
set qos map 1p2q2t tx 1 2 cos 3
set qos map 1p2q2t tx 2 1 cos 4
set qos map 1p2q2t tx 3 1 cos 5
set qos map 1p2q2t tx 2 1 cos 6
set qos map 1p2q2t tx 2 2 cos 7
set qos wrr 1p2q2t 100 255
set qos txq-ratio 1p2q2t 70 15 15
set qos wred 1p2q2t tx queue 1 40:70 70:100
set qos wred 1p2q2t tx queue 2 40:70 70:100
set qos map 1p3q1t tx 1 1 cos 0
set qos map 1p3q1t tx 1 1 cos 1
set qos map 1p3q1t tx 2 1 cos 2
set qos map 1p3q1t tx 2 1 cos 3
set qos map 1p3q1t tx 2 1 cos 4
set qos map 1p3q1t tx 4 1 cos 5
set qos map 1p3q1t tx 3 1 cos 6
set qos map 1p3q1t tx 3 1 cos 7
set qos wrr 1p3q1t 100 150 200
set qos wred 1p3q1t tx queue 1 70:100
set qos wred 1p3q1t tx queue 2 70:100
set qos wred 1p3q1t tx queue 3 70:100
set qos map 1p1q0t rx 1 cos 0
set qos map 1p1q0t rx 1 cos 1
set qos map 1p1q0t rx 1 cos 2
set qos map 1p1q0t rx 1 cos 3
set qos map 1p1q0t rx 1 cos 4
set qos map 1p1q0t rx 2 cos 5
set qos map 1p1q0t rx 1 cos 6
set qos map 1p1q0t rx 1 cos 7
```

```

set qos rxq-ratio lp1q0t 80 20
set qos map lp2q1t tx 1 1 cos 0
set qos map lp2q1t tx 1 1 cos 1
set qos map lp2q1t tx 1 1 cos 2
set qos map lp2q1t tx 1 1 cos 3
set qos map lp2q1t tx 2 1 cos 4
set qos map lp2q1t tx 3 1 cos 5
set qos map lp2q1t tx 2 1 cos 6
set qos map lp2q1t tx 2 1 cos 7
set qos wrr lp2q1t 100 255
set qos txq-ratio lp2q1t 50 30 20
set qos wred lp2q1t tx queue 1 70:100
set qos wred lp2q1t tx queue 2 70:100
set qos map lp1q8t rx 1 1 cos 0
set qos map lp1q8t rx 1 2 cos 1
set qos map lp1q8t rx 1 3 cos 2
set qos map lp1q8t rx 1 4 cos 3
set qos map lp1q8t rx 1 5 cos 4
set qos map lp1q8t rx 2 1 cos 5
set qos map lp1q8t rx 1 6 cos 6
set qos map lp1q8t rx 1 7 cos 7
set qos rxq-ratio lp1q8t 80 20
set qos wred lp1q8t rx queue 1 40:70 40:70 50:80 50:80 60:90 60:90
70:100 70:100
set qos map lq2t rx 1 1 cos 0
set qos map lq2t rx 1 1 cos 1
set qos map lq2t rx 1 1 cos 2
set qos map lq2t rx 1 1 cos 3
set qos map lq2t rx 1 1 cos 4
set qos map lq2t rx 1 2 cos 5
set qos map lq2t rx 1 2 cos 6
set qos map lq2t rx 1 2 cos 7
set qos drop-threshold lq2t rx queue 1 80 100
set qos bridged-microflow-policing disable 1-1000,1025-4094
set qos cos-dscp-map 0 8 16 24 32 40 48 56
set qos ipprec-dscp-map 0 8 16 24 32 40 48 56
set qos dscp-cos-map 0-7:0
set qos dscp-cos-map 8-15:1
set qos dscp-cos-map 16-23:2
set qos dscp-cos-map 24-31:3
set qos dscp-cos-map 32-39:4
set qos dscp-cos-map 40-47:5
set qos dscp-cos-map 48-55:6
set qos dscp-cos-map 56-63:7
set qos policed-dscp-map 0:0
set qos policed-dscp-map 1:1
set qos policed-dscp-map 2:2
set qos policed-dscp-map 3:3

```

```
set qos policed-dscp-map 4:4
set qos policed-dscp-map 5:5
set qos policed-dscp-map 6:6
set qos policed-dscp-map 7:7
set qos policed-dscp-map 8:8
set qos policed-dscp-map 9:9
set qos policed-dscp-map 10:10
set qos policed-dscp-map 11:11
set qos policed-dscp-map 12:12
set qos policed-dscp-map 13:13
set qos policed-dscp-map 14:14
set qos policed-dscp-map 15:15
set qos policed-dscp-map 16:16
set qos policed-dscp-map 17:17
set qos policed-dscp-map 18:18
set qos policed-dscp-map 19:19
set qos policed-dscp-map 20:20
set qos policed-dscp-map 21:21
set qos policed-dscp-map 22:22
set qos policed-dscp-map 23:23
set qos policed-dscp-map 24:24
set qos policed-dscp-map 25:25
set qos policed-dscp-map 26:26
set qos policed-dscp-map 27:27
set qos policed-dscp-map 28:28
set qos policed-dscp-map 29:29
set qos policed-dscp-map 30:30
set qos policed-dscp-map 31:31
set qos policed-dscp-map 32:32
set qos policed-dscp-map 33:33
set qos policed-dscp-map 34:34
set qos policed-dscp-map 35:35
set qos policed-dscp-map 36:36
set qos policed-dscp-map 37:37
set qos policed-dscp-map 38:38
set qos policed-dscp-map 39:39
set qos policed-dscp-map 40:40
set qos policed-dscp-map 41:41
set qos policed-dscp-map 42:42
set qos policed-dscp-map 43:43
set qos policed-dscp-map 44:44
set qos policed-dscp-map 45:45
set qos policed-dscp-map 46:46
set qos policed-dscp-map 47:47
set qos policed-dscp-map 48:48
set qos policed-dscp-map 49:49
set qos policed-dscp-map 50:50
set qos policed-dscp-map 51:51
```

```
set qos policed-dscp-map 52:52
set qos policed-dscp-map 53:53
set qos policed-dscp-map 54:54
set qos policed-dscp-map 55:55
set qos policed-dscp-map 56:56
set qos policed-dscp-map 57:57
set qos policed-dscp-map 58:58
set qos policed-dscp-map 59:59
set qos policed-dscp-map 60:60
set qos policed-dscp-map 61:61
set qos policed-dscp-map 62:62
set qos policed-dscp-map 63:63
set qos policed-dscp-map excess-rate 0:0
set qos policed-dscp-map excess-rate 1:1
set qos policed-dscp-map excess-rate 2:2
set qos policed-dscp-map excess-rate 3:3
set qos policed-dscp-map excess-rate 4:4
set qos policed-dscp-map excess-rate 5:5
set qos policed-dscp-map excess-rate 6:6
set qos policed-dscp-map excess-rate 7:7
set qos policed-dscp-map excess-rate 8:8
set qos policed-dscp-map excess-rate 9:9
set qos policed-dscp-map excess-rate 10:10
set qos policed-dscp-map excess-rate 11:11
set qos policed-dscp-map excess-rate 12:12
set qos policed-dscp-map excess-rate 13:13
set qos policed-dscp-map excess-rate 14:14
set qos policed-dscp-map excess-rate 15:15
set qos policed-dscp-map excess-rate 16:16
set qos policed-dscp-map excess-rate 17:17
set qos policed-dscp-map excess-rate 18:18
set qos policed-dscp-map excess-rate 19:19
set qos policed-dscp-map excess-rate 20:20
set qos policed-dscp-map excess-rate 21:21
set qos policed-dscp-map excess-rate 22:22
set qos policed-dscp-map excess-rate 23:23
set qos policed-dscp-map excess-rate 24:24
set qos policed-dscp-map excess-rate 25:25
set qos policed-dscp-map excess-rate 26:26
set qos policed-dscp-map excess-rate 27:27
set qos policed-dscp-map excess-rate 28:28
set qos policed-dscp-map excess-rate 29:29
set qos policed-dscp-map excess-rate 30:30
set qos policed-dscp-map excess-rate 31:31
set qos policed-dscp-map excess-rate 32:32
set qos policed-dscp-map excess-rate 33:33
set qos policed-dscp-map excess-rate 34:34
set qos policed-dscp-map excess-rate 35:35
```



```
set qos policed-dscp-map excess-rate 36:36
set qos policed-dscp-map excess-rate 37:37
set qos policed-dscp-map excess-rate 38:38
set qos policed-dscp-map excess-rate 39:39
set qos policed-dscp-map excess-rate 40:40
set qos policed-dscp-map excess-rate 41:41
set qos policed-dscp-map excess-rate 42:42
set qos policed-dscp-map excess-rate 43:43
set qos policed-dscp-map excess-rate 44:44
set qos policed-dscp-map excess-rate 45:45
set qos policed-dscp-map excess-rate 46:46
set qos policed-dscp-map excess-rate 47:47
set qos policed-dscp-map excess-rate 48:48
set qos policed-dscp-map excess-rate 49:49
set qos policed-dscp-map excess-rate 50:50
set qos policed-dscp-map excess-rate 51:51
set qos policed-dscp-map excess-rate 52:52
set qos policed-dscp-map excess-rate 53:53
set qos policed-dscp-map excess-rate 54:54
set qos policed-dscp-map excess-rate 55:55
set qos policed-dscp-map excess-rate 56:56
set qos policed-dscp-map excess-rate 57:57
set qos policed-dscp-map excess-rate 58:58
set qos policed-dscp-map excess-rate 59:59
set qos policed-dscp-map excess-rate 60:60
set qos policed-dscp-map excess-rate 61:61
set qos policed-dscp-map excess-rate 62:62
set qos policed-dscp-map excess-rate 63:63
set qos acl default-action ip trust-dscp
set qos acl default-action ipx
set qos acl default-action mac
set qos policy-source local
set qos rsvp disable
set qos rsvp policy-timeout 30
set qos rsvp local-policy forward

mmls nonrpf
  set mmls nonrpf enable
  set mmls nonrpf timer 60
  set mmls nonrpf window 10
  set mmls nonrpf timer 10

mmls flow-statistics
  set mmls flow-statistics timer 20
  set mmls flow-statistics threshold 60

udld
  set udld disable
```

```
set udld interval 15

LACP channel
  set lacp-channel system-priority 32768

channelprotocol
  set channelprotocol pagp 1
  set channelprotocol pagp 2
  set channelprotocol pagp 3

port channel
  set port channel 1/1-2 531
  set port channel 3/1-4 534
  set port channel 3/5-8 535
  set port channel 3/9-12 536
  set port channel 3/13-16 537
  set port channel 3/17-20 538
  set port channel 3/21-24 539
  set port channel 3/25-28 540
  set port channel 3/29-32 541
  set port channel 3/33-36 542
  set port channel 3/37-40 543
  set port channel 3/41-44 544
  set port channel 3/45-48 545
  set port channel 2/1-2 548

security ACLs
  set security acl arp-inspection match-mac enable
  set security acl arp-inspection address-validation enable
  set security acl feature ratelimit 500
  set security acl log maxflow 500
  set security acl log ratelimit 2500

accounting
  set accounting exec disable
  set accounting connect disable
  set accounting system disable
  set accounting commands disable
  set accounting suppress null-username disable
  set accounting update new-info

errdisable timeout
  set errdisable-timeout disable other
  set errdisable-timeout disable udld
  set errdisable-timeout disable duplex-mismatch
  set errdisable-timeout disable bpdu-guard
  set errdisable-timeout disable channel-misconfig
  set errdisable-timeout disable crossbar-fallback
```

```
set errdisable-timeout disable packet-buffer-error
set errdisable-timeout disable gl2pt-ingress-loop
set errdisable-timeout disable gl2pt-threshold-exceed
set errdisable-timeout disable bcast-suppression
set errdisable-timeout disable arp-inspection
set errdisable-timeout interval 300

http configuration
  set ip http server disable
  set ip http port 80

private vlans

crypto key

qos statistics data export
  set qos statistics export disable
  set qos statistics export interval 300

mmls srm
  set mmls srm leak-start 30
  set mmls srm purge 120
  set mmls srm enable
  set mmls srm leak-end 90
  set mmls srm batch-size 10

port security
  set port security auto-configure disable

default port status is enable

module 1 : 2-port 1000BaseX Supervisor
  set module name 1
  set vlan 1 1/1-2
  set port enable 1/1-2
  set port clock 1/1-2 auto
  set port trap 1/1-2 enable
  set port name 1/1 Trunk_to_NS1-Core
  set port name 1/2
  set port security 1/1-2 disable age 0 maximum 1 shutdown 0
unicast-flood enable violation shutdown
  set port dot1x 1/1-2 port-control force-authorized
  set port dot1x 1/1-2 multiple-host disable
  set port dot1x 1/1-2 multiple-authentication disable
  set port dot1x 1/1-2 shutdown-timeout disable
  set port dot1x 1/1-2 re-authentication disable
  set port dot1x 1/1 guest-vlan 0
  set port dot1x 1/2 guest-vlan none
```

```

set port broadcast 1/1-2 100.00% violation drop-packets multicast
disable unicast disable
set port membership 1/1-2 static
set port protocol 1/1-2 ip on
set port protocol 1/1-2 ipx auto
set port protocol 1/1-2 group auto
set port negotiation 1/1-2 enable
set port flowcontrol 1/1-2 send desired
set port flowcontrol 1/1-2 receive off
set port vtp 1/1-2 enable
set cdp enable 1/1-2
set udld enable 1/1
set udld aggressive-mode disable 1/1-2
set trunk 1/1 on isl 1-1005,1025-4094
set trunk 1/2 auto negotiate 1-1005,1025-4094
set spantree portfast 1/1-2 default
set spantree bpdu-filter 1/1-2 default
set spantree bpdu-guard 1/1-2 default
set spantree mst link-type 1/1-2 auto
set spantree portpri 1/1-2 32 mst
set spantree portinstancepri 1/1 0 mst
set spantree portinstancepri 1/2 0 mst
set spantree portcost 1/1-2 20000 mst
set spantree portinstancecost 1/1 cost 19999 mst
set spantree portinstancecost 1/2 cost 19999 mst
set spantree portcost 1/1-2 4
set spantree portpri 1/1-2 32
set spantree portvlanpri 1/1 0
set spantree portvlanpri 1/2 0
set spantree portvlancost 1/1 cost 3
set spantree portvlancost 1/2 cost 3
set spantree guard default 1/1-2
set port qos 1/1-2 cos 0
set port qos 1/1 trust trust-dscp
set port qos 1/2 trust untrusted
set port qos 1/1-2 port-based
set port qos 1/1-2 policy-source cops
set port rsvp 1/1-2 dsbm-election disable 128
set port gvrp 1/1-2 disable
set gvrp registration normal 1/1-2
set gvrp applicant normal 1/1-2
set port gmrp 1/1-2 enable
set gmrp registration normal 1/1-2
set gmrp fwdall disable 1/1-2
set port jumbo 1/1-2 disable
set port dot1qtunnel 1/1-2 disable
set port dot1q-all-tagged 1/1-2 enable
set port dot1q-ethertype 1/1 8100

```

```

set port dot1q-ethertype 1/2 8100
set port l2protocol-tunnel 1/1-2 cdp stp vtp disable
set port l2protocol-tunnel 1/1 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 1/2 drop-threshold 0 shutdown-threshold
0
set port arp-inspection 1/1 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 1/2 drop-threshold 0 shutdown-threshold 0
set qos statistics export port 1/1 disable
set qos statistics export port 1/2 disable
set port sync-restart-delay 1/1 210
set port sync-restart-delay 1/2 210
set port debounce 1/1 disable
set port debounce 1/1 delay 10
set port debounce 1/2 disable
set port debounce 1/2 delay 10
set port unicast-flood 1/1-2 enable
set port errdisable-timeout 1/1-2 enable
set cam notification added disable 1/1-2
set cam notification removed disable 1/1-2
set port channel 1/1-2 mode auto silent

module 2 : 2-port 1000BaseX Supervisor
set module name 2
set vlan 1 2/1-2
set port enable 2/1-2
set port clock 2/1-2 auto
set port trap 2/1-2 enable
set port name 2/1-2
set port security 2/1-2 disable age 0 maximum 1 shutdown 0
unicast-flood enable violation shutdown
set port dot1x 2/1-2 port-control force-authorized
set port dot1x 2/1-2 multiple-host disable
set port dot1x 2/1-2 multiple-authentication disable
set port dot1x 2/1-2 shutdown-timeout disable
set port dot1x 2/1-2 re-authentication disable
set port dot1x 2/1-2 guest-vlan none
set port broadcast 2/1-2 100.00% violation drop-packets multicast
disable unicast disable
set port membership 2/1-2 static
set port protocol 2/1-2 ip on
set port protocol 2/1-2 ipx auto
set port protocol 2/1-2 group auto
set port negotiation 2/1-2 enable
set port flowcontrol 2/1-2 send desired
set port flowcontrol 2/1-2 receive off
set port vtp 2/1-2 enable
set cdp enable 2/1-2

```

```

set udld aggressive-mode disable 2/1-2
set trunk 2/1 auto negotiate 1-1005,1025-4094
set trunk 2/2 auto negotiate 1-1005,1025-4094
set spantree portfast 2/1-2 default
set spantree bpdu-filter 2/1-2 default
set spantree bpdu-guard 2/1-2 default
set spantree mst link-type 2/1-2 auto
set spantree portpri 2/1-2 32 mst
set spantree portinstancepri 2/1 0 mst
set spantree portinstancepri 2/2 0 mst
set spantree portcost 2/1-2 20000 mst
set spantree portinstancecost 2/1 cost 19999 mst
set spantree portinstancecost 2/2 cost 19999 mst
set spantree portcost 2/1-2 4
set spantree portpri 2/1-2 32
set spantree portvlanpri 2/1 0
set spantree portvlanpri 2/2 0
set spantree portvlancost 2/1 cost 3
set spantree portvlancost 2/2 cost 3
set spantree guard default 2/1-2
set port qos 2/1-2 cos 0
set port qos 2/1-2 trust untrusted
set port qos 2/1-2 port-based
set port qos 2/1-2 policy-source cops
set port rsvp 2/1-2 dsbm-election disable 128
set port gvrp 2/1-2 disable
set gvrp registration normal 2/1-2
set gvrp applicant normal 2/1-2
set port gmrp 2/1-2 enable
set gmrp registration normal 2/1-2
set gmrp fwdall disable 2/1-2
set port jumbo 2/1-2 disable
set port dot1qtunnel 2/1-2 disable
set port dot1q-all-tagged 2/1-2 enable
set port dot1q-ethertype 2/1 8100
set port dot1q-ethertype 2/2 8100
set port l2protocol-tunnel 2/1-2 cdp stp vtp disable
set port l2protocol-tunnel 2/1 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 2/2 drop-threshold 0 shutdown-threshold
0
set port arp-inspection 2/1 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 2/2 drop-threshold 0 shutdown-threshold 0
set qos statistics export port 2/1 disable
set qos statistics export port 2/2 disable
set port sync-restart-delay 2/1 210
set port sync-restart-delay 2/2 210
set port debounce 2/1 disable

```

```
set port debounce 2/1 delay 10
set port debounce 2/2 disable
set port debounce 2/2 delay 10
set port unicast-flood 2/1-2 enable
set port errdisable-timeout 2/1-2 enable
set cam notification added disable 2/1-2
set cam notification removed disable 2/1-2
set port channel 2/1-2 mode auto silent

module 3 : 48-port 10/100BaseTX Ethernet
  set module name      3
  set module enable    3
  set vlan 1           3/1,3/3-24,3/40-43,3/46-48
  set vlan 101         3/25-30,3/33,3/37
  set vlan 103         3/44
  set vlan 105         3/2,3/45
  set vlan 107         3/31,3/34-36
  set vlan 109         3/38-39
  set vlan 901         3/32
  set port auxiliaryvlan 3/1-48 none
  set port inlinepower 3/1-48 auto 7000
  set port inlinepower 3/1-48 discovery cisco
  set port qos 3/1-48 trust-ext untrusted
  set port qos 3/1-48 cos-ext 0
  set port qos 3/1-48 trust-device none
  set port enable      3/1-48
  set port speed        3/1-48 100
  set port duplex       3/1-48 full
  set port trap         3/1-48 enable
  set port name         3/2  NS1-CIL3
  set port name         3/25 NS1-PUB
  set port name         3/26 NS1-CM1
  set port name         3/27 NS1-CM3
  set port name         3/28 NS1-CM5
  set port name         3/29 NS1-CM7
  set port name         3/30 NS1-IVR1
  set port name         3/31 NS1-RGRA
  set port name         3/32 NS1-RGRA-PVT
  set port name         3/33 NS1-MOH1
  set port name         3/34 NS1-PG1A
  set port name         3/35 NS1-DCA
  set port name         3/36 NS1-PG2A
  set port name         3/37 NS1-UNITY
  set port name         3/38 NS1-CSAMC
  set port name         3/39 NS1-GK1
  set port name         3/44 NS1-SIM1
  set port name         3/45 NS1-CIL1
  set port name         3/1,3/3-24,3/40-43,3/46-48
```

```

set port security 3/1-48 disable age 0 maximum 1 shutdown 0
unicast-flood enable violation shutdown
set port dot1x 3/1-48 port-control force-authorized
set port dot1x 3/1-48 multiple-host disable
set port dot1x 3/1-48 multiple-authentication disable
set port dot1x 3/1-48 shutdown-timeout disable
set port dot1x 3/1-48 re-authentication disable
set port dot1x 3/1-48 guest-vlan none
set port broadcast 3/1-48 100.00% violation drop-packets
set port membership 3/1-48 static
set port protocol 3/1-48 ip on
set port protocol 3/1-48 ipx auto
set port protocol 3/1-48 group auto
set port flowcontrol 3/1-48 send off
set port flowcontrol 3/1-48 receive off
set port vtp 3/1-48 enable
set cdp enable 3/1-48
set udld disable 3/1-48
set udld aggressive-mode disable 3/1-48
set trunk 3/1 auto negotiate 1-1005,1025-4094
set trunk 3/2 auto negotiate 1-1005,1025-4094
set trunk 3/3 auto negotiate 1-1005,1025-4094
set trunk 3/4 auto negotiate 1-1005,1025-4094
set trunk 3/5 auto negotiate 1-1005,1025-4094
set trunk 3/6 auto negotiate 1-1005,1025-4094
set trunk 3/7 auto negotiate 1-1005,1025-4094
set trunk 3/8 auto negotiate 1-1005,1025-4094
set trunk 3/9 auto negotiate 1-1005,1025-4094
set trunk 3/10 auto negotiate 1-1005,1025-4094
set trunk 3/11 auto negotiate 1-1005,1025-4094
set trunk 3/12 auto negotiate 1-1005,1025-4094
set trunk 3/13 auto negotiate 1-1005,1025-4094
set trunk 3/14 auto negotiate 1-1005,1025-4094
set trunk 3/15 auto negotiate 1-1005,1025-4094
set trunk 3/16 auto negotiate 1-1005,1025-4094
set trunk 3/17 auto negotiate 1-1005,1025-4094
set trunk 3/18 auto negotiate 1-1005,1025-4094
set trunk 3/19 auto negotiate 1-1005,1025-4094
set trunk 3/20 auto negotiate 1-1005,1025-4094
set trunk 3/21 auto negotiate 1-1005,1025-4094
set trunk 3/22 auto negotiate 1-1005,1025-4094
set trunk 3/23 auto negotiate 1-1005,1025-4094
set trunk 3/24 auto negotiate 1-1005,1025-4094
set trunk 3/25 auto negotiate 1-1005,1025-4094
set trunk 3/26 auto negotiate 1-1005,1025-4094
set trunk 3/27 auto negotiate 1-1005,1025-4094
set trunk 3/28 auto negotiate 1-1005,1025-4094
set trunk 3/29 auto negotiate 1-1005,1025-4094

```



```
set trunk 3/30 auto negotiate 1-1005,1025-4094
set trunk 3/31 auto negotiate 1-1005,1025-4094
set trunk 3/32 auto negotiate 1-1005,1025-4094
set trunk 3/33 auto negotiate 1-1005,1025-4094
set trunk 3/34 auto negotiate 1-1005,1025-4094
set trunk 3/35 auto negotiate 1-1005,1025-4094
set trunk 3/36 auto negotiate 1-1005,1025-4094
set trunk 3/37 auto negotiate 1-1005,1025-4094
set trunk 3/38 auto negotiate 1-1005,1025-4094
set trunk 3/39 auto negotiate 1-1005,1025-4094
set trunk 3/40 auto negotiate 1-1005,1025-4094
set trunk 3/41 auto negotiate 1-1005,1025-4094
set trunk 3/42 auto negotiate 1-1005,1025-4094
set trunk 3/43 auto negotiate 1-1005,1025-4094
set trunk 3/44 auto negotiate 1-1005,1025-4094
set trunk 3/45 auto negotiate 1-1005,1025-4094
set trunk 3/46 auto negotiate 1-1005,1025-4094
set trunk 3/47 auto negotiate 1-1005,1025-4094
set trunk 3/48 auto negotiate 1-1005,1025-4094
set spantree portfast 3/1-48 enable
set spantree bpdu-filter 3/1-48 default
set spantree bpdu-guard 3/1-48 default
set spantree mst link-type 3/1-48 auto
set spantree portpri 3/1-48 32 mst
set spantree portinstancepri 3/1 0 mst
set spantree portinstancepri 3/2 0 mst
set spantree portinstancepri 3/3 0 mst
set spantree portinstancepri 3/4 0 mst
set spantree portinstancepri 3/5 0 mst
set spantree portinstancepri 3/6 0 mst
set spantree portinstancepri 3/7 0 mst
set spantree portinstancepri 3/8 0 mst
set spantree portinstancepri 3/9 0 mst
set spantree portinstancepri 3/10 0 mst
set spantree portinstancepri 3/11 0 mst
set spantree portinstancepri 3/12 0 mst
set spantree portinstancepri 3/13 0 mst
set spantree portinstancepri 3/14 0 mst
set spantree portinstancepri 3/15 0 mst
set spantree portinstancepri 3/16 0 mst
set spantree portinstancepri 3/17 0 mst
set spantree portinstancepri 3/18 0 mst
set spantree portinstancepri 3/19 0 mst
set spantree portinstancepri 3/20 0 mst
set spantree portinstancepri 3/21 0 mst
set spantree portinstancepri 3/22 0 mst
set spantree portinstancepri 3/23 0 mst
set spantree portinstancepri 3/24 0 mst
```

```

set spantree portinstancepri 3/25 0 mst
set spantree portinstancepri 3/26 0 mst
set spantree portinstancepri 3/27 0 mst
set spantree portinstancepri 3/28 0 mst
set spantree portinstancepri 3/29 0 mst
set spantree portinstancepri 3/30 0 mst
set spantree portinstancepri 3/31 0 mst
set spantree portinstancepri 3/32 0 mst
set spantree portinstancepri 3/33 0 mst
set spantree portinstancepri 3/34 0 mst
set spantree portinstancepri 3/35 0 mst
set spantree portinstancepri 3/36 0 mst
set spantree portinstancepri 3/37 0 mst
set spantree portinstancepri 3/38 0 mst
set spantree portinstancepri 3/39 0 mst
set spantree portinstancepri 3/40 0 mst
set spantree portinstancepri 3/41 0 mst
set spantree portinstancepri 3/42 0 mst
set spantree portinstancepri 3/43 0 mst
set spantree portinstancepri 3/44 0 mst
set spantree portinstancepri 3/45 0 mst
set spantree portinstancepri 3/46 0 mst
set spantree portinstancepri 3/47 0 mst
set spantree portinstancepri 3/48 0 mst
set spantree portcost 3/1-48 200000 mst
set spantree portinstancecost 3/1 cost 199999 mst
set spantree portinstancecost 3/2 cost 199999 mst
set spantree portinstancecost 3/3 cost 199999 mst
set spantree portinstancecost 3/4 cost 199999 mst
set spantree portinstancecost 3/5 cost 199999 mst
set spantree portinstancecost 3/6 cost 199999 mst
set spantree portinstancecost 3/7 cost 199999 mst
set spantree portinstancecost 3/8 cost 199999 mst
set spantree portinstancecost 3/9 cost 199999 mst
set spantree portinstancecost 3/10 cost 199999 mst
set spantree portinstancecost 3/11 cost 199999 mst
set spantree portinstancecost 3/12 cost 199999 mst
set spantree portinstancecost 3/13 cost 199999 mst
set spantree portinstancecost 3/14 cost 199999 mst
set spantree portinstancecost 3/15 cost 199999 mst
set spantree portinstancecost 3/16 cost 199999 mst
set spantree portinstancecost 3/17 cost 199999 mst
set spantree portinstancecost 3/18 cost 199999 mst
set spantree portinstancecost 3/19 cost 199999 mst
set spantree portinstancecost 3/20 cost 199999 mst
set spantree portinstancecost 3/21 cost 199999 mst
set spantree portinstancecost 3/22 cost 199999 mst
set spantree portinstancecost 3/23 cost 199999 mst

```

```
set spantree portinstancecost 3/24 cost 199999 mst
set spantree portinstancecost 3/25 cost 199999 mst
set spantree portinstancecost 3/26 cost 199999 mst
set spantree portinstancecost 3/27 cost 199999 mst
set spantree portinstancecost 3/28 cost 199999 mst
set spantree portinstancecost 3/29 cost 199999 mst
set spantree portinstancecost 3/30 cost 199999 mst
set spantree portinstancecost 3/31 cost 199999 mst
set spantree portinstancecost 3/32 cost 199999 mst
set spantree portinstancecost 3/33 cost 199999 mst
set spantree portinstancecost 3/34 cost 199999 mst
set spantree portinstancecost 3/35 cost 199999 mst
set spantree portinstancecost 3/36 cost 199999 mst
set spantree portinstancecost 3/37 cost 199999 mst
set spantree portinstancecost 3/38 cost 199999 mst
set spantree portinstancecost 3/39 cost 199999 mst
set spantree portinstancecost 3/40 cost 199999 mst
set spantree portinstancecost 3/41 cost 199999 mst
set spantree portinstancecost 3/42 cost 199999 mst
set spantree portinstancecost 3/43 cost 199999 mst
set spantree portinstancecost 3/44 cost 199999 mst
set spantree portinstancecost 3/45 cost 199999 mst
set spantree portinstancecost 3/46 cost 199999 mst
set spantree portinstancecost 3/47 cost 199999 mst
set spantree portinstancecost 3/48 cost 199999 mst
set spantree portcost 3/1-48 19
set spantree portpri 3/1-48 32
set spantree portvlanpri 3/1 0
set spantree portvlanpri 3/2 0
set spantree portvlanpri 3/3 0
set spantree portvlanpri 3/4 0
set spantree portvlanpri 3/5 0
set spantree portvlanpri 3/6 0
set spantree portvlanpri 3/7 0
set spantree portvlanpri 3/8 0
set spantree portvlanpri 3/9 0
set spantree portvlanpri 3/10 0
set spantree portvlanpri 3/11 0
set spantree portvlanpri 3/12 0
set spantree portvlanpri 3/13 0
set spantree portvlanpri 3/14 0
set spantree portvlanpri 3/15 0
set spantree portvlanpri 3/16 0
set spantree portvlanpri 3/17 0
set spantree portvlanpri 3/18 0
set spantree portvlanpri 3/19 0
set spantree portvlanpri 3/20 0
set spantree portvlanpri 3/21 0
```

```
set spantree portvlanpri 3/22 0
set spantree portvlanpri 3/23 0
set spantree portvlanpri 3/24 0
set spantree portvlanpri 3/25 0
set spantree portvlanpri 3/26 0
set spantree portvlanpri 3/27 0
set spantree portvlanpri 3/28 0
set spantree portvlanpri 3/29 0
set spantree portvlanpri 3/30 0
set spantree portvlanpri 3/31 0
set spantree portvlanpri 3/32 0
set spantree portvlanpri 3/33 0
set spantree portvlanpri 3/34 0
set spantree portvlanpri 3/35 0
set spantree portvlanpri 3/36 0
set spantree portvlanpri 3/37 0
set spantree portvlanpri 3/38 0
set spantree portvlanpri 3/39 0
set spantree portvlanpri 3/40 0
set spantree portvlanpri 3/41 0
set spantree portvlanpri 3/42 0
set spantree portvlanpri 3/43 0
set spantree portvlanpri 3/44 0
set spantree portvlanpri 3/45 0
set spantree portvlanpri 3/46 0
set spantree portvlanpri 3/47 0
set spantree portvlanpri 3/48 0
set spantree portvlancost 3/1 cost 18
set spantree portvlancost 3/2 cost 18
set spantree portvlancost 3/3 cost 18
set spantree portvlancost 3/4 cost 18
set spantree portvlancost 3/5 cost 18
set spantree portvlancost 3/6 cost 18
set spantree portvlancost 3/7 cost 18
set spantree portvlancost 3/8 cost 18
set spantree portvlancost 3/9 cost 18
set spantree portvlancost 3/10 cost 18
set spantree portvlancost 3/11 cost 18
set spantree portvlancost 3/12 cost 18
set spantree portvlancost 3/13 cost 18
set spantree portvlancost 3/14 cost 18
set spantree portvlancost 3/15 cost 18
set spantree portvlancost 3/16 cost 18
set spantree portvlancost 3/17 cost 18
set spantree portvlancost 3/18 cost 18
set spantree portvlancost 3/19 cost 18
set spantree portvlancost 3/20 cost 18
set spantree portvlancost 3/21 cost 18
```

```
set spantree portvlancost 3/22 cost 18
set spantree portvlancost 3/23 cost 18
set spantree portvlancost 3/24 cost 18
set spantree portvlancost 3/25 cost 18
set spantree portvlancost 3/26 cost 18
set spantree portvlancost 3/27 cost 18
set spantree portvlancost 3/28 cost 18
set spantree portvlancost 3/29 cost 18
set spantree portvlancost 3/30 cost 18
set spantree portvlancost 3/31 cost 18
set spantree portvlancost 3/32 cost 18
set spantree portvlancost 3/33 cost 18
set spantree portvlancost 3/34 cost 18
set spantree portvlancost 3/35 cost 18
set spantree portvlancost 3/36 cost 18
set spantree portvlancost 3/37 cost 18
set spantree portvlancost 3/38 cost 18
set spantree portvlancost 3/39 cost 18
set spantree portvlancost 3/40 cost 18
set spantree portvlancost 3/41 cost 18
set spantree portvlancost 3/42 cost 18
set spantree portvlancost 3/43 cost 18
set spantree portvlancost 3/44 cost 18
set spantree portvlancost 3/45 cost 18
set spantree portvlancost 3/46 cost 18
set spantree portvlancost 3/47 cost 18
set spantree portvlancost 3/48 cost 18
set spantree guard default 3/1-48
set port qos 3/1-48 cos 0
set port qos 3/31 trust trust-cos
set port qos 3/1-30,3/32-48 trust untrusted
set port qos 3/1-48 vlan-based
set port qos 3/1-48 policy-source local
set port rsvp 3/1-48 dsbm-election disable 128
set port gvrp 3/1-48 disable
set gvrp registration normal 3/1-48
set gvrp applicant normal 3/1-48
set port gmrp 3/1-48 enable
set gmrp registration normal 3/1-48
set gmrp fwdall disable 3/1-48
set port jumbo 3/1-48 disable
set port dot1qtunnel 3/1-48 disable
set port dot1q-all-tagged 3/1-48 enable
set port l2protocol-tunnel 3/1-48 cdp stp vtp disable
set port l2protocol-tunnel 3/1 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/2 drop-threshold 0 shutdown-threshold
0
```

```
0 set port l2protocol-tunnel 3/3 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/4 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/5 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/6 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/7 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/8 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/9 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/10 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/11 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/12 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/13 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/14 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/15 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/16 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/17 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/18 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/19 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/20 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/21 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/22 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/23 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/24 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/25 drop-threshold 0 shutdown-threshold
0
0 set port l2protocol-tunnel 3/26 drop-threshold 0 shutdown-threshold
0
```

```
set port l2protocol-tunnel 3/27 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/28 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/29 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/30 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/31 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/32 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/33 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/34 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/35 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/36 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/37 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/38 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/39 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/40 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/41 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/42 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/43 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/44 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/45 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/46 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/47 drop-threshold 0 shutdown-threshold
0
set port l2protocol-tunnel 3/48 drop-threshold 0 shutdown-threshold
0
set port arp-inspection 3/1 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/2 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/3 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/4 drop-threshold 0 shutdown-threshold 0
```

```

set port arp-inspection 3/5 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/6 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/7 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/8 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/9 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/10 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/11 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/12 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/13 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/14 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/15 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/16 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/17 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/18 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/19 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/20 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/21 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/22 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/23 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/24 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/25 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/26 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/27 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/28 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/29 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/30 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/31 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/32 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/33 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/34 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/35 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/36 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/37 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/38 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/39 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/40 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/41 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/42 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/43 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/44 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/45 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/46 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/47 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 3/48 drop-threshold 0 shutdown-threshold 0
set qos statistics export port 3/1 disable
set qos statistics export port 3/2 disable
set qos statistics export port 3/3 disable
set qos statistics export port 3/4 disable

```



```
set qos statistics export port 3/5 disable
set qos statistics export port 3/6 disable
set qos statistics export port 3/7 disable
set qos statistics export port 3/8 disable
set qos statistics export port 3/9 disable
set qos statistics export port 3/10 disable
set qos statistics export port 3/11 disable
set qos statistics export port 3/12 disable
set qos statistics export port 3/13 disable
set qos statistics export port 3/14 disable
set qos statistics export port 3/15 disable
set qos statistics export port 3/16 disable
set qos statistics export port 3/17 disable
set qos statistics export port 3/18 disable
set qos statistics export port 3/19 disable
set qos statistics export port 3/20 disable
set qos statistics export port 3/21 disable
set qos statistics export port 3/22 disable
set qos statistics export port 3/23 disable
set qos statistics export port 3/24 disable
set qos statistics export port 3/25 disable
set qos statistics export port 3/26 disable
set qos statistics export port 3/27 disable
set qos statistics export port 3/28 disable
set qos statistics export port 3/29 disable
set qos statistics export port 3/30 disable
set qos statistics export port 3/31 disable
set qos statistics export port 3/32 disable
set qos statistics export port 3/33 disable
set qos statistics export port 3/34 disable
set qos statistics export port 3/35 disable
set qos statistics export port 3/36 disable
set qos statistics export port 3/37 disable
set qos statistics export port 3/38 disable
set qos statistics export port 3/39 disable
set qos statistics export port 3/40 disable
set qos statistics export port 3/41 disable
set qos statistics export port 3/42 disable
set qos statistics export port 3/43 disable
set qos statistics export port 3/44 disable
set qos statistics export port 3/45 disable
set qos statistics export port 3/46 disable
set qos statistics export port 3/47 disable
set qos statistics export port 3/48 disable
set port debounce 3/1 disable
set port debounce 3/2 disable
set port debounce 3/3 disable
set port debounce 3/4 disable
```

```
set port debounce 3/5 disable
set port debounce 3/6 disable
set port debounce 3/7 disable
set port debounce 3/8 disable
set port debounce 3/9 disable
set port debounce 3/10 disable
set port debounce 3/11 disable
set port debounce 3/12 disable
set port debounce 3/13 disable
set port debounce 3/14 disable
set port debounce 3/15 disable
set port debounce 3/16 disable
set port debounce 3/17 disable
set port debounce 3/18 disable
set port debounce 3/19 disable
set port debounce 3/20 disable
set port debounce 3/21 disable
set port debounce 3/22 disable
set port debounce 3/23 disable
set port debounce 3/24 disable
set port debounce 3/25 disable
set port debounce 3/26 disable
set port debounce 3/27 disable
set port debounce 3/28 disable
set port debounce 3/29 disable
set port debounce 3/30 disable
set port debounce 3/31 disable
set port debounce 3/32 disable
set port debounce 3/33 disable
set port debounce 3/34 disable
set port debounce 3/35 disable
set port debounce 3/36 disable
set port debounce 3/37 disable
set port debounce 3/38 disable
set port debounce 3/39 disable
set port debounce 3/40 disable
set port debounce 3/41 disable
set port debounce 3/42 disable
set port debounce 3/43 disable
set port debounce 3/44 disable
set port debounce 3/45 disable
set port debounce 3/46 disable
set port debounce 3/47 disable
set port debounce 3/48 disable
set port unicast-flood 3/1-48 enable
set port errdisable-timeout 3/1-48 enable
set cam notification added disable 3/1-48
set cam notification removed disable 3/1-48
```

```
set port channel 3/1-48 mode auto silent

module 4 : 5-port Communication Media Mod.
set module name      4
set module enable    4
set vlan 1           4/2-5
set vlan 109         4/1
set port trap        4/1-5 disable
set port name        4/1-5
set port vtp 4/1-5 enable
set cdp enable       4/1-5
set spantree portcost 4/1 20000 mst
set spantree portcost 4/2-5 26843545 mst
set spantree portcost 4/1 4
set spantree portcost 4/2-5 1000
set spantree portpri 4/1-5 32
set spantree guard default 4/1-5
set port gvrp        4/1-5 disable
set gvrp registration normal 4/1-5
set gvrp applicant normal 4/1-5
set port gmrp        4/1-5 enable
set gmrp registration normal 4/1-5
set gmrp fwdall disable 4/1-5
set port jumbo 4/1-5 disable
set port arp-inspection 4/1 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/2 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/3 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/4 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 4/5 drop-threshold 0 shutdown-threshold 0
set cam notification added disable 4/1-5
set cam notification removed disable 4/1-5

module 5 : 5-port Communication Media Mod.
set module name      5
set module enable    5
set vlan 1           5/5
set vlan 109         5/1-4
set port trap        5/1-5 disable
set port name        5/1-5
set port vtp 5/1-5 enable
set cdp enable       5/1-5
set spantree portcost 5/1 20000 mst
set spantree portcost 5/2-5 26843545 mst
set spantree portcost 5/1 4
set spantree portcost 5/2-5 1000
set spantree portpri 5/1-5 32
set spantree guard default 5/1-5
set port gvrp        5/1-5 disable
```

```

set gvrp registration normal 5/1-5
set gvrp applicant normal 5/1-5
set port gmrp 5/1-5 enable
set gmrp registration normal 5/1-5
set gmrp fwdall disable 5/1-5
set port jumbo 5/1-5 disable
set port arp-inspection 5/1 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 5/2 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 5/3 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 5/4 drop-threshold 0 shutdown-threshold 0
set port arp-inspection 5/5 drop-threshold 0 shutdown-threshold 0
set cam notification added disable 5/1-5
set cam notification removed disable 5/1-5

module 6 empty

module 7 empty

module 8 empty

module 9 empty

module 15 empty

module 16 empty

switch port analyzer

cam
  set cam agingtime 1-2,10,101,103,105,107,109,113-115,804,888,901
  300
  set cam notification disable
  set cam notification interval 300
  set cam notification historysize 1
  set cam notification threshold disable
  set cam notification threshold limit 50
  set cam notification threshold interval 300
  set cam notification move disable

gvrp
  set gvrp dynamic-vlan-creation disable
  set gvrp disable

vlan verify-port-provisioning
  set vlan verify-port-provisioning disable

authorization
  set authorization exec disable console

```

```
set authorization exec disable telnet
set authorization enable disable console
set authorization enable disable telnet
set authorization commands disable console
set authorization commands disable telnet
```

Site2 Cisco Catalyst 3524 Access Switch

```
Device Configuration Viewer
ns2-3524

Global
! Last configuration change at 11:23:38 US_EDT Fri May 14 2004
! NVRAM config last updated at 17:02:59 US_EDT Thu May 13 2004
version 12.0
service nagle
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
hostname NS2-3524
clock timezone US_Eastern -5
clock summer-time US_EDT recurring
tftp-server c3500x1-c3h2s-mz.120-5.WC7.bin
banner motd "
GB-IPCC Test. Contact gb-ipcc@cisco.com
"
alias exec c conf t
alias exec r sh run
alias exec sri sh run interface
ntp clock-period 11259041
ntp server 10.12.2.1

Spanning-tree
spanning-tree vlan 209 priority 8192
no spanning-tree vlan 201
no spanning-tree vlan 202
no spanning-tree vlan 203

IP

IP-IP Global
ip subnet-zero
ip tftp source-interface VLAN1
ip domain-name ipcc.com
ip name-server 10.12.3.72
ip name-server 10.12.7.47
no ip http server

Interface

Interface-Interface FastEthernet0/1
interface FastEthernet0/1
```

```
description NS2-SIM1
duplex full
speed 100
switchport access vlan 202
spanning-tree portfast

Interface-Interface FastEthernet0/2
interface FastEthernet0/2
description NS2-CIL1
load-interval 30
duplex full
speed 100
switchport access vlan 203

Interface-Interface FastEthernet0/3
interface FastEthernet0/3
description NS2-3745-GW1
duplex full
speed 100
switchport access vlan 201

Interface-Interface FastEthernet0/4
interface FastEthernet0/4
description NS2-3745-GW2
duplex full
speed 100
switchport access vlan 201

Interface-Interface FastEthernet0/5
interface FastEthernet0/5
duplex full
speed 100

Interface-Interface FastEthernet0/6
interface FastEthernet0/6
duplex full
speed 100

Interface-Interface FastEthernet0/7
interface FastEthernet0/7
duplex full
speed 100

Interface-Interface FastEthernet0/8
interface FastEthernet0/8
duplex full
speed 100
```

```
Interface-Interface FastEthernet0/9
  interface FastEthernet0/9
  duplex full
  speed 100

Interface-Interface FastEthernet0/10
  interface FastEthernet0/10
  duplex full
  speed 100

Interface-Interface FastEthernet0/11
  interface FastEthernet0/11
  duplex full
  speed 100

Interface-Interface FastEthernet0/12
  interface FastEthernet0/12
  duplex full
  speed 100

Interface-Interface FastEthernet0/13
  interface FastEthernet0/13
  duplex full
  speed 100

Interface-Interface FastEthernet0/14
  interface FastEthernet0/14
  duplex full
  speed 100

Interface-Interface FastEthernet0/15
  interface FastEthernet0/15
  duplex full
  speed 100

Interface-Interface FastEthernet0/16
  interface FastEthernet0/16
  duplex full
  speed 100

Interface-Interface FastEthernet0/17
  interface FastEthernet0/17
  duplex full
  speed 100

Interface-Interface FastEthernet0/18
  interface FastEthernet0/18
  duplex full
```



```
speed 100

Interface-Interface FastEthernet0/19
interface FastEthernet0/19
duplex full
speed 100

Interface-Interface FastEthernet0/20
interface FastEthernet0/20
duplex full
speed 100
no cdp enable

Interface-Interface FastEthernet0/21
interface FastEthernet0/21
duplex full
speed 100

Interface-Interface FastEthernet0/22
interface FastEthernet0/22
duplex full
speed 100

Interface-Interface FastEthernet0/23
interface FastEthernet0/23
description link to NS2-2691 f0/0
duplex full
speed 100
switchport trunk allowed vlan 1,2,201-205,1002-1005
switchport mode trunk

Interface-Interface FastEthernet0/24
interface FastEthernet0/24
description link to CAT5K 6/1
duplex full
speed 100
switchport trunk allowed vlan 1,2,204,205,1002-1005
switchport mode trunk

Interface-Interface GigabitEthernet0/1
interface GigabitEthernet0/1

Interface-Interface GigabitEthernet0/2
interface GigabitEthernet0/2

Interface-Interface VLAN1
interface VLAN1
no ip address
```

```
no ip directed-broadcast
no ip route-cache
shutdown
```

```
Interface-Interface VLAN2
interface VLAN2
description management vlan
ip address 10.12.2.8 255.255.255.224
no ip directed-broadcast
no ip route-cache
```

```
SNMP
snmp-server engineID local 0000000902000004C1535D80
snmp-server community ***** RW
snmp-server system-shutdown
snmp-server enable traps snmp authentication linkdown linkup
coldstart
snmp-server enable traps vlan-membership
snmp-server enable traps config
snmp-server enable traps entity
snmp-server enable traps hsrp
snmp-server enable traps c2900
snmp-server enable traps mac-notification
snmp-server enable traps vtp
snmp-server enable traps cluster
```

```
Line
```

```
Line-Line con 0
line con 0
exec-timeout 30 0
privilege level 15
logging synchronous
transport input none
stopbits 1
```

```
Line-Line vty 0 4
line vty 0 4
exec-timeout 30 0
privilege level 15
no login
```

```
Line-Line vty 5 15
line vty 5 15
login
```

Call Flow Components Configuration Commands

This appendix provides a few sample configuration commands for components that are involved in the sample call flows discussed in [Chapter 4, “Tested Call Flows”](#). The configuration commands are listed by the type of call flow the components are involved with and are site-specific and site-relevant.

Site-specific physical and logical topology maps are provided in [Chapter 2, “Test Scenarios and Site Models”](#).

This appendix contains the following sections:

- [CCM Post-Routed Call Flow Components, page C-2](#)
- [ISN Post-Routed Call Flow Components, page C-30](#)
- [Outbound Option Call Flow Components, page C-99](#)

CCM Post-Routed Call Flow Components

Listed in this section are configuration commands for components such as gateways, gatekeepers, transcoders and conference bridges that are involved in handling the CCM Post-Routed call flow at Site1, Site2 and Site3.

- [Site1 Cisco Catalyst Series 6500 \(CMM\) Gateway, page C-2](#)
- [Site2 Cisco 3745 \(IOS\) Gateway, page C-11](#)
- [Site1 Cisco 3660 Gatekeeper 1, page C-18](#)
- [Site1 Cisco 3660 Gatekeeper 2, page C-22](#)
- [Site1 Cisco Catalyst Series 6500 \(Transcoder/Conference Bridge\), page C-26](#)

Site1 Cisco Catalyst Series 6500 (CMM) Gateway

```

building configuration...

Current configuration : 7373 bytes
!
! Last configuration change at 21:28:20 US_EDT Tue Aug 17 2004
! NVRAM config last updated at 21:28:35 US_EDT Tue Aug 17 2004
!
version 12.3
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
!
hostname ns1-cmm-gw1
!
boot-start-marker
boot-end-marker
!
logging buffered 50000000 debugging
no logging console
!
clock timezone EST -5
clock summer-time US_EDT recurring
no aaa new-model
ip subnet-zero
ip tcp synwait-time 13
ip ftp username nsite
ip ftp password lab

```



```
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
    !
  controller T1 1/5
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
    !
  controller T1 2/0
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
    !
  controller T1 2/1
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
    !
  controller T1 2/2
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
    !
  controller T1 2/3
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
    !
  controller T1 2/4
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
    !
  controller T1 2/5
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
    !
  controller T1 3/0
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
    !
  controller T1 3/1
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
    !
```

```
controller T1 3/2
  framing esf
  linecode b8zs
  pri-group timeslots 1-24 service mgcp
!
controller T1 3/3
  framing esf
  linecode b8zs
  pri-group timeslots 1-24 service mgcp
!
controller T1 3/4
  framing esf
  linecode b8zs
  pri-group timeslots 1-24 service mgcp
!
controller T1 3/5
  framing esf
  linecode b8zs
  pri-group timeslots 1-24 service mgcp
!
interface GigabitEthernet1/0
  ip address 10.12.3.133 255.255.255.224
  no ip proxy-arp
  no negotiation auto
  no keepalive
!
interface Serial1/0:23
  no ip address
  no logging event link-status
  isdn switch-type primary-dms100
  isdn incoming-voice voice
  isdn bind-l3 ccm-manager
  no cdp enable
!
interface Serial1/1:23
  no ip address
  no logging event link-status
  isdn switch-type primary-dms100
  isdn incoming-voice voice
  isdn bind-l3 ccm-manager
  no cdp enable
!
interface Serial1/2:23
  no ip address
  no logging event link-status
  isdn switch-type primary-dms100
  isdn incoming-voice voice
  isdn bind-l3 ccm-manager
```

```
no cdp enable
!
interface Serial1/3:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
isdn bind-l3 ccm-manager
no cdp enable
!
interface Serial1/4:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
isdn bind-l3 ccm-manager
no cdp enable
!
interface Serial1/5:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
isdn bind-l3 ccm-manager
no cdp enable
!
interface Serial2/0:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
isdn bind-l3 ccm-manager
no cdp enable
!
interface Serial2/1:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
isdn bind-l3 ccm-manager
no cdp enable
!
interface Serial2/2:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
isdn bind-l3 ccm-manager
```



```
no cdp enable
!
interface Serial2/3:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
isdn bind-l3 ccm-manager
no cdp enable
!
interface Serial2/4:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
isdn bind-l3 ccm-manager
no cdp enable
!
interface Serial2/5:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
isdn bind-l3 ccm-manager
no cdp enable
!
interface Serial3/0:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
isdn bind-l3 ccm-manager
no cdp enable
!
interface Serial3/1:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
isdn bind-l3 ccm-manager
no cdp enable
!
interface Serial3/2:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
isdn bind-l3 ccm-manager
```

```
no cdp enable
!
interface Serial3/3:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
isdn bind-l3 ccm-manager
no cdp enable
!
interface Serial3/4:23
no ip address
no logging event link-status
isdn switch-type primary-ni
isdn incoming-voice voice
isdn bind-l3 ccm-manager
no cdp enable
!
interface Serial3/5:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
isdn bind-l3 ccm-manager
no cdp enable
!
ip classless
ip route 0.0.0.0 0.0.0.0 10.12.3.129
no ip http server
!
!
control-plane
!
!
voice-port 1/0:23
echo-cancel coverage 64
!
voice-port 1/1:23
echo-cancel coverage 64
!
voice-port 1/2:23
echo-cancel coverage 64
!
voice-port 1/3:23
echo-cancel coverage 64
!
voice-port 1/4:23
echo-cancel coverage 64
```

```
!  
voice-port 1/5:23  
  echo-cancel coverage 64  
!  
voice-port 2/0:23  
  echo-cancel coverage 64  
!  
voice-port 2/1:23  
  echo-cancel coverage 64  
!  
voice-port 2/2:23  
  echo-cancel coverage 64  
!  
voice-port 2/3:23  
  echo-cancel coverage 64  
!  
voice-port 2/4:23  
  echo-cancel coverage 64  
!  
voice-port 2/5:23  
  echo-cancel coverage 64  
!  
voice-port 3/0:23  
  echo-cancel coverage 64  
!  
voice-port 3/1:23  
  echo-cancel coverage 64  
!  
voice-port 3/2:23  
  echo-cancel coverage 64  
!  
voice-port 3/3:23  
  echo-cancel coverage 64  
!  
voice-port 3/4:23  
  echo-cancel coverage 64  
!  
voice-port 3/5:23  
  echo-cancel coverage 64  
!  
mgcp  
mgcp call-agent NS1-CM1 2427 service-type mgcp version 0.1  
mgcp dtmf-relay voip codec all mode out-of-band  
mgcp rtp unreachable timeout 1000 action notify  
mgcp modem passthrough voip mode nse  
mgcp package-capability rtp-package  
no mgcp package-capability res-package  
mgcp package-capability sst-package
```

```
mgcp package-capability pre-package
no mgcp timer receive-rtcp
mgcp sdp simple
mgcp fax t38 inhibit
mgcp rtp payload-type g726r16 static
!
mgcp profile default
!
!
!
!
line con 0
  privilege level 15
  transport preferred all
  transport output all
line vty 0 4
  exec-timeout 0 0
  privilege level 15
  no login
  transport preferred all
  transport input all
  transport output all
!
exception protocol ftp
exception dump 10.12.13.212
ntp clock-period 17179976
ntp server 10.12.7.79
ntp server 10.12.3.138
!
end
```

Site2 Cisco 3745 (IOS) Gateway

```
Device Configuration Viewer
ns2-3745-gw1
```

```
Global
```

```
! Last configuration change at 17:45:20 EST Thu Jul 15 2004
! NVRAM config last updated at 17:45:35 EST Thu Jul 15 2004
version 12.3
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
hostname NS2-3745-GW1
boot-start-marker
boot system flash:c3745-ipvoice-mz.123-7.T
boot-end-marker
clock timezone EDT -5
clock summer-time EST recurring
no network-clock-participate slot 1
no network-clock-participate slot 2
no network-clock-participate slot 3
no network-clock-participate slot 4
no network-clock-participate wic 0
no network-clock-participate wic 1
no network-clock-participate wic 2
no network-clock-participate aim 0
no network-clock-participate aim 1
voice-card 1
dspfarm
voice-card 2
dspfarm
voice-card 3
dspfarm
voice-card 4
dspfarm
no aaa new-model
no ftp-server write-enable
isdn switch-type primary-dms100
ccm-manager redundant-host NS1-CM1
ccm-manager mgcp
ccm-manager music-on-hold
ccm-manager config server NS1-PUB
ccm-manager config
mgcp
mgcp call-agent NS1-CM2 2427 service-type mgcp version 0.1
mgcp rtp unreachable timeout 1000 action notify
mgcp package-capability rtp-package
```

```

no mgcp package-capability res-package
mgcp package-capability sst-package
no mgcp package-capability fxr-package
no mgcp timer receive-rtcp
mgcp sdp simple
mgcp fax t38 inhibit
mgcp rtp payload-type g726r16 static
mgcp profile default
ntp clock-period 17175705
ntp server 10.12.7.79
ntp server 10.12.3.138

```

IP

```

IP-IP Global
ip subnet-zero
ip cef
ip tcp synwait-time 13
ip ftp username Administrator
ip ftp password gbipcc
ip domain name ipcc.com
ip host gbipcc 172.18.141.128
ip name-server 10.12.3.72
ip name-server 10.12.7.47
ip classless
ip http server

```

Controller

```

Controller-Controller T1 1/0
controller T1 1/0
framing esf
linecode b8zs
pri-group timeslots 1-24 service mgcp

```

```

Controller-Controller T1 1/1
controller T1 1/1
framing esf
linecode b8zs
pri-group timeslots 1-24 service mgcp

```

```

Controller-Controller T1 2/0
controller T1 2/0
framing esf
linecode b8zs
pri-group timeslots 1-24 service mgcp

```

```

Controller-Controller T1 2/1

```

```
controller T1 2/1
framing esf
linecode b8zs
pri-group timeslots 1-24 service mgcp

Controller-Controller T1 3/0
controller T1 3/0
framing esf
linecode b8zs
pri-group timeslots 1-24 service mgcp

Controller-Controller T1 3/1
controller T1 3/1
framing esf
linecode b8zs
pri-group timeslots 1-24 service mgcp

Controller-Controller T1 4/0
controller T1 4/0
framing esf
linecode b8zs
pri-group timeslots 1-24 service mgcp

Controller-Controller T1 4/1
controller T1 4/1
framing esf
linecode b8zs
pri-group timeslots 1-24 service mgcp

Interface

Interface-Interface FastEthernet0/0
interface FastEthernet0/0
ip address 10.12.5.2 255.255.255.248
speed 100
full-duplex

Interface-Interface FastEthernet0/1
interface FastEthernet0/1
no ip address
shutdown
duplex auto
speed auto

Interface-Interface Serial1/0:23
interface Serial1/0:23
no ip address
no logging event link-status
```

```
isdn switch-type primary-dms100
isdn incoming-voice modem
isdn incoming-voice voice
isdn bind-13 ccm-manager
no cdp enable
```

```
Interface-Interface Serial1/1:23
interface Serial1/1:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice modem
isdn incoming-voice voice
isdn bind-13 ccm-manager
no cdp enable
```

```
Interface-Interface Serial2/0:23
interface Serial2/0:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice modem
isdn incoming-voice voice
isdn bind-13 ccm-manager
no cdp enable
```

```
Interface-Interface Serial2/1:23
interface Serial2/1:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice modem
isdn incoming-voice voice
isdn bind-13 ccm-manager
no cdp enable
```

```
Interface-Interface Serial3/0:23
interface Serial3/0:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice modem
isdn incoming-voice voice
isdn bind-13 ccm-manager
no cdp enable
```

```
Interface-Interface Serial3/1:23
interface Serial3/1:23
```



```
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice modem
isdn incoming-voice voice
isdn bind-l3 ccm-manager
no cdp enable

Interface-Interface Serial4/0:23
interface Serial4/0:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice modem
isdn incoming-voice voice
isdn bind-l3 ccm-manager
no cdp enable

Interface-Interface Serial4/1:23
interface Serial4/1:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice modem
isdn incoming-voice voice
isdn bind-l3 ccm-manager
no cdp enable

IP Routing

IP Routing-Routing ospf 1
router ospf 1
log-adjacency-changes
area 2 range 10.12.5.0 255.255.255.0
redistribute static subnets
network 10.12.5.0 0.0.0.255 area 2
network 10.12.17.0 0.0.0.255 area 0

SNMP
snmp-server community ***** RW
snmp-server chassis-id
snmp-server enable traps snmp authentication linkdown linkup
coldstart warmstart
snmp-server enable traps tty
snmp-server enable traps xgcp
snmp-server enable traps flash insertion removal
snmp-server enable traps envmon
snmp-server enable traps isdn call-information
```

```

snmp-server enable traps isdn layer2
snmp-server enable traps isdn chan-not-avail
snmp-server enable traps isdn ietf
snmp-server enable traps ds0-busyout
snmp-server enable traps dsl-loopback
snmp-server enable traps cnpd
snmp-server enable traps config
snmp-server enable traps dial
snmp-server enable traps dsp card-status
snmp-server enable traps entity
snmp-server enable traps frame-relay
snmp-server enable traps frame-relay subif
snmp-server enable traps hsrp
snmp-server enable traps ipmobile
snmp-server enable traps ipmulticast
snmp-server enable traps ospf state-change
snmp-server enable traps ospf errors
snmp-server enable traps ospf retransmit
snmp-server enable traps ospf lsa
snmp-server enable traps ospf cisco-specific state-change
snmp-server enable traps ospf cisco-specific errors
snmp-server enable traps ospf cisco-specific retransmit
snmp-server enable traps ospf cisco-specific lsa
snmp-server enable traps pim neighbor-change rp-mapping-change
invalid-pim-message
snmp-server enable traps pppoe
snmp-server enable traps cpu threshold
snmp-server enable traps rsvp
snmp-server enable traps rtr
snmp-server enable traps syslog
snmp-server enable traps l2tun session
snmp-server enable traps vtp
snmp-server enable traps voice poor-qov
snmp-server enable traps dnis

```

```

Control plane
control-plane

```

```

Voice-port

```

```

Voice-port-Voice-port 1/0:23
voice-port 1/0:23

```

```

Voice-port-Voice-port 1/1:23
voice-port 1/1:23

```

```

Voice-port-Voice-port 2/0:23
voice-port 2/0:23

```

```
Voice-port-Voice-port 2/1:23  
voice-port 2/1:23
```

```
Voice-port-Voice-port 3/0:23  
voice-port 3/0:23
```

```
Voice-port-Voice-port 3/1:23  
voice-port 3/1:23
```

```
Voice-port-Voice-port 4/0:23  
voice-port 4/0:23
```

```
Voice-port-Voice-port 4/1:23  
voice-port 4/1:23
```

```
Dial-peer
```

```
Dial-peer-Dial-peer cor custom  
dial-peer cor custom
```

```
Line
```

```
Line-Line con 0  
line con 0
```

```
Line-Line aux 0  
line aux 0
```

```
Line-Line vty 0 4  
line vty 0 4  
privilege level 15  
no login
```

```
Line-Line vty 5 1340  
line vty 5 1340  
privilege level 15  
no login
```

Site1 Cisco 3660 Gatekeeper 1

```

Device Configuration Viewer
ns1-gk1

Global
! Last configuration change at 16:00:13 EST Thu Jun 17 2004
! NVRAM config last updated at 16:00:20 EST Thu Jun 17 2004
version 12.3
no parser cache
service nagle
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
hostname NS1-3660-GK1
boot-start-marker
boot system flash:c3660-ix-mz.123-7.T
boot-end-marker
logging buffered 10000000 debugging
clock timezone EDT -5
clock summer-time EST recurring
no aaa new-model
voice call carrier capacity active
logging source-interface FastEthernet0/0
logging 10.12.13.210
zone cluster local ns3_cluster ns3cm-zone
element ns3cm-zone-bk 10.12.3.163 1719
zone cluster local ns4_cluster ns4cm-zone
element ns4cm-zone-bk 10.12.3.163 1719
zone cluster local ns7_cluster ns7cm-zone
element ns7cm-zone-bk 10.12.3.163 1719
zone prefix ns1cm-zone 1....
zone prefix ns1cm-zone 2....
zone prefix ns3cm-zone 3....
zone prefix ns4cm-zone 4....
zone prefix ns4cm-zone 5....
zone prefix ns4cm-zone 6....
zone prefix ns7cm-zone 7....
gw-type-prefix 1#* default-technology
arq reject-unknown-prefix
lrq forward-queries
timer cluster-element announce 25
load-balance cpu 80 memory 80
no shutdown
ntp clock-period 17180384
ntp server 10.12.7.79

```

```
ntp server 10.12.3.138

IP

IP-IP Global
  ip subnet-zero
  ip cef
  ip ftp username Administrator
  ip ftp password gbipcc
  no ip domain lookup
  ip domain name ipcc.com
  ip host gbipcc 172.18.141.128
  ip name-server 10.12.3.72
  ip name-server 10.12.7.47
  ip http server
  ip classless
  ip route 0.0.0.0 0.0.0.0 10.12.3.129

Interface

Interface-Interface FastEthernet0/0
  interface FastEthernet0/0
  description Connected to NS1-ASC1 3/4
  ip address 10.12.3.132 255.255.255.224
  speed 100
  full-duplex

Interface-Interface FastEthernet0/1
  interface FastEthernet0/1
  no ip address
  duplex auto
  speed auto

SNMP
  snmp-server community ***** RW
  snmp-server system-shutdown
  snmp-server enable traps snmp authentication linkdown linkup
coldstart warmstart
  snmp-server enable traps tty
  snmp-server enable traps gatekeeper
  snmp-server enable traps cnpd
  snmp-server enable traps isdn call-information
  snmp-server enable traps isdn layer2
  snmp-server enable traps isdn chan-not-avail
  snmp-server enable traps isdn ietf
  snmp-server enable traps hsrp
  snmp-server enable traps config
  snmp-server enable traps entity
```

```

snmp-server enable traps cpu threshold
snmp-server enable traps flash insertion removal
snmp-server enable traps envmon
snmp-server enable traps ds0-busyout
snmp-server enable traps dsl-loopback
snmp-server enable traps bgp
snmp-server enable traps ospf state-change
snmp-server enable traps ospf errors
snmp-server enable traps ospf retransmit
snmp-server enable traps ospf lsa
snmp-server enable traps ospf cisco-specific state-change
snmp-server enable traps ospf cisco-specific errors
snmp-server enable traps ospf cisco-specific retransmit
snmp-server enable traps ospf cisco-specific lsa
snmp-server enable traps pim neighbor-change rp-mapping-change
invalid-pim-message
snmp-server enable traps ipmulticast
snmp-server enable traps msdp
snmp-server enable traps rsvp
snmp-server enable traps frame-relay
snmp-server enable traps frame-relay subif
snmp-server enable traps rtr
snmp-server enable traps syslog
snmp-server enable traps dial
snmp-server enable traps voice poor-qov
snmp-server enable traps dnis

Control plane
control-plane

Dial-peer

Dial-peer-Dial-peer cor custom
dial-peer cor custom

Gatekeeper
gatekeeper
zone local ns1cm-zone ipcc.com 10.12.3.132
zone local ns3cm-zone ipcc.com
zone local ns4cm-zone ipcc.com
zone local ns7cm-zone ipcc.com
zone cluster local ns1_cluster ns1cm-zone
element ns1cm-zone-bk 10.12.3.163 1719

Line

Line-Line con 0
line con 0

```

```
privilege level 15
transport preferred all
transport output all

Line-Line aux 0
line aux 0
transport preferred all
transport output all

Line-Line vty 0 4
line vty 0 4
exec-timeout 0 0
privilege level 15
no login
transport preferred all
transport input all
transport output all
```

Site1 Cisco 3660 Gatekeeper 2

```

Device Configuration Viewer
ns1-gk2

Global
! Last configuration change at 16:16:11 EST Wed Aug 18 2004
! NVRAM config last updated at 16:16:12 EST Wed Aug 18 2004
version 12.3
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
hostname NS1-3660-GK2
boot-start-marker
boot system flash:c3660-ix-mz.123-7.T
boot-end-marker
logging buffered 10000000 debugging
no logging console
clock timezone EDT -5
clock summer-time EST recurring
no aaa new-model
zone cluster local ns3_cluster ns3cm-zone-bk
element ns3cm-zone 10.12.3.132 1719
zone cluster local ns4_cluster ns4cm-zone-bk
element ns4cm-zone 10.12.3.132 1719
zone cluster local ns7_cluster ns7cm-zone-bk
element ns7cm-zone 10.12.3.132 1719
zone prefix ns1cm-zone-bk 1....
zone prefix ns1cm-zone-bk 2....
zone prefix ns3cm-zone-bk 3....
zone prefix ns4cm-zone-bk 4....
zone prefix ns4cm-zone-bk 5....
zone prefix ns4cm-zone-bk 6....
zone prefix ns7cm-zone-bk 7....
gw-type-prefix 1#* default-technology
lrq forward-queries
timer cluster-element announce 25
load-balance cpu 80 memory 80
no shutdown
ntp clock-period 17180178
ntp server 10.12.7.79
ntp server 10.12.3.138

IP

IP-IP Global
ip subnet-zero

```



```
ip cef
ip ftp username Administrator
ip ftp password gbipcc
ip domain name ipcc.com
ip host gbipcc 172.18.141.128
ip name-server 10.12.3.72
ip name-server 10.12.7.47
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 10.12.3.161
```

Controller

```
Controller-Controller T1 2/0
  controller T1 2/0
  framing sf
  linecode ami
```

```
Controller-Controller T1 2/1
  controller T1 2/1
  framing sf
  linecode ami
```

```
Controller-Controller T1 2/2
  controller T1 2/2
  framing sf
  linecode ami
```

```
Controller-Controller T1 2/3
  controller T1 2/3
  framing sf
  linecode ami
```

Interface

```
Interface-Interface FastEthernet0/0
  interface FastEthernet0/0
  description Connected to NS1-ACS2 3/4
  ip address 10.12.3.163 255.255.255.224
  speed 100
  full-duplex
```

```
Interface-Interface FastEthernet0/1
  interface FastEthernet0/1
  no ip address
  shutdown
  duplex auto
  speed auto
```

```

SNMP
  snmp-server community ***** RW
  snmp-server enable traps snmp authentication linkdown linkup
coldstart warmstart
  snmp-server enable traps tty
  snmp-server enable traps gatekeeper
  snmp-server enable traps cnpd
  snmp-server enable traps isdn call-information
  snmp-server enable traps isdn layer2
  snmp-server enable traps isdn chan-not-avail
  snmp-server enable traps isdn ietf
  snmp-server enable traps hsrp
  snmp-server enable traps config
  snmp-server enable traps entity
  snmp-server enable traps cpu threshold
  snmp-server enable traps flash insertion removal
  snmp-server enable traps envmon
  snmp-server enable traps ds0-busyout
  snmp-server enable traps dsl-loopback
  snmp-server enable traps bgp
  snmp-server enable traps ospf state-change
  snmp-server enable traps ospf errors
  snmp-server enable traps ospf retransmit
  snmp-server enable traps ospf lsa
  snmp-server enable traps ospf cisco-specific state-change
  snmp-server enable traps ospf cisco-specific errors
  snmp-server enable traps ospf cisco-specific retransmit
  snmp-server enable traps ospf cisco-specific lsa
  snmp-server enable traps pim neighbor-change rp-mapping-change
invalid-pim-message
  snmp-server enable traps ipmulticast
  snmp-server enable traps msdp
  snmp-server enable traps rsvp
  snmp-server enable traps frame-relay
  snmp-server enable traps frame-relay subif
  snmp-server enable traps rtr
  snmp-server enable traps syslog
  snmp-server enable traps dial
  snmp-server enable traps voice poor-qov
  snmp-server enable traps dnis

Control plane
  control-plane

Dial-peer

Dial-peer-Dial-peer cor custom

```

```
dial-peer cor custom

Gatekeeper
gatekeeper
zone local ns1cm-zone-bk ipcc.com 10.12.3.163
zone local ns3cm-zone-bk ipcc.com
zone local ns4cm-zone-bk ipcc.com
zone local ns7cm-zone-bk ipcc.com
zone cluster local ns1_cluster ns1cm-zone-bk
element ns1cm-zone 10.12.3.132 1719

Line

Line-Line con 0
line con 0
privilege level 15
transport preferred all
transport output all

Line-Line aux 0
line aux 0
transport preferred all
transport output all

Line-Line vty 0 4
line vty 0 4
privilege level 15
no login
transport preferred all
transport input all
transport output all
```



```
no ip proxy-arp
full-duplex
!
interface FastEthernet1/0
ip address 10.12.3.136 255.255.255.255
no ip proxy-arp
full-duplex
!
interface GigabitEthernet1/0
ip address 10.12.3.134 255.255.255.224
no ip proxy-arp
no negotiation auto
no keepalive
!
interface FastEthernet2/0
ip address 10.12.3.137 255.255.255.255
no ip proxy-arp
full-duplex
!
ip classless
ip route 0.0.0.0 0.0.0.0 10.12.3.129
no ip http server
!
snmp-server community gbipcc RW
snmp-server enable traps snmp authentication linkdown linkup coldstart
warmstart
snmp-server enable traps tty
snmp-server enable traps xgcp
snmp-server enable traps dial
snmp-server enable traps isdn call-information
snmp-server enable traps isdn layer2
snmp-server enable traps isdn chan-not-avail
snmp-server enable traps isdn ietf
snmp-server enable traps hsrp
snmp-server enable traps config
snmp-server enable traps entity
snmp-server enable traps cpu threshold
snmp-server enable traps ipmulticast
snmp-server enable traps syslog
snmp-server enable traps dsp card-status
snmp-server enable traps envmon
snmp-server enable traps ds0-busyout
snmp-server enable traps ds1-loopback
snmp-server enable traps voice poor-qov
snmp-server enable traps dnis
!
control-plane
!
```

```

!
mgcp
!
mediacard 1
  resource-pool summit-1 dsps 4
!
mediacard 2
  resource-pool summit-2 dsps 4
!
mediacard 3
  resource-pool summit-3 dsps 4
!
!
sccp local GigabitEthernet1/0
sccp ccm 10.12.3.20 identifier 4
sccp ccm 10.12.3.18 identifier 3
sccp ccm 10.12.3.5 identifier 2
sccp ccm 10.12.3.3 identifier 1
sccp
!
sccp ccm group 2
  associate ccm 3 priority 2
  associate ccm 4 priority 1
  associate profile 2 register MTP0003feadc8fc
!
sccp ccm group 1
  associate ccm 2 priority 2
  associate ccm 1 priority 1
  associate profile 1 register CFB0003feadc8fb
!
sccp ccm group 3
  associate ccm 1 priority 2
  associate ccm 2 priority 1
  associate profile 3 register CFB0003feadc8fd
!
dspfarm
!
dspfarm profile 3 conference adhoc
  rtp timeout 60
  codec g711ulaw packetization-period 30
  codec g711alaw packetization-period 30
  codec g729r8 packetization-period 30
  codec g729ar8 packetization-period 30
  codec g723r63 packetization-period 30
  codec g723r53 packetization-period 30
  associate resource-pool summit-3
!
dspfarm profile 1 conference adhoc

```

```
    rtp timeout 60
    codec g711ulaw packetization-period 30
    codec g711alaw packetization-period 30
    codec g729r8 packetization-period 30
    codec g729ar8 packetization-period 30
    codec g723r63 packetization-period 30
    codec g723r53 packetization-period 30
    associate resource-pool summit-1
!
dspfarm profile 2 transcode
    rtp timeout 60
    codec g711ulaw packetization-period 30
    codec g711alaw packetization-period 30
    codec g729r8 packetization-period 30
    codec g729ar8 packetization-period 30
    codec g723r63 packetization-period 30
    codec g723r53 packetization-period 30
    associate resource-pool summit-2
!
!
!
line con 0
    privilege level 15
    transport preferred all
    transport output all
line vty 0 4
    privilege level 15
    no login
    transport preferred all
    transport input all
    transport output all
!
ntp clock-period 17179889
ntp server 10.12.7.79
ntp server 10.12.3.138
!
end
```

ISN Post-Routed Call Flow Components

Listed in this section are configuration commands for components such as gateways (VXML-enabled), gatekeepers, and content switches that are involved in handling the ISN Post-Routed Call Flow at Site4, Site5, Site6, and Site7.

- [Site4 Cisco AS5400HPX \(VXML\) Gateway, page C-30](#)
- [Site5 Cisco 1760 \(VXML\) Gateway, page C-39](#)
- [Site5 Cisco 3745 \(VXML\) Gateway, page C-45](#)
- [Site6 Cisco 1751 \(VXML\) Gateway, page C-52](#)
- [Site6 Cisco 3640A \(VXML\) Gateway, page C-58](#)
- [Site7 Cisco 1751 \(VXML\) Gateway, page C-65](#)
- [Site7 Cisco 1760 \(VXML\) Gateway, page C-70](#)
- [Site7 Cisco AS5350 \(VXML\) Gateway, page C-75](#)
- [Site7 Cisco AS5400 \(VXML\) Gateway, page C-81](#)
- [Site4 Cisco 3660 Gatekeeper 1, page C-88](#)
- [Site4 Cisco 3660 Gatekeeper 2, page C-92](#)
- [Site4 Cisco 11501 Content Switch, page C-96](#)

Site4 Cisco AS5400HPX (VXML) Gateway

```
Building configuration...

Current configuration : 7554 bytes
!
! Last configuration change at 16:04:46 EST Tue Aug 3 2004
!
version 12.3
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
!
hostname NS4-5400-GW1
!
boot-start-marker
boot system flash:c5400-is-mz.123-7.T1.bin
no boot startup-test
```



```
boot-end-marker
!
logging buffered 1000000 debugging
enable password lab
!
!
!
resource-pool disable
clock timezone EDT -5
clock summer-time EST recurring
tdm clock priority 1 7/1
spe default-firmware spe-firmware-1
no aaa new-model
ip subnet-zero
!
!
ip cef
ip domain name ipcc.com
ip host asr-en 10.12.7.82
ip host media 10.12.7.44
ip host media-backup 10.12.7.44
ip host isn-vxml 10.12.7.80
ip name-server 10.12.7.47
ip name-server 10.12.3.72
!
!
isdn switch-type primary-dms100
!
!
voice service voip
  fax protocol t38 ls-redundancy 0 hs-redundancy 0 fallback cisco
  h323
!
!
voice class codec 1
  codec preference 1 g711ulaw
  codec preference 2 g729r8
!
!
!
voice class h323 1
  h225 timeout tcp establish 3
!
!
!
!
!
```

```
!  
!  
!  
!  
!  
controller T1 6/0  
    framing esf  
    linecode b8zs  
!  
controller T1 6/1  
    framing esf  
    linecode b8zs  
!  
controller T1 6/2  
    framing esf  
    linecode b8zs  
!  
controller T1 6/3  
    framing esf  
    linecode b8zs  
!  
controller T1 6/4  
    framing esf  
    linecode b8zs  
!  
controller T1 6/5  
    framing esf  
    linecode b8zs  
!  
controller T1 6/6  
    framing esf  
    linecode b8zs  
!  
controller T1 6/7  
    framing esf  
    linecode b8zs  
!  
controller T1 7/0  
    framing esf  
    linecode b8zs  
    pri-group timeslots 1-24  
!  
controller T1 7/1  
    framing esf  
    linecode b8zs  
    pri-group timeslots 1-24  
!  
controller T1 7/2
```

```
framing esf
linecode b8zs
pri-group timeslots 1-24
!
controller T1 7/3
framing esf
linecode b8zs
pri-group timeslots 1-24
!
controller T1 7/4
framing esf
linecode b8zs
pri-group timeslots 1-24
!
controller T1 7/5
framing esf
linecode b8zs
!
controller T1 7/6
framing esf
linecode b8zs
!
controller T1 7/7
framing esf
linecode b8zs
!
!
interface FastEthernet0/0
ip address 10.12.7.70 255.255.255.224
logging event link-status
duplex full
speed 100
h323-gateway voip interface
h323-gateway voip id ns4-isn-zone ipaddr 10.12.7.69 1719
h323-gateway voip h323-id NS4-5400-GW1
h323-gateway voip tech-prefix 1#
!
interface FastEthernet0/1
no ip address
shutdown
duplex auto
speed auto
!
interface Serial0/0
no ip address
shutdown
clockrate 2000000
!
```

```
interface Serial6/0
  no ip address
  shutdown
!
interface Serial7/0
  no ip address
  shutdown
!
interface Serial0/1
  no ip address
  shutdown
  clockrate 2000000
!
interface Serial7/0:23
  no ip address
  isdn switch-type primary-dms100
  isdn protocol-emulate network
  isdn incoming-voice modem
  isdn bchan-number-order descending
  no cdp enable
!
interface Serial7/1:23
  no ip address
  isdn switch-type primary-dms100
  isdn incoming-voice modem
  no cdp enable
!
interface Serial7/2:23
  no ip address
  isdn switch-type primary-dms100
  isdn incoming-voice modem
  no cdp enable
!
interface Serial7/3:23
  no ip address
  isdn switch-type primary-dms100
  isdn incoming-voice modem
  no cdp enable
!
interface Serial7/4:23
  no ip address
  isdn switch-type primary-dms100
  isdn incoming-voice modem
  no cdp enable
!
interface Group-Async0
  no ip address
  group-range 1/00 5/107
```

```

!
ip classless
ip route 0.0.0.0 0.0.0.0 10.12.7.65
no ip http server
!
!
!
snmp-server community gbipcc RW
snmp-server system-shutdown
snmp-server enable traps snmp authentication linkdown linkup coldstart
warmstart
snmp-server enable traps calltracker
snmp-server enable traps tty
snmp-server enable traps xgcp
snmp-server enable traps modem-health
snmp-server enable traps ds0-busyout
snmp-server enable traps ds1-loopback
snmp-server enable traps cnpd
snmp-server enable traps isdn call-information
snmp-server enable traps isdn layer2
snmp-server enable traps isdn chan-not-avail
snmp-server enable traps isdn ietf
snmp-server enable traps fru-ctrl
snmp-server enable traps flash insertion removal
snmp-server enable traps hsrp
snmp-server enable traps config
snmp-server enable traps entity
snmp-server enable traps cpu threshold
snmp-server enable traps envmon
snmp-server enable traps aaa_server
snmp-server enable traps bgp
snmp-server enable traps ospf state-change
snmp-server enable traps ospf errors
snmp-server enable traps ospf retransmit
snmp-server enable traps ospf lsa
snmp-server enable traps ospf cisco-specific state-change
snmp-server enable traps ospf cisco-specific errors
snmp-server enable traps ospf cisco-specific retransmit
snmp-server enable traps ospf cisco-specific lsa
snmp-server enable traps pim neighbor-change rp-mapping-change
invalid-pim-messa
ge
snmp-server enable traps ipmulticast
snmp-server enable traps msdp
snmp-server enable traps rsvp
snmp-server enable traps frame-relay
snmp-server enable traps frame-relay subif
snmp-server enable traps rtr

```

```
snmp-server enable traps syslog
snmp-server enable traps stun
snmp-server enable traps dlsw
snmp-server enable traps bstun
snmp-server enable traps pppoe
snmp-server enable traps l2tun session
snmp-server enable traps dial
snmp-server enable traps dsp card-status
snmp-server enable traps voice poor-qov
snmp-server enable traps dnis
!
!
!
control-plane
!
!
call application voice survivability flash:survivability.tcl
call application voice survivability after-hours-agent0 40100
call application voice survivability language 0 en
call application voice survivability set-location en 0 flash
!
call application voice handoff flash:handoff.tcl
call application voice handoff language 0 en
call application voice handoff set-location en 0 flash
!
call application voice new-call flash:bootstrap.vxml
call application voice new-call language 0 en
call application voice new-call set-location en 0 flash
!
call application voice vru-leg flash:Bootstrap.tcl
call application voice vru-leg language 0 en
call application voice vru-leg set-location en 0 flash
!
!
voice-port 7/0:D
!
voice-port 7/1:D
!
voice-port 7/2:D
!
voice-port 7/3:D
!
voice-port 7/4:D
!
!
dial-peer cor custom
!
!
```

```
!  
dial-peer voice 2 pots  
  application survivability  
  incoming called-number 15209209100  
  no digit-strip  
  direct-inward-dial  
!  
dial-peer voice 1 pots  
  application survivability  
  incoming called-number 15209209100  
  no digit-strip  
  direct-inward-dial  
!  
dial-peer voice 3 pots  
  application survivability  
  incoming called-number 15209209100  
  no digit-strip  
  direct-inward-dial  
!  
dial-peer voice 4 pots  
  application vru-leg  
  incoming called-number 4444T  
  no digit-strip  
  direct-inward-dial  
!  
dial-peer voice 4000 voip  
  destination-pattern 49100  
  voice-class codec 1  
  voice-class h323 1  
  session target ras  
  tech-prefix 2#  
  dtmf-relay rtp-nte h245-signal h245-alphanumeric  
  no vad  
!  
dial-peer voice 44444 voip  
  application vru-leg  
  incoming called-number 4444T  
  dtmf-relay rtp-nte h245-signal h245-alphanumeric  
  codec g711ulaw  
  no vad  
!  
dial-peer voice 49100 pots  
  application survivability  
  incoming called-number 15209209100  
  direct-inward-dial  
  port 7/0:D  
!  
!
```

```
num-exp 1520920.... 49100
gateway
!
ss7 mtp2-variant Bellcore 0
ss7 mtp2-variant Bellcore 1
ss7 mtp2-variant Bellcore 2
ss7 mtp2-variant Bellcore 3
alias exec c conf t
alias exec sri sh run int
!
line con 0
  exec-timeout 0 0
line aux 0
  exec-timeout 0 0
line vty 0 4
  exec-timeout 0 0
  privilege level 15
  password lab
  login
line 1/00 2/59
  no flush-at-activation
  modem InOut
line 3/00 3/107
  no flush-at-activation
  modem InOut
line 5/00 5/107
  no flush-at-activation
  modem InOut
!
scheduler allocate 10000 400
ntp clock-period 17180079
ntp server 10.12.7.79
ntp server 10.12.3.138
!
end
```


Site5 Cisco 1760 (VXML) Gateway

```
Building configuration...

Current configuration : 5678 bytes
!
! Last configuration change at 17:20:06 EST Tue Aug 10 2004
! NVRAM config last updated at 17:20:06 EST Tue Aug 10 2004
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname NS5-1760-GW1
!
boot-start-marker
boot system flash:c1700-sv8y7-mz.123-7.T1.bin
boot-end-marker
!
logging buffered 1000000 debugging
no logging console
!
clock timezone EDT -5
clock summer-time EST recurring
tdm clock T1 0/0 both export line
tdm clock T1 0/1 both import T1 0/0 internal
mmi polling-interval 60
no mmi auto-configure
no mmi pvc
mmi snmp-timeout 180
voice-card 0
!
voice-card 1
!
no aaa new-model
ip subnet-zero
!
!
ip tftp source-interface FastEthernet0/0
ip ftp source-interface FastEthernet0/0
ip ftp username Administrator
ip ftp password gbipcc
ip domain name ipcc.com
ip host gbipcc 172.18.141.128
ip host media-backup 10.12.7.44
ip host isn-vxml 10.12.7.80
```



```
framing esf
linecode b8zs
!
!
!
interface FastEthernet0/0
description connected to NS5-3524 0/8 via L3-65 & J14
ip address 10.12.8.3 255.255.255.248
speed 100
full-duplex
h323-gateway voip interface
h323-gateway voip id ns4-isn-zone ipaddr 10.12.7.69 1719
h323-gateway voip h323-id NS5-1760-GW1
h323-gateway voip tech-prefix 1#
!
interface Serial0/0:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
no cdp enable
!
interface Serial0/1:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
no cdp enable
!
ip classless
ip route 0.0.0.0 0.0.0.0 10.12.8.1
no ip http server
!
!
!
snmp-server community gbipcc RW
snmp-server system-shutdown
snmp-server enable traps snmp authentication linkdown linkup coldstart
warmstart
snmp-server enable traps tty
snmp-server enable traps xgcp
snmp-server enable traps aaa_server
snmp-server enable traps isdn call-information
snmp-server enable traps isdn layer2
snmp-server enable traps isdn chan-not-avail
snmp-server enable traps isdn ietf
snmp-server enable traps hsrp
snmp-server enable traps config
```

```

snmp-server enable traps entity
snmp-server enable traps cpu threshold
snmp-server enable traps flash insertion removal
snmp-server enable traps frame-relay
snmp-server enable traps frame-relay subif
snmp-server enable traps ospf state-change
snmp-server enable traps ospf errors
snmp-server enable traps ospf retransmit
snmp-server enable traps ospf lsa
snmp-server enable traps ospf cisco-specific state-change
snmp-server enable traps ospf cisco-specific errors
snmp-server enable traps ospf cisco-specific retransmit
snmp-server enable traps ospf cisco-specific lsa
snmp-server enable traps syslog
snmp-server enable traps cnpd
snmp-server enable traps rtr
snmp-server enable traps atm subif
snmp-server enable traps pim neighbor-change rp-mapping-change
invalid-pim-messa
ge
snmp-server enable traps ipmulticast
snmp-server enable traps msdp
snmp-server enable traps rsvp
snmp-server enable traps pppoe
snmp-server enable traps l2tun session
snmp-server enable traps bgp
snmp-server enable traps ipmobile
snmp-server enable traps dial
snmp-server enable traps dsp card-status
snmp-server enable traps voice poor-qov
snmp-server enable traps dnis
!
!
control-plane
!
call treatment on
call threshold global cpu-avg low 60 high 85
call threshold global total-mem low 60 high 90
call threshold global proc-mem low 60 high 85
!
call application voice survivability flash:survivability.tcl
call application voice survivability after-hours-agent0 50100
call application voice survivability language 0 en
call application voice survivability set-location en 0 flash
!
call application voice new-call flash:bootstrap.vxml
call application voice new-call language 0 en
call application voice new-call set-location en 0 flash

```

```
!
call application voice vru-leg flash:Bootstrap.tcl
call application voice vru-leg language 0 en
call application voice vru-leg set-location en 0 flash
!
call application voice handoff flash:handoff.tcl
call application voice handoff language 0 en
call application voice handoff set-location en 0 flash
!
voice-port 0/0:23
!
voice-port 0/1:23
!
!
dial-peer cor custom
!
!
!
dial-peer voice 1 pots
  application survivability
  incoming called-number 8139569100
  no digit-strip
  direct-inward-dial
  port 0/0:23
!
dial-peer voice 2 pots
  application survivability
  incoming called-number 8139569100
  no digit-strip
  direct-inward-dial
  port 0/1:23
!
dial-peer voice 302 voip
  destination-pattern 59100
  voice-class codec 1
  session target ras
  tech-prefix 2#
  dtmf-relay rtp-nte h245-signal h245-alphanumeric
  no vad
!
dial-peer voice 4444 voip
  application vru-leg
  incoming called-number 4444T
  dtmf-relay rtp-nte h245-signal h245-alphanumeric
  codec g711ulaw
  no vad
!
num-exp 813956.... 59100
```

```
gateway
!
!
line con 0
  exec-timeout 0 0
line aux 0
line vty 0 4
  exec-timeout 0 0
  privilege level 15
  password lab
  login
!
ntp clock-period 17208089
ntp server 10.12.7.79
!
end
```

Site5 Cisco 3745 (VXML) Gateway

```
Building configuration...

Current configuration : 6983 bytes
!
! Last configuration change at 16:33:03 EST Fri Aug 13 2004
! NVRAM config last updated at 16:33:03 EST Fri Aug 13 2004
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname NS5-3745-GW1
!
boot-start-marker
boot system flash:c3745-ipvoice-mz.123-7.T1.bin
boot-end-marker
!
logging buffered 1000000 debugging
no logging console
!
clock timezone EDT -5
clock summer-time EST recurring
no network-clock-participate slot 1
no network-clock-participate slot 2
no network-clock-participate slot 3
no network-clock-participate slot 4
no network-clock-participate wic 0
no network-clock-participate wic 1
no network-clock-participate wic 2
no network-clock-participate aim 0
no network-clock-participate aim 1
voice-card 1
  dspfarm
!
voice-card 2
  dspfarm
!
voice-card 3
  dspfarm
!
no aaa new-model
ip subnet-zero
ip cef
!
```

```
!  
!  
!  
ip ftp source-interface FastEthernet0/0  
ip ftp username Administrator  
ip ftp password gbipcc  
ip tftp source-interface FastEthernet0/0  
ip domain name ipcc.com  
ip host gbipcc 172.18.141.128  
ip host media-backup 10.12.7.44  
ip host isn-vxml 10.12.7.80  
ip host asr-en-us 10.12.8.19  
ip host asr-en-us-backup 10.12.8.19  
ip host tts-en-us 10.12.8.19  
ip host tts-en-us-backup 10.12.8.19  
ip host media 10.12.8.21  
ip name-server 10.12.3.72  
ip name-server 10.12.7.47  
no ftp-server write-enable  
isdn switch-type primary-dms100  
!  
!  
!  
voice service voip  
  fax protocol t38 ls-redundancy 0 hs-redundancy 0 fallback cisco  
  h323  
  call start slow  
!  
!  
voice class codec 1  
  codec preference 1 g711ulaw  
  codec preference 2 g729r8  
!  
!  
!  
voice class h323 1  
  h225 timeout tcp establish 3  
!  
!  
!  
!  
!  
!  
!  
!  
controller T1 1/0  
  framing esf
```



```
    linecode b8zs
    pri-group timeslots 1-24
!
controller T1 1/1
    framing esf
    linecode b8zs
    pri-group timeslots 1-24
!
controller T1 2/0
    framing esf
    linecode b8zs
    pri-group timeslots 1-24
!
controller T1 2/1
    framing esf
    linecode b8zs
    pri-group timeslots 1-24
!
controller T1 3/0
    framing esf
    linecode b8zs
    pri-group timeslots 1-24
!
controller T1 3/1
    framing sf
    linecode ami
!
!
!
interface FastEthernet0/0
    ip address 10.12.8.2 255.255.255.248
    speed 100
    full-duplex
    h323-gateway voip interface
    h323-gateway voip id ns4-isn-zone ipaddr 10.12.7.69 1719
    h323-gateway voip h323-id NS5-3745-GW1
    h323-gateway voip tech-prefix 1#
!
interface FastEthernet0/1
    no ip address
    shutdown
    duplex auto
    speed auto
!
interface Serial1/0:23
    no ip address
    no logging event link-status
    isdn switch-type primary-dms100
```

```

    isdn incoming-voice voice
    no cdp enable
    !
interface Serial1/1:23
    no ip address
    no logging event link-status
    isdn switch-type primary-dms100
    isdn incoming-voice voice
    no cdp enable
    !
interface Serial2/0:23
    no ip address
    no logging event link-status
    isdn switch-type primary-dms100
    isdn incoming-voice voice
    no cdp enable
    !
interface Serial2/1:23
    no ip address
    no logging event link-status
    isdn switch-type primary-dms100
    isdn incoming-voice voice
    no cdp enable
    !
interface Serial3/0:23
    no ip address
    no logging event link-status
    isdn switch-type primary-dms100
    isdn incoming-voice voice
    no cdp enable
    !
ip classless
ip route 0.0.0.0 0.0.0.0 10.12.8.1
ip http server
    !
    !
snmp-server community gbipcc RW
snmp-server chassis-id
snmp-server system-shutdown
snmp-server enable traps snmp authentication linkdown linkup coldstart
warmstar
snmp-server enable traps tty
snmp-server enable traps xgcp
snmp-server enable traps flash insertion removal
snmp-server enable traps envmon
snmp-server enable traps isdn call-information
snmp-server enable traps isdn layer2
snmp-server enable traps isdn chan-not-avail

```

```

snmp-server enable traps isdn ietf
snmp-server enable traps ds0-busyout
snmp-server enable traps ds1-loopback
snmp-server enable traps cnpd
snmp-server enable traps config
snmp-server enable traps dial
snmp-server enable traps dsp card-status
snmp-server enable traps entity
snmp-server enable traps frame-relay
snmp-server enable traps frame-relay subif
snmp-server enable traps hsrp
snmp-server enable traps ipmobile
snmp-server enable traps ipmulticast
snmp-server enable traps ospf state-change
snmp-server enable traps ospf errors
snmp-server enable traps ospf retransmit
snmp-server enable traps ospf lsa
snmp-server enable traps ospf cisco-specific state-change
snmp-server enable traps ospf cisco-specific errors
snmp-server enable traps ospf cisco-specific retransmit
snmp-server enable traps ospf cisco-specific lsa
snmp-server enable traps pim neighbor-change rp-mapping-change
invalid-pim-mess
ge
snmp-server enable traps pppoe
snmp-server enable traps cpu threshold
snmp-server enable traps rsvp
snmp-server enable traps rtr
snmp-server enable traps syslog
snmp-server enable traps l2tun session
snmp-server enable traps vtp
snmp-server enable traps voice poor-qov
snmp-server enable traps dnis
!
!
!
control-plane
!
!
call application voice handoff flash:handoff.tcl
call application voice handoff language 0 en
call application voice handoff set-location en 0 flash
!
call application voice new-call flash:bootstrap.vxml
call application voice new-call language 0 en
call application voice new-call set-location en 0 flash
!
call application voice vru-leg flash:Bootstrap.tcl

```

```

call application voice vru-leg language 0 en
call application voice vru-leg set-location en 0 flash
!
call application voice survivability flash:survivability.tcl
call application voice survivability after-hours-agent0 50100
call application voice survivability language 0 en
call application voice survivability set-location en 0 flash
call threshold global cpu-avg low 60 high 85
call threshold global total-mem low 60 high 90
call threshold global proc-mem low 60 high 85
call treatment on
!
!
voice-port 1/0:23
!
voice-port 1/1:23
!
voice-port 2/0:23
!
voice-port 2/1:23
!
voice-port 3/0:23
!
!
!
!
dial-peer cor custom
!
!
!
dial-peer voice 1 pots
  application survivability
  incoming called-number 8139569100
  no digit-strip
  direct-inward-dial
  port 1/0:23
!
dial-peer voice 2 pots
  application survivability
  incoming called-number 8139569100
  no digit-strip
  direct-inward-dial
  port 1/1:23
!
dial-peer voice 3 pots
  application survivability
  incoming called-number 8139569100
  no digit-strip

```

```
direct-inward-dial
port 2/0:23
!
dial-peer voice 4 pots
application survivability
incoming called-number 8139569100
no digit-strip
direct-inward-dial
port 2/1:23
!
dial-peer voice 302 voip
destination-pattern 59100
voice-class codec 1
session target ras
tech-prefix 2#
dtmf-relay rtp-nte h245-signal h245-alphanumeric
no vad
!
dial-peer voice 44444 voip
application vru-leg
incoming called-number 4444T
dtmf-relay rtp-nte h245-signal h245-alphanumeric
codec g711ulaw
no vad
!
num-exp 813956.... 59100
gateway
!
!
line con 0
exec-timeout 0 0
privilege level 15
line aux 0
line vty 0 4
exec-timeout 0 0
privilege level 15
password lab
login
!
ntp clock-period 17175521
ntp server 10.12.7.79
!
end
```

Site6 Cisco 1751 (VXML) Gateway

```

Building configuration...

Current configuration : 5625 bytes
!
! Last configuration change at 16:31:30 EST Fri Aug 13 2004
! NVRAM config last updated at 16:31:31 EST Fri Aug 13 2004
!
version 12.3
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
!
hostname NS6-1751-GW1
!
boot-start-marker
boot system flash:c1700-sv8y7-mz.123-7.T1.bin
boot-end-marker
!
logging buffered 1000000 debugging
no logging console
enable secret 5 $1$C3nD$qnQw1EN8aa97d.LM8gp.K.
!
memory-size iomem 20
clock timezone EDT -5
clock summer-time EST recurring
tdm clock T1 0/0 both export line
tdm clock T1 1/0 both import T1 0/0 internal
mmi polling-interval 60
no mmi auto-configure
no mmi pvc
mmi snmp-timeout 180
voice-card 0
!
voice-card 1
!
no aaa new-model
ip subnet-zero
!
!
ip ftp username Administrator
ip ftp password gbipcc
ip domain name ipcc.com
ip host gbipcc 172.18.141.128
ip host isn-vxml 10.12.7.80
ip host media 10.12.7.44

```



```

!
interface FastEthernet0/0
description Connection to NS6-3524 FA 0/5
ip address 10.12.9.3 255.255.255.248
speed 100
full-duplex
h323-gateway voip interface
h323-gateway voip id ns4-isn-zone ipaddr 10.12.7.69 1719
h323-gateway voip h323-id NS6-1751-GW1
h323-gateway voip tech-prefix 1#
!
interface Serial0/0:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
no cdp enable
!
interface Serial1/0:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
no cdp enable
!
ip classless
ip route 0.0.0.0 0.0.0.0 10.12.9.1
ip http server
ip http authentication local
!
!
!
snmp-server community gbipcc RW
snmp-server enable traps snmp authentication linkdown linkup coldstart
warmstar
snmp-server enable traps tty
snmp-server enable traps xgcp
snmp-server enable traps aaa_server
snmp-server enable traps isdn call-information
snmp-server enable traps isdn layer2
snmp-server enable traps isdn chan-not-avail
snmp-server enable traps isdn ietf
snmp-server enable traps hsrp
snmp-server enable traps config
snmp-server enable traps entity
snmp-server enable traps cpu threshold
snmp-server enable traps flash insertion removal
snmp-server enable traps frame-relay

```



```
snmp-server enable traps frame-relay subif
snmp-server enable traps ospf state-change
snmp-server enable traps ospf errors
snmp-server enable traps ospf retransmit
snmp-server enable traps ospf lsa
snmp-server enable traps ospf cisco-specific state-change
snmp-server enable traps ospf cisco-specific errors
snmp-server enable traps ospf cisco-specific retransmit
snmp-server enable traps ospf cisco-specific lsa
snmp-server enable traps syslog
snmp-server enable traps cnpd
snmp-server enable traps rtr
snmp-server enable traps atm subif
snmp-server enable traps pim neighbor-change rp-mapping-change
invalid-pim-mess
ge
snmp-server enable traps ipmulticast
snmp-server enable traps rsvp
snmp-server enable traps pppoe
snmp-server enable traps l2tun session
snmp-server enable traps ipmobile
snmp-server enable traps dial
snmp-server enable traps dsp card-status
snmp-server enable traps voice poor-qov
snmp-server enable traps dnis
!
!
control-plane
!
call treatment on
call threshold global cpu-avg low 60 high 85
call threshold global total-mem low 60 high 90
call threshold global proc-mem low 60 high 85
!
call application voice handoff flash:handoff.tcl
call application voice handoff language 0 en
call application voice handoff set-location en 0 flash
!
call application voice new-call flash:bootstrap.vxml
call application voice new-call language 0 en
call application voice new-call set-location en 0 flash
!
call application voice vru-leg flash:Bootstrap.tcl
call application voice vru-leg language 0 en
call application voice vru-leg set-location en 0 flash
!
call application voice survivability flash:survivability.tcl
call application voice survivability after-hours-agent0 60100
```

```
call application voice survivability language 0 en
call application voice survivability set-location en 0 flash
!
voice-port 0/0:23
!
voice-port 1/0:23
!
!
!
dial-peer voice 617 voip
 destination-pattern 69100
 voice-class codec 1
 session target ras
 tech-prefix 2#
 dtmf-relay rtp-nte h245-signal h245-alphanumeric
 no vad
!
dial-peer voice 1 pots
 application survivability
 incoming called-number 5609609100
 no digit-strip
 direct-inward-dial
 port 0/0:23
!
dial-peer voice 2 pots
 application survivability
 incoming called-number 5609609100
 no digit-strip
 direct-inward-dial
 port 1/0:23
!
dial-peer voice 44444 voip
 application vru-leg
 incoming called-number 4444T
 dtmf-relay rtp-nte h245-signal h245-alphanumeric
 codec g711ulaw
 no vad
!
num-exp 560960.... 69100
gateway
!
!
line con 0
 exec-timeout 30 0
 privilege level 15
 logging synchronous
line aux 0
line vty 0 4
```

```
exec-timeout 30 0
privilege level 15
logging synchronous
no login
transport input telnet
line vty 5 15
privilege level 15
no login
transport input telnet
!
ntp clock-period 17179929
ntp server 10.12.7.79
ntp server 10.12.3.138
!
end
```

Site6 Cisco 3640A (VXML) Gateway

```
Building configuration...

Current configuration : 6794 bytes
!
! Last configuration change at 16:34:02 EST Fri Aug 13 2004
! NVRAM config last updated at 16:34:03 EST Fri Aug 13 2004
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname NS6-3640-GW1
!
boot-start-marker
boot system flash:c3640-is-mz.123-7.T1.bin
boot-end-marker
!
logging buffered 1000000 debugging
no logging console
!
clock timezone EDT -5
clock summer-time EST recurring
voice-card 0
!
voice-card 1
!
voice-card 2
!
no aaa new-model
ip subnet-zero
!
!
ip cef
ip ftp username Administrator
ip ftp password gbipcc
ip domain name ipcc.com
ip host gbipcc 172.18.141.128
ip host isn-vxml 10.12.7.80
ip host media 10.12.7.44
ip host media-backup 10.12.7.44
ip name-server 10.12.3.72
ip name-server 10.12.7.47
!
!
```



```
framing esf
linecode b8zs
pri-group timeslots 1-24
!
controller T1 2/1
framing sf
linecode ami
!
!
!
interface Serial0/0:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn protocol-emulate network
isdn incoming-voice voice
isdn bchan-number-order descending
no cdp enable
!
interface Serial0/1:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
no cdp enable
!
interface Serial1/0:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
no cdp enable
!
interface Serial1/1:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
no cdp enable
!
interface Serial2/0:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
no cdp enable
!
interface FastEthernet3/0
```

```
description Connect to NS6-3524 0/4
ip address 10.12.9.2 255.255.255.248
speed 100
full-duplex
h323-gateway voip interface
h323-gateway voip id ns4-isn-zone ipaddr 10.12.7.69 1719
h323-gateway voip h323-id NS6-3640-GW1
h323-gateway voip tech-prefix 1#
!
interface FastEthernet3/1
no ip address
shutdown
duplex auto
speed auto
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 10.12.9.1
!
!
!
snmp-server community gbipcc RW
snmp-server enable traps snmp authentication linkdown linkup coldstart
warmstart
snmp-server enable traps tty
snmp-server enable traps casa
snmp-server enable traps xgcp
snmp-server enable traps cnpd
snmp-server enable traps isdn call-information
snmp-server enable traps isdn layer2
snmp-server enable traps isdn chan-not-avail
snmp-server enable traps isdn ietf
snmp-server enable traps hsrp
snmp-server enable traps config
snmp-server enable traps entity
snmp-server enable traps cpu threshold
snmp-server enable traps flash insertion removal
snmp-server enable traps envmon
snmp-server enable traps ds0-busyout
snmp-server enable traps ds1-loopback
snmp-server enable traps bgp
snmp-server enable traps ospf state-change
snmp-server enable traps ospf errors
snmp-server enable traps ospf retransmit
snmp-server enable traps ospf lsa
snmp-server enable traps ospf cisco-specific state-change
snmp-server enable traps ospf cisco-specific errors
snmp-server enable traps ospf cisco-specific retransmit
```

```

snmp-server enable traps ospf cisco-specific lsa
snmp-server enable traps pim neighbor-change rp-mapping-change
invalid-pim-messa
ge
snmp-server enable traps ipmulticast
snmp-server enable traps msdp
snmp-server enable traps rsvp
snmp-server enable traps frame-relay
snmp-server enable traps frame-relay subif
snmp-server enable traps rtr
snmp-server enable traps syslog
snmp-server enable traps stun
snmp-server enable traps dlsw
snmp-server enable traps bstun
snmp-server enable traps pppoe
snmp-server enable traps l2tun session
snmp-server enable traps atm subif
snmp-server enable traps dial
snmp-server enable traps dsp card-status
snmp-server enable traps ipmobile
snmp-server enable traps vtp
snmp-server enable traps voice poor-qov
snmp-server enable traps dnis
!
!
control-plane
!
call treatment on
call threshold global cpu-avg low 60 high 85
call threshold global total-mem low 60 high 90
call threshold global proc-mem low 60 high 85
!
call application voice handoff flash:handoff.tcl
call application voice handoff language 0 en
call application voice handoff set-location en 0 flash
!
call application voice new-call flash:bootstrap.vxml
call application voice new-call language 0 en
call application voice new-call set-location en 0 flash
!
call application voice vru-leg flash:Bootstrap.tcl
call application voice vru-leg language 0 en
call application voice vru-leg set-location en 0 flash
!
call application voice survivability flash:survivability.tcl
call application voice survivability after-hours-agent0 60100
call application voice survivability language 0 en
call application voice survivability set-location en 0 flash

```



```
!  
!  
voice-port 0/0:23  
!  
voice-port 0/1:23  
!  
voice-port 1/0:23  
!  
voice-port 1/1:23  
!  
voice-port 2/0:23  
!  
!  
!  
!  
dial-peer cor custom  
!  
!  
!  
dial-peer voice 617 voip  
  destination-pattern 69100  
  voice-class codec 1  
  session target ras  
  tech-prefix 2#  
  dtmf-relay rtp-nte h245-signal h245-alphanumeric  
  no vad  
!  
dial-peer voice 44444 voip  
  application vru-leg  
  incoming called-number 4444T  
  dtmf-relay rtp-nte h245-signal h245-alphanumeric  
  codec g711ulaw  
  no vad  
!  
dial-peer voice 1 pots  
  application survivability  
  incoming called-number 5609609100  
  no digit-strip  
  direct-inward-dial  
  port 0/0:23  
!  
dial-peer voice 2 pots  
  application survivability  
  incoming called-number 5609609100  
  no digit-strip  
  direct-inward-dial  
  port 0/1:23  
!
```

```
dial-peer voice 3 pots
  application survivability
  incoming called-number 5609609100
  no digit-strip
  direct-inward-dial
  port 1/0:23
!
dial-peer voice 4 pots
  application survivability
  incoming called-number 5609609100
  no digit-strip
  direct-inward-dial
  port 1/1:23
!
dial-peer voice 5 pots
  application survivability
  incoming called-number 5609609100
  no digit-strip
  direct-inward-dial
  port 2/0:23
!
num-exp 560960.... 69100
gateway
!
!
line con 0
  exec-timeout 0 0
line aux 0
line vty 0 4
  exec-timeout 0 0
  privilege level 15
  password lab
  login
!
ntp clock-period 17179873
ntp server 10.12.7.79
ntp server 10.12.3.138
!
!
end
```

Site7 Cisco 1751 (VXML) Gateway

```
Building configuration...

Current configuration : 5168 bytes
!
! Last configuration change at 15:49:17 EST Tue Aug 3 2004
! NVRAM config last updated at 15:49:17 EST Tue Aug 3 2004
!
version 12.3
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
!
hostname NS7-1751-GW1
!
boot-start-marker
boot system flash:c1700-sv8y7-mz.123-7.T1.bin
boot-end-marker
!
logging buffered 51200 warnings
!
username cisco privilege 15 password 0 cisco
memory-size iomem 20
clock timezone EDT -5
clock summer-time EST recurring
tdm clock T1 0/0 both export line
tdm clock T1 1/0 both import T1 0/0 internal
mmi polling-interval 60
no mmi auto-configure
no mmi pvc
mmi snmp-timeout 180
voice-card 0
!
voice-card 1
!
no aaa new-model
ip subnet-zero
!
!
ip ftp username Administrator
ip ftp password gbipcc
ip domain name ipcc.com
ip host gbipcc 172.18.141.128
ip host isn-vxml 10.12.11.23
ip host isn-vxml-backup 10.12.11.24
ip name-server 10.12.11.22
```



```
h323-gateway voip id ns7-isn-zone ipaddr 10.12.11.51 1719
h323-gateway voip h323-id NS7-1751-GW1
h323-gateway voip tech-prefix 1#
!
interface Serial0/0:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
no cdp enable
!
interface Serial1/0:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
no cdp enable
!
ip classless
ip route 0.0.0.0 0.0.0.0 10.12.11.49
ip http server
ip http authentication local
!
!
!
snmp-server community gbipcc RW
snmp-server enable traps tty
!
!
control-plane
!
!
call application voice survivability flash:survivability.tcl
call application voice survivability after-hours-agent0 40100
call application voice survivability language 0 en
call application voice survivability set-location en 0 flash
!
call application voice vru-leg flash:Bootstrap.tcl
call application voice vru-leg language 0 en
call application voice vru-leg set-location en 0 flash
!
call application voice handoff flash:handoff.tcl
call application voice handoff language 0 en
call application voice handoff set-location en 0 flash
!
call application voice new-call flash:bootstrap.vxml
call application voice new-call language 0 en
call application voice new-call set-location en 0 flash
```

```
!
voice-port 0/0:23
!
voice-port 1/0:23
!
!
!
dial-peer voice 770 voip
destination-pattern 79100
voice-class codec 1
session target ras
tech-prefix 2#
dtmf-relay rtp-nte h245-signal h245-alphanumeric
no vad
!
dial-peer voice 1 pots
application survivability
destination-pattern 1...
no digit-strip
direct-inward-dial
port 0/0:23
!
dial-peer voice 2 pots
application survivability
destination-pattern 2...
no digit-strip
direct-inward-dial
port 1/0:23
!
dial-peer voice 7000 voip
destination-pattern 79100
voice-class codec 1
session target ras
tech-prefix 2#
dtmf-relay rtp-nte h245-signal h245-alphanumeric
no vad
!
dial-peer voice 77777 voip
application vru-leg
incoming called-number 7777T
dtmf-relay rtp-nte h245-signal h245-alphanumeric
codec g711ulaw
no vad
!
num-exp 1230630.... 79100
gateway
!
!
```

```
line con 0
  exec-timeout 30 0
  privilege level 15
  logging synchronous
  login local
line aux 0
line vty 0 4
  exec-timeout 30 0
  privilege level 15
  logging synchronous
  no login
  transport input telnet
line vty 5 15
  privilege level 15
  login local
  transport input telnet
!
exception protocol ftp
exception dump 10.12.13.212
ntp clock-period 17179783
ntp server 10.12.7.79
ntp server 10.12.3.138
!
end
```

Site7 Cisco 1760 (VXML) Gateway

```
Building configuration...

Current configuration : 3918 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname NS7-1760-GW1
!
boot-start-marker
boot system flash:c1700-sv8y7-mz.123-7.T1.bin
boot-end-marker
!
logging buffered 1000000 debugging
!
tdm clock T1 0/0 both export line
tdm clock T1 0/1 both import T1 0/0 line
mmi polling-interval 60
no mmi auto-configure
no mmi pvc
mmi snmp-timeout 180
voice-card 0
!
voice-card 1
!
no aaa new-model
ip subnet-zero
!
!
ip ftp username Administrator
ip ftp password gbipcc
ip domain name ipcc.com
ip host gbipcc 172.18.141.128
ip host isn-vxml 10.12.11.23
ip host isn-vxml-backup 10.12.11.24
ip name-server 10.12.11.22
!
!
ip cef
!
isdn switch-type primary-dms100
!
!
```



```
voice service voip
  fax protocol t38 ls-redundancy 0 hs-redundancy 0 fallback cisco
  h323
  call start slow
  !
  !
voice class codec 1
  codec preference 1 g711ulaw
  codec preference 2 g729r8
  !
  !
  !
voice class h323 1
  h225 timeout tcp establish 3
  !
  !
  !
  !
  !
  !
  !
  !
  !
controller T1 0/0
  framing esf
  linecode b8zs
  pri-group timeslots 1-24
  !
controller T1 0/1
  framing esf
  linecode b8zs
  pri-group timeslots 1-24
  !
controller T1 1/0
  shutdown
  framing esf
  linecode b8zs
  !
  !
  !
interface FastEthernet0/0
  description Connected to NS7-CAT6K 2/24 via K45-J12
  ip address 10.12.11.53 255.255.255.240
  speed 100
  full-duplex
  h323-gateway voip interface
  h323-gateway voip id ns7-isn-zone ipaddr 10.12.11.51 1719
  h323-gateway voip h323-id NS7-1760-GW1
```

```
h323-gateway voip tech-prefix 1#
!
interface Serial0/0:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
no cdp enable
!
interface Serial0/1:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
no cdp enable
!
ip classless
ip route 0.0.0.0 0.0.0.0 10.12.11.49
no ip http server
!
!
!
snmp-server community gbipcc RW
snmp-server enable traps tty
!
!
control-plane
!
!
call application voice handoff flash:handoff.tcl
call application voice handoff language 0 en
call application voice handoff set-location en 0 flash
!
call application voice vru-leg flash:Bootstrap.tcl
call application voice vru-leg language 0 en
call application voice vru-leg set-location en 0 flash
!
call application voice new-call flash:bootstrap.vxml
call application voice new-call language 0 en
call application voice new-call set-location en 0 flash
!
call application voice survivability flash:survivability.tcl
call application voice survivability after-hours-agent0 40100
call application voice survivability language 0 en
call application voice survivability set-location en 0 flash
!
voice-port 0/0:23
!
```

```
voice-port 0/1:23
!
!
dial-peer cor custom
!
!
!
dial-peer voice 770 voip
destination-pattern 79100
voice-class codec 1
session target ras
tech-prefix 2#
dtmf-relay rtp-nte h245-signal h245-alphanumeric
no vad
!
dial-peer voice 1 pots
application survivability
incoming called-number 12306309100
no digit-strip
direct-inward-dial
port 0/0:23
!
dial-peer voice 2 pots
application survivability
incoming called-number 12306309100
no digit-strip
direct-inward-dial
port 0/1:23
!
dial-peer voice 3 pots
incoming called-number 12306309100
no digit-strip
direct-inward-dial
port 0/0:23
!
dial-peer voice 4 pots
incoming called-number 12306309100
no digit-strip
direct-inward-dial
port 0/1:23
!
dial-peer voice 7000 voip
destination-pattern 79100
voice-class codec 1
session target ras
tech-prefix 2#
dtmf-relay rtp-nte h245-signal h245-alphanumeric
no vad
```

```
!  
dial-peer voice 77777 voip  
  application vru-leg  
  incoming called-number 7777T  
  dtmf-relay rtp-nte h245-signal h245-alphanumeric  
  codec g711ulaw  
  no vad  
!  
num-exp 1230630.... 79100  
gateway  
!  
!  
line con 0  
  exec-timeout 0 0  
line aux 0  
line vty 0 4  
  exec-timeout 0 0  
  privilege level 15  
  password lab  
  login  
line vty 5 15  
  privilege level 15  
  no login  
!  
!  
end
```

Site7 Cisco AS5350 (VXML) Gateway

```
Building configuration...

Current configuration : 4781 bytes
!
! No configuration change since last restart
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname NS7-5350-GW1
!
boot-start-marker
boot system flash:c5350-is-mz.123-7.T1.bin
no boot startup-test
boot-end-marker
!
logging buffered 1000000 debugging
!
!
!
resource-pool disable
clock timezone EDT -5
clock summer-time EST recurring
spe default-firmware spe-firmware-1
no aaa new-model
ip subnet-zero
!
!
ip cef
ip ftp username Administrator
ip ftp password gbipcc
ip domain name ipcc.com
ip host gbipcc 172.18.141.128
ip host isn-vxml 10.12.11.23
ip host isn-vxml-backup 10.12.11.24
ip name-server 10.12.11.22
!
!
isdn switch-type primary-dms100
!
!
voice service voip
    fax protocol t38 ls-redundancy 0 hs-redundancy 0 fallback cisco
```



```
framing sf
linecode ami
!
controller T1 2/6
framing sf
linecode ami
!
controller T1 2/7
framing sf
linecode ami
!
!
interface FastEthernet0/0
description Connected to NS7-CAT6K 3/9
ip address 10.12.11.55 255.255.255.240
logging event link-status
duplex full
speed 100
h323-gateway voip interface
h323-gateway voip id ns7-isn-zone ipaddr 10.12.11.51 1719
h323-gateway voip h323-id NS7-5350-GW1
h323-gateway voip tech-prefix 1#
!
interface FastEthernet0/1
no ip address
shutdown
duplex auto
speed auto
!
interface Serial0/0
no ip address
shutdown
clockrate 2000000
!
interface Serial2/0
no ip address
shutdown
!
interface Serial0/1
no ip address
shutdown
clockrate 2000000
!
interface Serial2/0:23
no ip address
isdn switch-type primary-dms100
isdn incoming-voice modem
no cdp enable
```

```

!
interface Serial2/1:23
  no ip address
  isdn switch-type primary-dms100
  isdn incoming-voice modem
  no cdp enable
!
interface Serial2/2:23
  no ip address
  isdn switch-type primary-dms100
  isdn incoming-voice modem
  no cdp enable
!
interface Serial2/3:23
  no ip address
  isdn switch-type primary-dms100
  isdn incoming-voice modem
  no cdp enable
!
interface Group-Async0
  no ip address
  group-range 1/00 1/107
!
ip classless
ip route 0.0.0.0 0.0.0.0 10.12.11.49
no ip http server
!
!
!
snmp-server community gbipcc RW
snmp-server enable traps tty
!
!
!
control-plane
!
!
call application voice handoff flash:handoff.tcl
call application voice handoff language 0 en
call application voice handoff set-location en 0 flash
!
call application voice new-call flash:bootstrap.vxml
call application voice new-call language 0 en
call application voice new-call set-location en 0 flash
!
call application voice vru-leg flash:Bootstrap.tcl
call application voice vru-leg language 0 en
call application voice vru-leg set-location en 0 flash

```



```
!
call application voice survivability flash:survivability.tcl
call application voice survivability after-hours-agent0 70100
call application voice survivability language 0 en
call application voice survivability set-location en 0 flash
!
!
voice-port 2/0:D
!
voice-port 2/1:D
!
voice-port 2/2:D
!
voice-port 2/3:D
!
!
dial-peer cor custom
!
!
!
dial-peer voice 1 pots
  application survivability
  incoming called-number 12306309100
  no digit-strip
  direct-inward-dial
  port 2/0:D
!
dial-peer voice 2 pots
  application survivability
  incoming called-number 12306309100
  no digit-strip
  direct-inward-dial
  port 2/1:D
!
dial-peer voice 3 pots
  application survivability
  incoming called-number 12306309100
  no digit-strip
  direct-inward-dial
  port 2/2:D
!
dial-peer voice 4 pots
  application survivability
  incoming called-number 12306309100
  no digit-strip
  direct-inward-dial
  port 2/3:D
!
```

```
dial-peer voice 77777 voip
  application vru-leg
  incoming called-number 7777T
  dtmf-relay rtp-nte h245-signal h245-alphanumeric
  codec g711ulaw
  no vad
!
dial-peer voice 7000 voip
  destination-pattern 79100
  voice-class codec 1
  session target ras
  tech-prefix 2#
  dtmf-relay rtp-nte h245-signal h245-alphanumeric
  no vad
!
!
num-exp 1230630.... 79100
gateway
!
ss7 mtp2-variant Bellcore 0
ss7 mtp2-variant Bellcore 1
ss7 mtp2-variant Bellcore 2
ss7 mtp2-variant Bellcore 3
!
line con 0
line aux 0
line vty 0 4
  privilege level 15
  password lab
  login
line 1/00 1/107
  no flush-at-activation
  modem InOut
!
scheduler allocate 10000 400
ntp clock-period 17180084
ntp server 10.12.3.138
!
end
```

Site7 Cisco AS5400 (VXML) Gateway

```
Building configuration...

Current configuration : 5532 bytes
!
! Last configuration change at 16:31:53 EST Fri Aug 13 2004
! NVRAM config last updated at 16:31:53 EST Fri Aug 13 2004
!
version 12.3
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
!
hostname NS7-5400-GW1
!
boot-start-marker
boot system flash:c5400-is-mz.123-7.T1.bin
no boot startup-test
boot-end-marker
!
no logging console
!
!
!
resource-pool disable
clock timezone EDT -5
clock summer-time EST recurring
spe default-firmware spe-firmware-1
no aaa new-model
ip subnet-zero
!
!
ip cef
ip ftp username Administrator
ip ftp password gbipcc
ip domain name ipcc.com
ip host gbipcc 172.18.141.128
ip host isn-vxml 10.12.11.23
ip host isn-vxml-backup 10.12.11.24
ip name-server 10.12.11.22
!
!
isdn switch-type primary-dms100
!
!
voice service voip
```



```
!  
controller T1 6/6  
  framing sf  
  linecode ami  
!  
controller T1 6/7  
  framing sf  
  linecode ami  
!  
controller T1 7/0  
  framing esf  
  linecode b8zs  
  pri-group timeslots 1-24  
!  
controller T1 7/1  
  framing esf  
  linecode b8zs  
  pri-group timeslots 1-24  
!  
controller T1 7/2  
  framing esf  
  linecode b8zs  
  pri-group timeslots 1-24  
!  
controller T1 7/3  
  framing esf  
  linecode b8zs  
  pri-group timeslots 1-24  
!  
controller T1 7/4  
  framing sf  
  linecode ami  
!  
controller T1 7/5  
  framing sf  
  linecode ami  
!  
controller T1 7/6  
  framing sf  
  linecode ami  
!  
controller T1 7/7  
  framing sf  
  linecode ami  
!  
!  
interface FastEthernet0/0  
  ip address 10.12.11.54 255.255.255.240
```

```
logging event link-status
duplex full
speed 100
h323-gateway voip interface
h323-gateway voip id ns7-isn-zone ipaddr 10.12.11.51 1719
h323-gateway voip h323-id NS7-5400-GW1
h323-gateway voip tech-prefix 1#
!
interface FastEthernet0/1
no ip address
shutdown
duplex auto
speed auto
!
interface Serial0/0
no ip address
shutdown
clockrate 2000000
!
interface Serial6/0
no ip address
shutdown
!
interface Serial7/0
no ip address
shutdown
!
interface Serial0/1
no ip address
shutdown
clockrate 2000000
!
interface Serial7/0:23
no ip address
isdn switch-type primary-dms100
isdn incoming-voice modem
no cdp enable
!
interface Serial7/1:23
no ip address
isdn switch-type primary-dms100
isdn incoming-voice modem
no cdp enable
!
interface Serial7/2:23
no ip address
isdn switch-type primary-dms100
isdn incoming-voice modem
```

```
no cdp enable
!
interface Serial7/3:23
no ip address
isdn switch-type primary-dms100
isdn incoming-voice modem
no cdp enable
!
interface Group-Async0
no ip address
group-range 1/00 5/107
!
ip classless
ip route 0.0.0.0 0.0.0.0 10.12.11.49
no ip http server
!
!
!
snmp-server community gbipcc RW
snmp-server enable traps tty
!
!
!
control-plane
!
!
call application voice survivability flash:survivability.tcl
call application voice survivability after-hours-agent0 40100
call application voice survivability language 0 en
call application voice survivability set-location en 0 flash
!
call application voice handoff flash:handoff.tcl
call application voice handoff language 0 en
call application voice handoff set-location en 0 flash
!
call application voice new-call flash:bootstrap.vxml
call application voice new-call language 0 en
call application voice new-call set-location en 0 flash
!
call application voice vru-leg flash:Bootstrap.tcl
call application voice vru-leg language 0 en
call application voice vru-leg set-location en 0 flash
!
!
voice-port 7/0:D
!
voice-port 7/1:D
!
```

```
voice-port 7/2:D
!
voice-port 7/3:D
!
!
dial-peer cor custom
!
!
!
dial-peer voice 2 pots
  destination-pattern 2...
  no digit-strip
  direct-inward-dial
  port 7/1:D
!
dial-peer voice 770 voip
  destination-pattern 79100
  voice-class codec 1
  session target ras
  tech-prefix 2#
  dtmf-relay rtp-nte h245-signal h245-alphanumeric
  no vad
!
dial-peer voice 1 pots
  destination-pattern 1...
  no digit-strip
  direct-inward-dial
  port 7/0:D
!
dial-peer voice 3 pots
  destination-pattern 3...
  no digit-strip
  direct-inward-dial
  port 7/2:D
!
dial-peer voice 4 pots
  destination-pattern 4...
  no digit-strip
  direct-inward-dial
  port 7/3:D
!
dial-peer voice 7000 voip
  destination-pattern 7...
  voice-class codec 1
  session target ras
  tech-prefix 2#
  dtmf-relay rtp-nte h245-signal h245-alphanumeric
  no vad
```



```
!  
dial-peer voice 77777 voip  
  application vru-leg  
  incoming called-number 7777T  
  dtmf-relay rtp-nte h245-signal h245-alphanumeric  
  codec g711ulaw  
  no vad  
!  
!  
num-exp 1230630.... 79100  
gateway  
!  
ss7 mtp2-variant Bellcore 0  
ss7 mtp2-variant Bellcore 1  
ss7 mtp2-variant Bellcore 2  
ss7 mtp2-variant Bellcore 3  
!  
line con 0  
  exec-timeout 0 0  
  privilege level 15  
  logging synchronous  
line aux 0  
line vty 0 4  
  exec-timeout 0 0  
  privilege level 15  
  password lab  
  logging synchronous  
  login  
line 1/00 2/59  
  no flush-at-activation  
  modem InOut  
line 3/00 3/107  
  no flush-at-activation  
  modem InOut  
line 5/00 5/107  
  no flush-at-activation  
  modem InOut  
!  
exception protocol ftp  
scheduler allocate 10000 400  
ntp clock-period 17179952  
ntp server 10.12.7.79  
ntp server 10.12.3.138  
!  
end
```

Site4 Cisco 3660 Gatekeeper 1

```
Device Configuration Viewer
ns4-gk1

Global
! No configuration change since last restart
version 12.3
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
hostname NS4-3660-GK1
boot-start-marker
boot system flash:c3660-ix-mz.123-7.T1.bin
boot-end-marker
clock timezone EDT -5
clock summer-time EST recurring
no aaa new-model
voice call carrier capacity active
ntp clock-period 17180087
ntp server 10.12.7.79
ntp server 10.12.3.138

IP

IP-IP Global
ip subnet-zero
ip cef
ip tftp source-interface FastEthernet0/0
ip ftp source-interface FastEthernet0/0
ip ftp username Administrator
ip ftp password gbipcc
ip domain name ipcc.com
ip host gbipcc 172.18.141.128
ip name-server 10.12.3.72
ip name-server 10.12.7.47
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 10.12.7.65

Interface

Interface-Interface FastEthernet0/0
interface FastEthernet0/0
ip address 10.12.7.83 255.255.255.224
speed 100
full-duplex
```

```
standby 1 ip 10.12.7.69
standby 1 priority 110
standby 1 preempt

Interface-Interface FastEthernet0/1
interface FastEthernet0/1
no ip address
shutdown
duplex auto
speed auto

SNMP
snmp-server community ***** RW
snmp-server enable traps snmp authentication linkdown linkup
coldstart warmstart
snmp-server enable traps tty
snmp-server enable traps gatekeeper
snmp-server enable traps cnpd
snmp-server enable traps isdn call-information
snmp-server enable traps isdn layer2
snmp-server enable traps isdn chan-not-avail
snmp-server enable traps isdn ietf
snmp-server enable traps hsrp
snmp-server enable traps config
snmp-server enable traps entity
snmp-server enable traps cpu threshold
snmp-server enable traps flash insertion removal
snmp-server enable traps envmon
snmp-server enable traps ds0-busyout
snmp-server enable traps dsl-loopback
snmp-server enable traps bgp
snmp-server enable traps ospf state-change
snmp-server enable traps ospf errors
snmp-server enable traps ospf retransmit
snmp-server enable traps ospf lsa
snmp-server enable traps ospf cisco-specific state-change
snmp-server enable traps ospf cisco-specific errors
snmp-server enable traps ospf cisco-specific retransmit
snmp-server enable traps ospf cisco-specific lsa
snmp-server enable traps pim neighbor-change rp-mapping-change
invalid-pim-message
snmp-server enable traps ipmulticast
snmp-server enable traps msdp
snmp-server enable traps rsvp
snmp-server enable traps frame-relay
snmp-server enable traps frame-relay subif
snmp-server enable traps rtr
snmp-server enable traps syslog
```

```

snmp-server enable traps dial
snmp-server enable traps voice poor-qov
snmp-server enable traps dnis

Control plane
  control-plane

Dial-peer

Dial-peer-Dial-peer cor custom
  dial-peer cor custom

Gatekeeper
  gatekeeper
  zone local ns4-isn-zone ipcc.com 10.12.7.69
  zone remote ns4cm-zone ipcc.com 10.12.3.132 1719
  zone remote ns7cm-zone ipcc.com 10.12.3.132 1719
  zone remote ns4cm-zone-bk ipcc.com 10.12.3.163 1719
  zone remote ns7cm-zone-bk ipcc.com 10.12.3.163 1719
  zone prefix ns4-isn-zone 4444* gw-priority 10 NS4-5400-GW5
NS4-5400-GW4 NS4-5400-GW3 NS4-5400-GW2 NS4-5400-GW1 NS5-1760-GW2
NS6-3640-GW1 NS5-1760-GW1 NS5-3745-GW1
  zone prefix ns4-isn-zone 49100*
  zone prefix ns4cm-zone 4....
  zone prefix ns4cm-zone-bk 4....
  zone prefix ns4-isn-zone 59100*
  zone prefix ns4cm-zone 5....
  zone prefix ns4-isn-zone 69100*
  zone prefix ns4cm-zone 6....
  zone prefix ns7cm-zone 7....
  zone prefix ns7cm-zone-bk 7....
  gw-type-prefix 1#* default-technology
  gw-type-prefix 2#*
  arq reject-unknown-prefix
  lrq forward-queries
  lrq lrj immediate-advance
  timer cluster-element announce 25
  load-balance cpu 80 memory 80
  no shutdown
  endpoint alt-ep h323id NS5-3745-GW1 10.12.7.74
  endpoint alt-ep h323id NS6-3640-GW1 10.12.7.74
  endpoint alt-ep h323id NS5-1760-GW1 10.12.7.74
  endpoint alt-ep h323id NS5-1760-GW2 10.12.7.74

Line

Line-Line con 0
  line con 0

```

```
exec-timeout 0 0
privilege level 15
transport preferred all
transport output all

Line-Line aux 0
line aux 0
transport preferred all
transport output all

Line-Line vty 0 4
line vty 0 4
exec-timeout 0 0
privilege level 15
no login
transport preferred all
transport input all
transport output all
```

Site4 Cisco 3660 Gatekeeper 2

```
Device Configuration Viewer
ns4-gk2

Global
! Last configuration change at 10:08:58 EST Thu Jul 29 2004
! NVRAM config last updated at 10:08:58 EST Thu Jul 29 2004
version 12.3
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
hostname NS4-3660-GK2
boot-start-marker
boot system flash:c3660-ix-mz.123-7.T1.bin
boot-end-marker
logging buffered 10000000 debugging
no logging console
clock timezone EDT -5
clock summer-time EST recurring
no aaa new-model
voice call carrier capacity active
ntp clock-period 17180143
ntp server 10.12.7.79
ntp server 10.12.3.138

IP

IP-IP Global
ip subnet-zero
ip cef
ip ftp username Administrator
ip ftp password gbipcc
ip domain name ipcc.com
ip host gbipcc 172.18.141.128
ip name-server 10.12.3.72
ip name-server 10.12.7.47
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 10.12.7.65

Controller

Controller-Controller T1 1/0
controller T1 1/0
framing sf
linecode ami
```

```
Controller-Controller T1 1/1
  controller T1 1/1
  framing sf
  linecode ami

Interface

Interface-Interface FastEthernet0/0
  interface FastEthernet0/0
  description Connected to NS4-CAT6K 3/38
  ip address 10.12.7.84 255.255.255.224
  speed 100
  full-duplex
  standby 1 ip 10.12.7.69
  standby 1 priority 110
  standby 1 preempt

Interface-Interface FastEthernet0/1
  interface FastEthernet0/1
  no ip address
  shutdown
  duplex auto
  speed auto

SNMP
  snmp-server community ***** RW
  snmp-server enable traps snmp authentication linkdown linkup
coldstart warmstart
  snmp-server enable traps tty
  snmp-server enable traps gatekeeper
  snmp-server enable traps cnpd
  snmp-server enable traps isdn call-information
  snmp-server enable traps isdn layer2
  snmp-server enable traps isdn chan-not-avail
  snmp-server enable traps isdn ietf
  snmp-server enable traps hsrp
  snmp-server enable traps config
  snmp-server enable traps entity
  snmp-server enable traps cpu threshold
  snmp-server enable traps flash insertion removal
  snmp-server enable traps envmon
  snmp-server enable traps ds0-busyout
  snmp-server enable traps dsl-loopback
  snmp-server enable traps bgp
  snmp-server enable traps ospf state-change
  snmp-server enable traps ospf errors
  snmp-server enable traps ospf retransmit
```

```

snmp-server enable traps ospf lsa
snmp-server enable traps ospf cisco-specific state-change
snmp-server enable traps ospf cisco-specific errors
snmp-server enable traps ospf cisco-specific retransmit
snmp-server enable traps ospf cisco-specific lsa
snmp-server enable traps pim neighbor-change rp-mapping-change
invalid-pim-message
snmp-server enable traps ipmulticast
snmp-server enable traps msdp
snmp-server enable traps rsvp
snmp-server enable traps frame-relay
snmp-server enable traps frame-relay subif
snmp-server enable traps rtr
snmp-server enable traps syslog
snmp-server enable traps dial
snmp-server enable traps voice poor-qov
snmp-server enable traps dnis

Control plane
control-plane

Dial-peer

Dial-peer-Dial-peer cor custom
dial-peer cor custom

Gatekeeper
gatekeeper
zone local ns4-isn-zone ipcc.com 10.12.7.69
zone local ns7-isn-zone ipcc.com
zone remote ns4cm-zone ipcc.com 10.12.3.132 1719
zone remote ns7cm-zone ipcc.com 10.12.3.132 1719
zone remote ns4cm-zone-bk ipcc.com 10.12.3.163 1719
zone remote ns7cm-zone-bk ipcc.com 10.12.3.163 1719
zone prefix ns4-isn-zone 4444* gw-priority 10 NS5-1760-GW2
NS5-1760-GW1 NS5-3745-GW1 NS6-1751-GW2 NS6-1751-GW1 NS6-3640-GW1
NS4-5400-GW5 NS4-5400-GW4 NS4-5400-GW3 NS4-5400-GW2 NS4-5400-GW1
zone prefix ns4-isn-zone 49100* gw-priority 10 NS4-ISN1 NS4-ISN2
NS4-ISN3
zone prefix ns4cm-zone 4....
zone prefix ns4cm-zone-bk 4....
zone prefix ns4-isn-zone 59100* gw-priority 10 NS4-ISN3 NS4-ISN2
NS4-ISN1
zone prefix ns4cm-zone 5....
zone prefix ns4-isn-zone 69100* gw-priority 10 NS4-ISN1 NS4-ISN2
NS4-ISN3
zone prefix ns4cm-zone 6....
zone prefix ns7cm-zone 7....

```



```
zone prefix ns7cm-zone-bk 7...
gw-type-prefix 1#* default-technology
gw-type-prefix 2#*
arq reject-unknown-prefix
lrq forward-queries
lrq lrj immediate-advance
timer cluster-element announce 25
load-balance cpu 80 memory 80
no shutdown
endpoint alt-ep h323id NS5-3745-GW1 10.12.7.74
endpoint alt-ep h323id NS6-3640-GW1 10.12.7.74
endpoint alt-ep h323id NS5-1760-GW1 10.12.7.74
endpoint alt-ep h323id NS5-1760-GW2 10.12.7.74
endpoint alt-ep h323id NS4-ISN1 10.12.7.42
endpoint alt-ep h323id NS4-ISN2 10.12.7.43
endpoint alt-ep h323id NS4-ISN3 10.12.7.41
```

Line

```
Line-Line con 0
  line con 0
  exec-timeout 0 0
  transport preferred all
  transport output all

Line-Line aux 0
  line aux 0
  transport preferred all
  transport output all

Line-Line vty 0 4
  line vty 0 4
  exec-timeout 0 0
  privilege level 15
  no login
  transport preferred all
  transport input all
  transport output all

Line-Line vty 5 15
  line vty 5 15
  privilege level 15
  no login
  transport preferred all
  transport input all
  transport output all
```

Site4 Cisco 11501 Content Switch

```

!Generated on 08/18/2004 18:07:37
!Active version: sg0710405

configure

!***** GLOBAL *****
  sntp server 10.12.7.79 version 1
  cdp run

  ip route 0.0.0.0 0.0.0.0 10.12.7.65 1

!***** CIRCUIT *****
circuit VLAN1

  ip address 10.12.7.68 255.255.255.224

!***** SERVICE *****
service NS4-ISN1
  keepalive retryperiod 2
  keepalive maxfailure 1
  ip address 10.12.7.41
  keepalive type script ap-kal-httpvxml "10.12.7.41"
  active

service NS4-ISN2
  ip address 10.12.7.42
  keepalive type script ap-kal-httpvxml "10.12.7.42"
  keepalive retryperiod 2
  keepalive maxfailure 1
  active

service NS4-ISN3
  keepalive retryperiod 2
  keepalive maxfailure 1
  ip address 10.12.7.43
  keepalive type script ap-kal-httpvxml "10.12.7.43"
  active

service NS4-MS
  ip address 10.12.7.44
  type redirect
  port 80
  keepalive type http
  keepalive retryperiod 2

```

```
keepalive maxfailure 1
domain 10.12.7.44
keepalive uri "/postinfo.html"
active

service NS5-ASRTTS1
protocol tcp
keepalive retryperiod 2
keepalive maxfailure 1
keepalive type tcp
keepalive port 554
ip address 10.12.8.19
port 554
active

!***** OWNER *****
owner GB

content APPSERVERS
protocol tcp
port 8000
add service NS4-ISN1
add service NS4-ISN2
add service NS4-ISN3
vip address 10.12.7.80
active

content ASRTTS
add service NS5-ASRTTS1
primarySorryServer NS5-ASRTTS1
protocol tcp
port 554
vip address 10.12.7.82
active

content MEDIA
protocol tcp
port 80
url "/"@"
add service NS4-MS
primarySorryServer NS4-MS
vip address 10.12.7.81
active

!***** GROUP *****
group appservers
add destination service NS4-ISN1
add destination service NS4-ISN2
```

```
add destination service NS4-MSN3
vip address 10.12.7.80
active

group asrttsservers
add destination service NS5-ASRTTS1
vip address 10.12.7.82
active

group mediaservers
add destination service NS4-MS
vip address 10.12.7.81
active
```

Outbound Option Call Flow Components

Listed in this section are configuration commands for components such as the CMM gateway that are involved in handling the Outbound Option Call Flow at Site3.

- [Site3 Cisco Catalyst Series 6500 \(CMM\) Gateway, page C-99](#)

Site3 Cisco Catalyst Series 6500 (CMM) Gateway

Building configuration...

```
Current configuration : 7906 bytes
!
! Last configuration change at 09:33:22 EST Wed Aug 18 2004
! NVRAM config last updated at 09:33:37 EST Wed Aug 18 2004
!
version 12.3
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
!
hostname ns3-cmm-gw1
!
boot-start-marker
boot system bootflash:wscmm-i6s-mz.ipcbu_cmm.Jun3w
boot-end-marker
!
logging buffered 10000000 debugging
no logging console
!
clock timezone EDT -5
clock summer-time EST recurring
no aaa new-model
ip subnet-zero
ip tcp synwait-time 13
ip ftp username Administrator
ip ftp password gbipcc
ip domain name ipcc.com
ip host gbipcc 172.18.141.128
ip name-server 10.12.3.72
ip name-server 10.12.7.47
!
!
```

```
isdn switch-type primary-dms100
!
!
!
!
!
!
!
!
!
!
ccm-manager redundant-host NS3-CM2
ccm-manager mgcp
no ccm-manager fax protocol cisco
ccm-manager music-on-hold
ccm-manager config server 10.12.6.2
ccm-manager config
!
!
!
controller T1 1/0
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
!
controller T1 1/1
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
!
controller T1 1/2
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
!
controller T1 1/3
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
!
controller T1 1/4
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
!
controller T1 1/5
    framing esf
    linecode b8zs
```

```
    pri-group timeslots 1-24 service mgcp
!
controller T1 2/0
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
!
controller T1 2/1
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
!
controller T1 2/2
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
!
controller T1 2/3
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
!
controller T1 2/4
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
!
controller T1 2/5
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
!
controller T1 3/0
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
!
controller T1 3/1
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
!
controller T1 3/2
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 service mgcp
!
controller T1 3/3
```

```
framing esf
linecode b8zs
pri-group timeslots 1-24 service mgcp
!
controller T1 3/4
framing sf
linecode ami
!
controller T1 3/5
framing esf
linecode b8zs
pri-group timeslots 1-24 service mgcp
!
interface GigabitEthernet1/0
ip address 10.12.6.66 255.255.255.240
no ip proxy-arp
no negotiation auto
no keepalive
!
interface Serial1/0:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
isdn bind-l3 ccm-manager
no cdp enable
!
interface Serial1/1:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
isdn bind-l3 ccm-manager
no cdp enable
!
interface Serial1/2:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
isdn bind-l3 ccm-manager
no cdp enable
!
interface Serial1/3:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn incoming-voice voice
```



```
    isdn bind-l3 ccm-manager
    no cdp enable
!
interface Serial1/4:23
    no ip address
    no logging event link-status
    isdn switch-type primary-dms100
    isdn incoming-voice voice
    isdn bind-l3 ccm-manager
    no cdp enable
!
interface Serial1/5:23
    no ip address
    no logging event link-status
    isdn switch-type primary-dms100
    isdn incoming-voice voice
    isdn bind-l3 ccm-manager
    no cdp enable
!
interface Serial2/0:23
    no ip address
    no logging event link-status
    isdn switch-type primary-dms100
    isdn incoming-voice voice
    isdn bind-l3 ccm-manager
    no cdp enable
!
interface Serial2/1:23
    no ip address
    no logging event link-status
    isdn switch-type primary-dms100
    isdn incoming-voice voice
    isdn bind-l3 ccm-manager
    no cdp enable
!
interface Serial2/2:23
    no ip address
    no logging event link-status
    isdn switch-type primary-dms100
    isdn incoming-voice voice
    isdn bind-l3 ccm-manager
    no cdp enable
!
interface Serial2/3:23
    no ip address
    no logging event link-status
    isdn switch-type primary-dms100
    isdn incoming-voice voice
```

```
    isdn bind-l3 ccm-manager
    no cdp enable
!
interface Serial2/4:23
    no ip address
    no logging event link-status
    isdn switch-type primary-dms100
    isdn incoming-voice voice
    isdn bind-l3 ccm-manager
    no cdp enable
!
interface Serial2/5:23
    no ip address
    no logging event link-status
    isdn switch-type primary-dms100
    isdn incoming-voice voice
    isdn bind-l3 ccm-manager
    no cdp enable
!
interface Serial3/0:23
    no ip address
    no logging event link-status
    isdn switch-type primary-dms100
    isdn incoming-voice voice
    isdn bind-l3 ccm-manager
    no cdp enable
!
interface Serial3/1:23
    no ip address
    no logging event link-status
    isdn switch-type primary-dms100
    isdn incoming-voice voice
    isdn bind-l3 ccm-manager
    no cdp enable
!
interface Serial3/2:23
    no ip address
    no logging event link-status
    isdn switch-type primary-dms100
    isdn incoming-voice voice
    isdn bind-l3 ccm-manager
    no cdp enable
!
interface Serial3/3:23
    no ip address
    no logging event link-status
    isdn switch-type primary-dms100
    isdn incoming-voice voice
```

```
    isdn bind-l3 ccm-manager
    no cdp enable
    !
interface Serial3/5:23
    no ip address
    no logging event link-status
    isdn switch-type primary-dms100
    isdn incoming-voice voice
    isdn bind-l3 ccm-manager
    no cdp enable
    !
ip classless
ip route 0.0.0.0 0.0.0.0 10.12.6.65
no ip http server
!
snmp-server community gbipcc RW
snmp-server enable traps snmp authentication linkdown linkup coldstart
warmstart
snmp-server enable traps tty
snmp-server enable traps xgcp
snmp-server enable traps dial
snmp-server enable traps isdn call-information
snmp-server enable traps isdn layer2
snmp-server enable traps isdn chan-not-avail
snmp-server enable traps isdn ietf
snmp-server enable traps hsrp
snmp-server enable traps config
snmp-server enable traps entity
snmp-server enable traps cpu threshold
snmp-server enable traps ipmulticast
snmp-server enable traps syslog
snmp-server enable traps dsp card-status
snmp-server enable traps envmon
snmp-server enable traps ds0-busyout
snmp-server enable traps ds1-loopback
snmp-server enable traps voice poor-qov
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!
control-plane
!
!
voice-port 1/0:23
    echo-cancel coverage 64
!
voice-port 1/1:23
    echo-cancel coverage 64
!
voice-port 1/2:23
```

```
    echo-cancel coverage 64
!
voice-port 1/3:23
    echo-cancel coverage 64
!
voice-port 1/4:23
    echo-cancel coverage 64
!
voice-port 1/5:23
    echo-cancel coverage 64
!
voice-port 2/0:23
    echo-cancel coverage 64
!
voice-port 2/1:23
    echo-cancel coverage 64
!
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!
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    echo-cancel coverage 64
!
mgcp
mgcp call-agent NS3-CM1 2427 service-type mgcp version 0.1
mgcp dtmf-relay voip codec all mode out-of-band
mgcp rtp unreachable timeout 1000 action notify
```

```
mgcp modem passthrough voip mode nse
mgcp package-capability rtp-package
no mgcp package-capability res-package
mgcp package-capability sst-package
mgcp package-capability pre-package
no mgcp timer receive-rtcp
mgcp sdp simple
mgcp fax t38 inhibit
mgcp rtp payload-type g726r16 static
!
mgcp profile default
!
!
!
!
!
line con 0
  privilege level 15
  transport preferred all
  transport output all
line vty 0 4
  exec-timeout 0 0
  privilege level 15
  no login
  transport preferred all
  transport input all
  transport output all
!
ntp clock-period 17179925
ntp server 10.12.7.79
ntp server 10.12.3.138
!
end
```

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