UCSE

Cisco Unified Communications System Engineer

Version 1.1

Student Guide

Text Part Number: 67-1574-01

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Course Introduction

Overview

The aim of this course is to produce competent system engineers for the Cisco Unity and Personal Assistant products. It is the second class in a two-class series; the first being Cisco Unified Communications System Administration. This class will prepare engineers to install, upgrade, configure, maintain and troubleshoot new and existing Cisco Unity and/or Personal Assistant systems. The class partially prepares a student to take the Unity System Engineer exam (E90-805).

Outline

The Course Introduction includes these topics:

- Course Objectives

- Learner Skills and Requirements

- Learner Responsibilities

- General Administration

- Course Roadmap

- Learner Introductions

Course Objectives

This section lists the course objectives.

Course Objectives

Upon completion of this course, you will be able to perform the following tasks:

- Identify if a computer system meets the minimum hardware requirements for a Cisco Unity system or explain why it does not.
- Identify if a computer system meets the minimum hardware requirements for a Personal Assistant system or explain why it does not.
- Determine if a voice board that has a particular hardware set up is correct for a Cisco Unity system or explain how to correct it.
- Determine if a voice board that has a particular hardware set up is correct for a Unity Bridge system or explain how to correct it.
- Determine whether a set of installed software components is a minimally adequate set to run Cisco Unity or explain why it is not.
- Determine whether a set of installed software components is a minimally adequate set to run Unity Bridge or explain why it is not.

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Upon completing this course, you will be able to:

■ The first four objectives are all covered in the two lessons in the module on Unified Communications System Hardware.

■ The last two objectives are covered in the module on Unified Communications System Software.

Course Objectives

Upon completion of this course, you will be able to perform the following tasks:

- Determine whether a set of installed software components is a minimally adequate set to run Personal Assistant or explain why it is not.
- List the recommended sequence for installing the Cisco Unity software components.
- Choose those Cisco Unity software components that are used to implement digital networking.
- Determine whether a list of installation tasks for an approved Cisco Unity configuration will result in a working installation or identify why it will not.
- Determine whether a list of installation tasks for an approved Unity Bridge configuration will result in a working installation or identify why it will not.
- Determine whether a list of installation tasks for an approved Personal Assistant configuration will result in a working installation or identify why it will not.

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■ The first two objectives are covered in the module on Unified Communications Systems Software.

■ The third objective is covered in the Unified Communications Networking module.

■ The last three objectives are addressed in the Unified Communications Systems Software module.

Course Objectives

Upon completion of this course, you will be able to perform the following tasks:

- **Order a list of tasks needed to correctly perform an upgrade to Cisco Unity 4.**
- **Order a list of tasks needed to correctly perform an upgrade to Unity Bridge 2.1.**
- **Order a list of tasks to correctly perform an upgrade to the current version of Personal Assistant.**
- **Choose which of the possible types of integration are correct for a given telephone switch.**
- **Determine whether a listed procedure to establish integration between Personal Assistant and Cisco Call Manager will correctly install and configure the integration or explain why it does not.**

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■ The first three objectives are addressed in the Unified Communications System Software module.

■ The last two objectives are covered in the Unified Communications Integrations module.

Course Objectives

Upon completion of this course, you will be able to perform the following tasks:

- **Determine whether a list of steps taken to establish dual-switch integration with a Cisco Unity system will result in a working installation or explain how to make it work.**
- **Order a list of tasks for establishing dual-switch integration with a Cisco Unity system in a sequence to correctly establish both integrations.**
- **Choose the correct description of how SMTP is used to deliver Internet mail from several descriptions.**
- **Describe how to create and use Internet Subscribers and Location Objects.**
- **Describe how to create and use Bridge Subscribers.**

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■ The first two objectives are covered in the Unified Communications Integration module.

■ The next three objectives are addressed in the Unified Communications Networking module.

Course Objectives

Upon completion of this course, you will be able to perform the following tasks:

- **Choose which scenarios would appropriately use blind addressing in Cisco Unity from a list of possible scenarios.**
- **Choose which search options are appropriate in the Cisco Unity System Administrator given a particular addressing and server configuration scenario.**
- **Choose when a customer would appropriately use the Unity Bridge.**
- **Choose when a customer would appropriately use the AMIS protocol.**
- **Choose the definition that describes Cisco Unity digital networking correctly.**
- **Put a randomly ordered series of instructions that describe installation of the Microsoft SMTP Connector and the Cisco Unity Internet Voice Connector (IVC) into an order that will ensure proper installation and operation of the IVC.**
- **Configure the primary location object correctly.**

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■ Information relating to all of these objectives can be found in the Unified Communications Networking module.

Course Objectives

Upon completion of this course, you will be able to perform the following tasks:

- Determine whether it is appropriate to use a dialing domain in a stated customer configuration or explain why it is not.
- Choose the correct Cisco Unity utility to accomplish a particular task.
- Rank order a list of the possible reasons that Cisco Unity is not lighting message-waiting indicators.
- Identify when to use the Event Monitor to diagnose startup problems.
- Describe how diagnostic traces, Unity reports and logs are used to develop historical information about how Unity is doing its job.
- Identify which Cisco Unity report to use to develop further information on a specific Cisco Unity problem .
- Identify which Unity Bridge report to use to develop further information on a specific Unity Bridge problem.

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■ The first objective is covered by the Unified Communications Networking module.

■ The remaining six objectives are addressed by the Unified Communications Maintenance and Utilities module.

Course Objectives

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Upon completion of this course, you will be able to perform the following tasks:

- Make a correct recommendation for the number of ports to use for message waiting indicators.
- Identify when to use the correct Subscriber report to check message activity, distributions lists, storage usage and message traffic.
- Identify when to use the correct system report to monitor system performance through administrative access, system events, port usage and system configuration.
- Correctly match items on a list of Cisco Unity components to the unlabeled but numbered spaces on a drawing of the Cisco Unity architecture.
- Select the correct port settings to be used in the Cisco Unity system.
- Make a recommendation on how to configure Unity Bridge to achieve simultaneous connections for the transfer of messages between the Bridge and Octel nodes.

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■ All of the objectives listed are addressed in the Unified Communications Maintenance and Utilities module.

Learner Skills and Knowledge

This section lists the course prerequisites.

Prerequisite Learner Skills and Knowledge

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MCSE-level knowledge Windows 2000

MCSE-level knowledge Exchange 5.5 or 2000

or

CLP Administrator knowledge Lotus Domino/Notes

Know at least 1 manufacturer's PBX

Cisco Unified Communications System Administration

Cisco Unified Communications System Engineer

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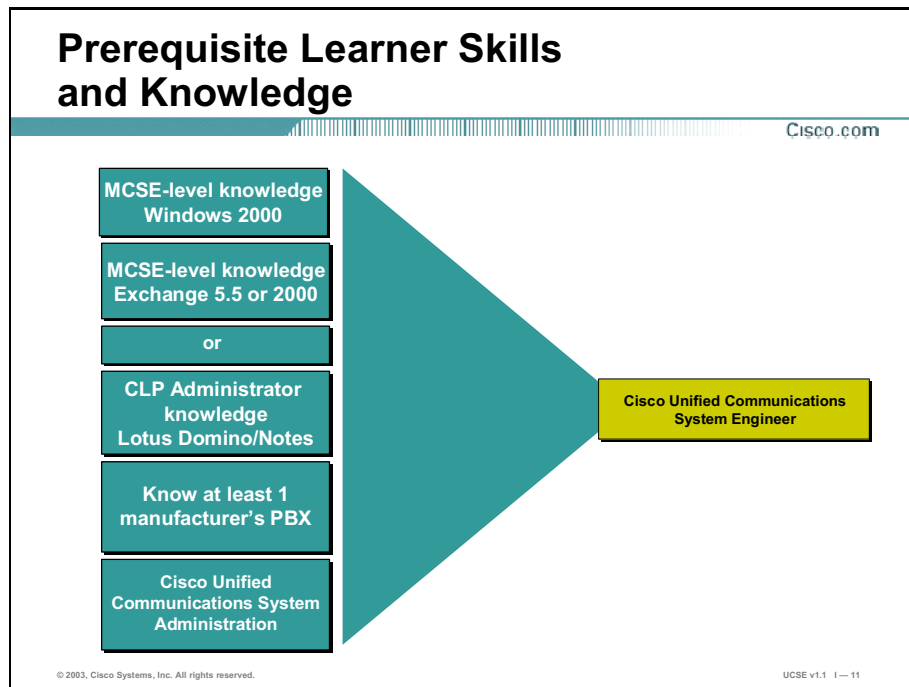
To fully benefit from this course, you must have these prerequisite skills and knowledge:

■ MCSE-level knowledge of Windows 2000

— MCSE-level knowledge of the Exchange 2000

or

— CLP Administrator-level knowledge of the Lotus Domino messaging environment

■ A working knowledge of the features, benefits and programming of at least one manufacturer's PBX (CallManager preferred).

■ Already attended UCSA v1.0 or possess equivalent knowledge.

Learner Responsibilities

This section discusses the responsibilities of the learners.
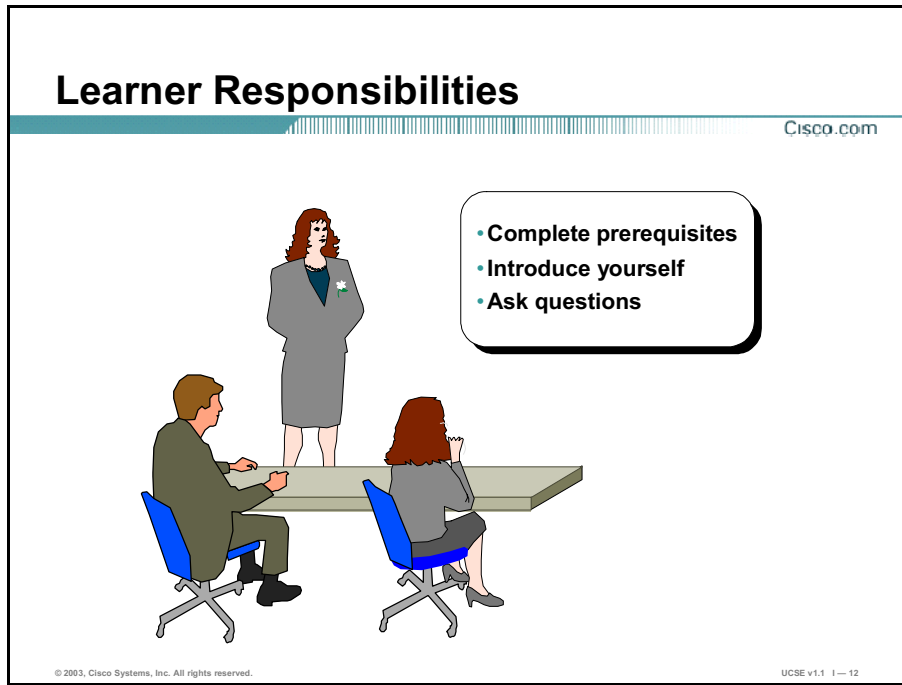
To take full advantage of the information presented in this course, you must have completed the prerequisite requirements.

In class, you are expected to participate in all lesson exercises and assessments.

In addition, you are encouraged to ask any questions relevant to the course materials.

If you have pertinent information or questions concerning future Cisco product releases and product features, please discuss these topics during breaks or after class. The instructor will answer your questions or direct you to an appropriate information source.

General Administration

This section lists the administrative issues for the course.

General Administration

Class-Related
- **Sign-in sheet**
- **Length and times**
- **Break and lunch room locations**
- **Attire**

Facilities-Related
- **Course materials**
- **Site emergency procedures**
- **Rest rooms**
- **Telephones/faxes**

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The instructor will discuss the administrative issues noted here so you know exactly what to expect from the class.

- Sign-in process

- Starting and anticipated ending times of each class day

- Class breaks and lunch facilities

- Appropriate attire during class

- Materials you can expect to receive during class

- What to do in the event of an emergency

- Location of the rest rooms

- How to send and receive telephone and fax messages

Course Roadmap

This section covers the suggested flow of the course materials.

Course Roadmap

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	Day 1	Day 2	Day 3
A M	Course Introduction	Telephone System Integrations	System Maintenance and backup
	U C Hardware	Digital Networking	U C Utilities
	U C Architecture	SMTP Networking	
	Lunch		
P M	Installing	VPIM Networking	System Troubleshooting
	Upgrading/Migrating	AMIS Networking	
		Bridge Networking	
	Ex. #1: Installing Unity	Exercise #2: Digital Networking	Course Summary

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The schedule reflects the recommended structure for this course. This structure allows enough time for the instructor to present the course information and for you to work through the laboratory exercises. The exact timing of the subject materials and labs depends on the pace of your specific class.

Learner Introductions

This is the point in the course where you introduce yourself.
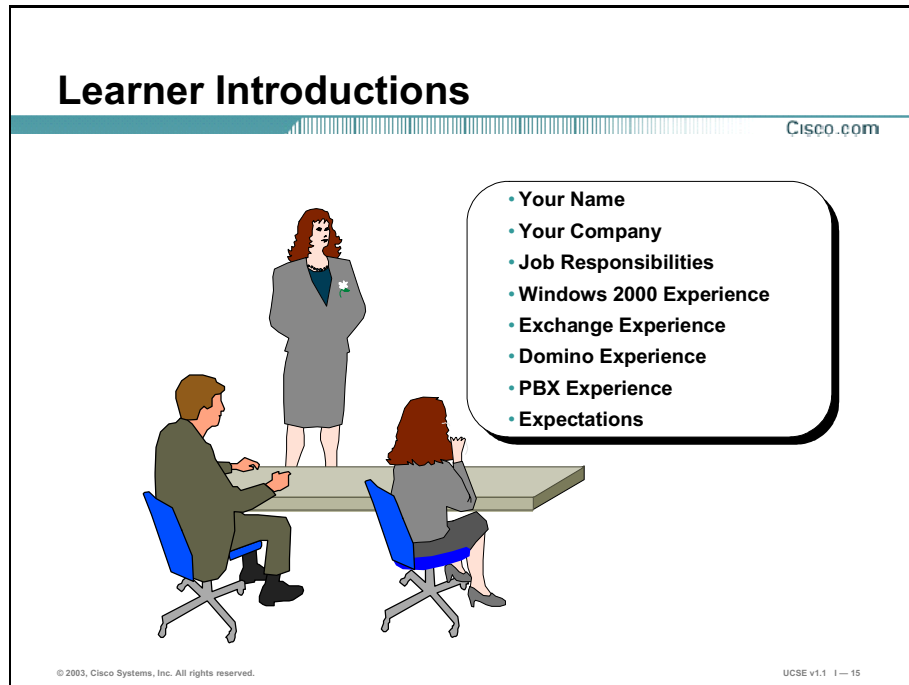
Prepare to share the following information:

- Your name

- Your company

- Your job responsibilities

- A profile of your experience with Windows 2000, Exchange, Domino, and telephone switches

- What you would like to learn from this course

Audience

This is the group of people whose needs we have focused on in writing this course.

Audience

We wrote this course primarily for people responsible for the technical side of Cisco unified communications systems installed in a unified messaging environment.

Main focus:

- **Installation**
- **Configuration**
- **Troubleshooting**

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We wrote this course primarily for people responsible for the technical side of Cisco unified messaging systems installed in a unified messaging environment: Cisco Unity engineers. We assume you are very familiar with Microsoft Windows 2000, Exchange 5.5 and/or Exchange 2000 or Lotus Domino/Notes and at least one manufacturer's PBX. This class focuses on the installation, configuration, and troubleshooting of Cisco Unity and/or Personal Assistant systems by a Cisco Unity engineer.

What to Expect from the Course

This section provides an in-depth look at the modules of the Cisco Unified Communications System Engineer course.

What to Expect From the Course

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- Introduction
- Cisco Unified Communications System Hardware
- Cisco Unified Communications System Software
- Cisco Unified Communications Integration
- Unified Communications Networking
- Unified Communications Maintenance and Utilities

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This course offers an in-depth look at installing, configuring and troubleshooting the Cisco Unity messaging system and/or the Cisco Personal Assistant system. The course is divided into several modules:

■ The *Introduction* module tells the student about the course, lists the course objectives and materials, and gives an overview of certification levels.

■ The *Cisco Unified Communications System Hardware* module gives students information about the hardware platforms and individual boards available for Cisco Unity and Personal Assistant and how to configure them. It gives students an understanding of the hardware requirements for servers of varying port capacity.

■ The *Cisco Unified Communications System Software* module helps students understand the software architecture of Cisco Unity and Personal Assistant and how the pieces relate to one another. This module discusses how to complete a successful installation of a Cisco Unity messaging system and a Personal Assistant system as well as how to perform an upgrade from earlier versions.

■ The *Cisco Unified Communications Integration* module describes telephone system integration features and methods, port status types, and details of the messaging system call progress analysis tools available in Cisco Unity and Personal Assistant.

■   The *Unified Communications Networking* module offers an in-depth look at the various ways that Windows 2000, Exchange, Personal Assistant and Cisco Unity work together to deliver messages, services, and synchronize directories both locally and in the enterprise.

■   The *Unified Communications Maintenance and Utilities* module addresses the utilities available to work on a Cisco Unity and Personal Assistant systems. Students gain an understanding of the tools and techniques at their disposal to ensure the system is running at optimum performance. In addition, students develop action plans for how to work with Cisco Unity or Personal Assistant when part of it is not working as expected.

Course Materials

This section provides information on course materials.

Course Materials

- **Online materials**
  - **Field Help**
  - **Online Documentation**
- **Student manual**
- **Cisco Unity and Personal Assistant systems**

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Cisco provides a great deal of material to help people understand Cisco Unity and Personal Assistant. One of the most comprehensive sources is the written documentation of the product. It is available is several forms with each having either a separate focus or a particular time when it would be most appropriate for use. This student manual will make reference to sections of the documentation rather than citing specific page numbers.

In addition, you have the student manual now in your hands. This document is not a repetition of the product documentation. What has already been said doesn't need to be repeated. There are, however, many topics that the documentation addresses, but gives no understanding of the context within which you would make a decision about the settings involved. This manual helps to address some of those contexts.

Finally, for the duration of the course, you will have access to a working Cisco Unity system and Personal Assistant system to experiment with and learn from.

Onscreen Help

**Field Help is available
by clicking the button below.**

**Online Documentation Help is
accessible by clicking the button below.**

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This course uses the Cisco documentation to help students learn to use Cisco Unity and Personal Assistant efficiently, but it also makes use of a few other sources. One is the on-line documentation available on every Cisco Unity system. This documentation takes two forms; field help, which explains what a particular field on one of the administration web pages does, and on-line documentation which is an electronic version of some of the information contained in the *Cisco Unity System Administration Guide*.

If you find that you need more information when you are working on the computer console, you can get help quickly by using one of the Help options available to you at the System Administrator console.

Field Help is always available by clicking the button. The information contained there describes what can be accomplished with the current field and what values can be entered in that field.

You access the second Help system by clicking the Online Documentation button . This help is just that, online documentation, accessed directly from the Cisco Unity console.

Unity Engineer (Field Engineer 2)

This section describes the currently available level of specialization on the Cisco Unity product.

Unity Engineer (Field Engineer 2 role)

- **Target**
  - **Reseller personnel installing Cisco Unity and/or Personal Assistant into new or existing Exchange or Domino environments**
- **Requirements**
  - **http://www.cisco.com/warp/public/765/partner_programs/ specialization/services/iptelephony/exam.pdf**
  - **Current MCSE Certification with current Exchange certification**
  - ***Cisco Unified Communications System Administration* and *Cisco Unified Communications System Engineer* courses**
- **Successful completion of test (9E0-805)**

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Cisco Unity System Engineer (for reseller technicians who wish to fill the Field Engineer 2 role in the IP Telephony Revised specification of the Cisco Channel Partners program.)

Cisco Unity works within the complex field of convergence applications. Technicians working with it at the highest levels are required to have a great deal of expertise. Cisco Unity relies on the services provided by the Windows operating system and the Exchange or Lotus Domino messaging platform to accomplish many of its routine tasks. For this reason we request that a technician hold a current MCSE certificate.

■   Microsoft Certified Systems Engineer (MCSE)

> Exchange, though an elective in the MCSE curriculum is required for Cisco Unity Engineers. Cisco Unity makes use of either Exchange 5.5 or Exchange 2000, so either test will be acceptable.

In addition a technician must complete the following courses and pass the Prometric or VUE test.

■   Cisco Unified Communications System Administration (UCSA v1.0)

■   Cisco Unified Communications System Engineer (UCSE v1.0)

We strongly recommend a TCP/IP course as well.

Overall Course Goal

This section provides the overall course goal. The task objectives technicians must accomplish to attain that goal have been listed earlier in this introduction.

Overall Course Goal

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To provide Cisco unified communications customers with the information needed to install, maintain, troubleshoot and support Cisco Unity and Personal Assistant systems as efficiently as possible.

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Our goal in presenting this course is to equip students to install, maintain, troubleshoot and support Cisco unified messaging systems in as self-sufficient manner as possible. Cisco is very willing to provide whatever level of support is needed or desired by its customers, but we are well aware that customers respond best to service that is quick, efficient and effective. Well-trained personnel help to meet those goals.

Additional Sources of Information

This section provides details on where you can find additional information.

Additional Information

All Cisco Unity and Personal Assistant manuals are available on the Cisco.com website. The following may be helpful during this course:

- *Cisco Unity Installation Guide*
- *Cisco Unity Troubleshooting Guide*
- *Cisco Unity Integration Guides*
- *Cisco Personal Assistant Administration Guide*
- *Cisco Personal Assistant User's Guide*

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As you proceed through the course, you may want to print a copy (or have one available electronically) to refer to of one or more of the user assistance manuals that are available on the Cisco.com website. Keep them handy as you complete the course, so that you can quickly find additional information whenever you need it. Here's a list of the manuals you should have access to:

■ Cisco Unity Installation Guide

— The *Cisco Unity Installation Guide* provides information useful for technicians who must install, maintain, upgrade or troubleshoot a Cisco Unity system. One copy of the *Installation Guide* is provided with each system.

■ Cisco Unity Troubleshooting Guide

— The *Cisco Unity Troubleshooting Guide* provides information useful for technicians who are experiencing difficulty with and must troubleshoot a Cisco Unity system.

■ Cisco Unity Integration Guides

— There are several *Cisco Unity Integration Guides.* They each provide information useful for technicians who must install a Cisco Unity system and integrate it with a

particular telephone system that has special hardware and/or software requirements. They are used in conjunction with the *Cisco Unity Installation Guide*.

■ Cisco Personal Assistant Administration Guide

— The *Cisco Personal Assistant Administration Guide* provides information useful for technicians who must install a Cisco Personal Assistant system and integrate it with a Cisco CallManager IP-PBX.

■ Cisco Personal Assistant User's Guide

— The *Cisco Unity Personal Assistant User's Guide* provides information useful to end users of Personal Assistant systems. Topics include: how to use PA to make and forward calls and access voice mail; how to set up destinations for incoming calls, a Personal Address book, caller groups, and rules for incoming calls; and how to customize PA for personal use.

We use the current versions of all of these manuals. A major objective of this course is to help you to understand which manual or Help system to use in different circumstances. We will direct you to specific parts of the manual or Help system, as they are appropriate.

Summary

This section summarizes the concepts you learned in this chapter.

Summary

Upon completion of this module, you should be able to:

- Describe the course and the targeted audience.

- Understand the course expectations.

- Describe the course prerequisites.

- Understand the overall course goal.

- Identify where to find additional help and information.

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Cisco Unified Communications System Hardware

Module Overview

Before you install any operating system or other software, you must first consider the hardware to be used. A system must meet or exceed minimum hardware requirements to perform at acceptable levels. Problems resulting from inadequate hardware can range from unacceptable access times to complete failure to install the necessary software. Fortunately, it is easy to get information about the hardware requirements of a Cisco Unity or Personal Assistant server. In this section, we will describe the platform overlay scheme as well as the systems that Cisco supplies at the time of this writing. By reviewing the platform overlay scheme as well as these systems, you should have a good understanding of what it takes to support a Cisco Unity or Personal Assistant server.

We will also address the necessary ancillary hardware needed for a Cisco Unity server working with a circuit-switched PBX or a Unity Bridge working as an Octel messaging node, voice boards.

Upon completing this module, you will be able to:

- Identify if a computer system meets the minimum hardware requirements for a Cisco Unity system or explain why it does not.

- Identify if a computer system meets the minimum hardware requirements for a Personal Assistant system or explain why it does not.

- Determine if a voice board that has a particular hardware set up is correct for a Cisco Unity system or explain how to correct it.

- Determine if a voice board that has a particular hardware set up is correct for a Unity Bridge system or explain how to correct it.

Outline

The module contains these lessons:

- Unified Communications Server Hardware

- Unified Communications Voice Boards

Unified Communications Server Hardware

Lesson Overview

Before you install any operating system or other software, you must first consider the hardware to be used. In this section, we will describe the platform overlay scheme as well as the systems that Cisco supplies at the time of this writing. By reviewing the platform overlay scheme as well as these systems; you should have a good understanding of what it takes to support a Cisco Unity or Personal Assistant server.

Importance

A system must meet or exceed minimum hardware requirements to perform at acceptable levels. Problems resulting from inadequate hardware can range from unacceptable access times to complete failure to install the necessary software. Fortunately, it is easy to get information about the hardware requirements of a Cisco Unity or Personal Assistant server.

Objectives

Upon completing this lesson, you will be able to:

■   Identify if a computer system meets the minimum hardware requirements for a Cisco Unity system or explain why it does not.

■   Identify if a computer system meets the minimum hardware requirements for a Personal Assistant system or explain why it does not.

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

- General knowledge of corporate messaging needs and server sizing to meet those needs

- Cisco Unity server platform overlay levels and port sizes

- Personal Assistant features and levels of service

Outline

This lesson includes these sections:

- Overview

- Cisco Unity Platform Overlay Levels

- Cisco Unity Supported Platforms List

- Personal Assistant Hardware Systems

- Summary

Cisco Unity Platform Overlay

This section describes the five platform overlay levels in detail. It gives examples of the types of servers that are qualified at each level and the organization size best served by each.

Platform Overlays

Platform Overlays

Platform Overlay	PO #1	PO # 2	PO # 3	PO # 4	PO # 5
Description	Single processor Single hard drive 512 MB RAM	Single processor 2 hard drives - RAID 1 512 MB RAM	Dual processors 2 hard drives – RAID 1 3 hard drives – RAID 5 1.0 GB RAM	Quad capable Dual processors 4 hard drives – RAID 1 (X 2) 3 hard drives – RAID 5 2 GB RAM	Quad capable Quad processors 4 hard drives – RAID 1 (X 2) 3 hard drives – RAID 5 4 GB RAM

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The computers that manufacturers make available change specification very quickly. Processor speeds continue to increase; the amount of RAM and available hard drive space continues to increase as well. To address this rapid rate of change, Cisco Systems has chosen to implement platform overlays as a way of describing servers at five different levels of capacity. Platform overlay #1 is the entry-level server; platform overlay #5 is the most robust of the servers. You will look at each platform overlay level in more detail. Examples of servers currently shipped by Cisco Systems and servers available from other suppliers are given at each overlay level. In addition, you will look at what size organization could make best use of a server at that platform overlay level.

If it is appropriate, differences between platform overlay levels will be highlighted and explained.

Platform Overlay #1

Unity 4.0 Platform Overlay #1

MCS 7827

HP DL320 G1

Dell 1400SC

IBM x205

Ports	VM Users	CPCA Sessions	UM Users	TTS
16	499	50	499	8

Single Processor
512 MB RAM
One ATA HDD
Storage Time – 476 hours (G711)
Storage Time – 3,811hours (G729a)

Cisco shipped

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Platform overlay #1 is an entry-level server appropriate for small systems. As you can see, it will support up to 16 ports (sessions), 499 voice mail or unified messaging users, 8 text-to-speech sessions and 50 Cisco Personal Communications Assistant (CPCA) sessions. The Media Convergence Server (MCS) 7827 system has a single 1.13 GHz Pentium III processor, 512 Mb of RAM, a DVD-ROM drive and one 40 GB ATA hard drive. In addition to the MCS 7827, Cisco also ships the IBM x205 server, which has a single 2.0 GHz Pentium 4 in addition to the 512 MB of RAM, DVD and 40 GB ATA hard drive

The storage times given are for voice mail deployments with a local message store only and are for the two most common recording formats for Unity messages; G711 and G729a. These times assume an 8GB system partition, half of addressable drive space is reserved for recovery and Exchange Standard Edition. This system would be most appropriate for small office/branch office installations.

Platform Overlay #2

Unity 4.0 Platform Overlay #2

MCS7837

Dell 2500/2600

HP DL380 G2

HP ML370 G2

IBM x232

IBM x345

Ports	VM Users	CPCA Sessions	UM * Users	TTS
32	1100	100	1599	16

Single Processor
512 MB RAM
Two IDE HDD (RAID 1)
Storage Time – 427 hours (G711)
Storage Time – 3,414 hours (G729a)

Cisco shipped
* - Or VM with off-box store(s)

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Platform overlay #2 is appropriate for mid-sized systems. As you can see, it will support up to 32 ports (sessions), 1100 voice mail or 1599 unified messaging (or VM users if all message boxes are "off-box"), 16 text-to-speech sessions and 100 CPCA sessions. The MCS 7837 system has a single 1.26 GHz Pentium III processor, 512 Mb of RAM, a DVD-ROM drive and two 36 GB Ultra 160 hard drives in a RAID 1 (mirrored) configuration. Cisco also ships the IBM x345 server that has a single 2.0 GHz Prestonia Xeon processor in addition to the 512 MB of RAM, DVD and identical hard drive setup.

The storage times given are for voice mail deployments with a local message store only and are for the two most common recording formats for Unity messages; G711 and G729a. These times assume an 8GB system partition, half of addressable drive space is reserved for recovery and Exchange Standard Edition. This system would be most appropriate for larger office installations where a separate domain controller is needed. The system, with mirrored drives for some fault tolerance is still somewhat limited in storage space.

Platform Overlay #3

Unity 4.0 Platform Overlay #3

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MCS7847

Dell 2500/2600

Dell 4600

HP DL380 G2

HP ML370 G2

IBM x232

IBM x345

Ports	VM Users	CPCA Sessions	UM * Users	TTS
48	2200	150	2500	24

Dual Processors
1 GB RAM
5 IDE HDD
(1 RAID 1, 1 RAID 5)
Storage Time – 1,121 hours (G711)
Storage Time – 8,969 hours (G729a)

Cisco shipped
* - Or VM with off-box store(s)

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Platform overlay #3 is appropriate for mid-sized to large sized systems. It will support up to 48 ports (sessions), 2200 voice mail or 2500 unified messaging (or VM users if all message boxes are "off-box"), 24 text-to-speech sessions and 150 CPCA sessions. The MCS 7847 system has dual Tualatin 1.26 GHz Pentium III processors, 1.0 GB of RAM, a DVD-ROM drive and two 18 GB Ultra 160 hard drives in a RAID 1 (mirrored) configuration and three 36 GB Ultra 160 hard drives in a RAID 5 array. Cisco also ships the IBM x345 server. In this configuration the x345 has dual 2.0 GHz Prestonia Xeon processors in addition to 1.0 GB of RAM, DVD and an identical hard drive setup.

The storage times given are for voice mail deployments with a local message store only and are for the two most common recording formats for Unity messages; G711 and G729a. These times assume an 8GB system partition, half of addressable drive space is reserved for recovery and Exchange Standard Edition.

Platform Overlay #4

Unity 4.0 Platform Overlay #4

Dell PE 66XX Series

HP DL580 G1

HP ML570 G1

IBM x255

Ports	VM Users	CPCA Sessions	UM * Users	TTS
72	3000	200	7500	36

Dual Processors
2 GB RAM
7 IDE HDD
(2 RAID 1, 1 RAID 5)
Storage Time – 1,121 hours (G711)
Storage Time – 8,969 hours (G729a)

Cisco shipped
* - Or VM with off-box store(s)

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Overlay #4 is appropriate for large deployments where performance is crucial. As you can see, it will support up to 72 ports (sessions), 3000 voice mail or 7500 unified messaging (or VM users if all message boxes are "off-box"), 36 text-to-speech sessions and 200 CPCA sessions. The HP ML570 G1 system has dual 900 MHz Cascades Xeon processors, 2 GB of RAM, a DVD-ROM drive and seven hard drives; four 18 GB Ultra 160 hard drives in two RAID 1 (mirrored) configurations and three 36 GB drives in a RAID 5 array. Cisco also ships the IBM x255 server that has dual 1.4 GHz Foster Xeon processors in addition to the 2 GB of RAM, and DVD. Its hard drive setup has the same four 18 GB drives arranged as two RAID 1 mirrored sets, but the three drives in the RAID 5 array are each 72 GB in size.

The storage times given are for voice mail deployments with a local message store only and are for the two most common recording formats for Unity messages; G711 and G729a. These times assumes half of addressable drive space is reserved for recovery and Exchange 2000 Enterprise Edition. This is a high-end server that is critical for larger VM and UM systems. With the addition of a second mirror set (especially important when using as a VM system or large external message store) this server allows you to separate the Exchange transaction logs from the application logs, allowing for greater performance and minimizing problems from Exchange log stalls.

Platform Overlay #5

Unity 4.0 Platform Overlay #5

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Dell PE 66XX Series

HP DL580 G1

HP ML570 G1

IBM x255

Ports	VM Users	CPCA Sessions	UM * Users	TTS
72	3000	300	7500	36

Quad Processors
4 GB RAM
7 IDE HDD
(2 RAID 1, 1 RAID 5)
Storage Time – 2,245 hours (G711)
Storage Time – 17,964 hours (G729a)

Cisco shipped
* - Or VM with off-box store(s)

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Platform overlay #5 is appropriate for large deployments where performance is crucial. As you can see, it will support up to 72 ports (sessions), 3000 voice mail or 7500 unified messaging (or VM users if all message boxes are "off-box"), 36 text-to-speech sessions and 300 CPCA sessions. The HP ML570 G1 system is identical to the Platform overlay #4 machine with the exception of quad processors and an additional 2 GB of RAM (for a total of 4 GB). The IBM x255 server has four 1.4 GHz Foster Xeon processors in addition to the same 4 GB of RAM, DVD and identical hard drive setup.

The storage times given are for voice mail deployments with a local message store only and are for the two most common recording formats for Unity messages; G711 and G729a. These times assume half of addressable drive space is reserved for recovery and Exchange 2000 Enterprise Edition. This is a high-end server that is critical for larger VM and UM systems. With the additional processors and extra RAM it is capable of supporting more CPCA and text-to-speech sessions.

Cisco Unity Supported Platforms List

This section provides information about which servers are qualified for use with Cisco Unity.

CUSPL

Cisco.com

Includes Information on

Previously Cisco-shipped servers
•10 servers with 13 configurations

Current Cisco-shipped servers
•6 servers with 10 configs

Customer-provided servers
•15 servers with 24 configs

Located at:

http://www.cisco.com/en/US/products/sw/voicesw/ps2237/products_data_sheet09186a008009267e.html

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You may have questions about what server hardware may appropriately run Cisco Unity software. You have already looked at the currently shipped hardware from Cisco. You or your customer may have a server previously shipped by Cisco and want to know if it may be used to run Cisco Unity 4.0, saving the cost of purchasing new server hardware. Customers may elect to purchase servers from a vendor other than Cisco for a variety of reasons. You'll notice that some of the servers are the same (or are OEM variants of) servers that Cisco offers. Cisco has qualified the following servers to give partners and end users a variety of choices. This list serves as Cisco's hardware compatibility list. The specifications provided for each server are the ones tested with Cisco Unity.

The list located at the URL provided on the slide is kept up-to-date and contains the most current information about what servers may be used with Cisco Unity.

CUSPL Sample

CUSPL - sample

Cisco.com

CMCS 7837

Cisco-shipped

Platform Overlay 2

Up to 32 ports

IP, dual and traditional integrations

3 total slots available for voice boards:

1 usable with standard PCI boards

3 usable with universal PCI boards

Expansion chassis supported for additional voice boards

Up to 1599 users for Unified Messaging (message store off the Cisco Unity server)

Up to 1100 users for Voice Messaging

Up to 100 Visual Messaging Interface (VMI) users

Up to 12 text to speech (TTS) sessions – Unity 3.1x

Up to 16 text to speech (TTS) sessions – Unity 4.0

Single Pentium III 1.26 GHz processor

512 MB RAM

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The information on the slide is an example of that found on the Cisco Unity Supported Platforms list. Detailed information about the server's hardware capabilities, as well as the Cisco Unity feature support levels, is given in the document.

Personal Assistant Hardware Systems

This section provides information on the server platforms available for use with Cisco Personal Assistant.

Cisco Personal Assistant is designed to run on specific hardware platforms. These are listed above. In addition, you may use the HP servers that are equivalent to the MCS platforms mentioned.

MCS 7825 -1133

Information on the base level server available for use with Personal Assistant is provided here.

MCS 7825 - 1133

1.133 GHz Pentium III Processor

512 MB RAM

20 GB ATA Hard drive

1RU

PA software support levels

The entry-level server available for Personal Assistant possesses the following hardware:

- 1.133 GHz Pentium III processor

- 512 MB of 133MHz Registered ECC SDRAM

- 1 20 GB Ultra ATA/100 7200 RPM hard drive with an integrated Ultra ATA/100 controller

The system is capable of supporting 22 Interceptor port sessions and 20 Media port sessions simultaneously. These capabilities will allow the system to support approximately 550 PA users (Interceptor port sessions) and 1000 speech recognition sessions (Media port sessions). This same server will support 50 Interceptor ports (approximately 1100 users) or 24 Media ports (approximately 1200 users) if they are installed on separate MCS 7825-1133 servers.

MCS 7835 - 1266

Information on the more robust server available for use with Personal Assistant is provided here.

MCS 7835 - 1266

Cisco.com

1.266 GHz Pentium III Processor

1 GB RAM

2 x 18 GB, Ultra 160 Hard drives

3RU

PA software support levels

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The more powerful server available for Personal Assistant possesses the following hardware:

■ 1.266 GHz Pentium III processor

■ 1 GB of 133MHz Registered ECC SDRAM

■ 2 18.2 GB Ultra3 SCSI hot-pluggable drives with an integrated dual-channel wide Ultra SCSI-3 controller

The system is capable of supporting 30 Interceptor port sessions and 24 Media port sessions simultaneously. These capabilities will allow the system to support approximately 660 PA users (Interceptor port sessions) and 1200 speech recognition sessions (Media port sessions). This same server will support 70 Interceptor ports (approximately 1540 users) or 36 Media ports (approximately 1800 users) if they are installed on separate MCS 7835-1266 servers.

Summary

This section summarizes the key points discussed in this lesson.

Summary

Upon completion of this lesson, you should be able to perform the following tasks:

- **Identify if a computer system meets the minimum hardware requirements for a Cisco Unity system or explain why it does not.**

- **Identify if a computer system meets the minimum hardware requirements for a Personal Assistant system or explain why it does not.**

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Next Steps

After completing this lesson, go to:

■ Cisco Unified Communications Voice Boards

References

For additional information, refer to these resources:

■ **http://www.cisco.com/en/US/products/sw/voicesw/ps2237/products_data_sheet09186a008009267e.html**

Unified Communications Voice Boards

Lesson Overview

You use voice boards to integrate Cisco Unity with a circuit-switched PBX either alone or in combination with a Cisco CallManager. You may also use voice boards in a Unity Bridge server to communicate with an Octel voice mail node. The PBX you are integrating with dictates the voice board(s) you use and the number of voice mail ports that will be connected to that switch determines the number of boards.

Importance

All voice boards in a Cisco Unity system run as a service on which it is dependent. As you bring a Cisco Unity server on line, the voice board service must initialize first. If, for some reason, the voice boards do not initialize and start their service properly, Cisco Unity will be unable to start. Later, in the Unified Communications Maintenance and Utilities module of the course, we will look at how to diagnose problems related to failure in a voice board or its service. In this lesson you will learn how to configure voice boards correctly to avoid one cause of these difficulties.

Objectives

Upon completing this lesson, you will be able to:

■ Determine if a voice board that has a particular hardware set up is correct for a Cisco Unity system or explain how to correct it.

■ Determine if a voice board that has a particular hardware set up is correct for a Unity Bridge system or explain how to correct it.

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

- General knowledge of corporate messaging needs and server sizing to meet those needs

- Cisco Unity server platform overlay levels and port sizes

- Personal Assistant features and levels of service

- An understanding of Cisco Unity integration with circuit-switched PBXes

Outline

This lesson includes these sections:

- Overview

- What are voice boards and why might you need them?

- Intel/Dialogic D/41EPCI

- Intel/Dialogic D/120JCT-LS and D/120JCT-Euro

- Intel/Dialogic D/240PCI-T1

- Brooktrout Technology TR114+P4L PCI

- Summary

What are Voice Boards and Why Might You Need Them?

This section describes the situations for which a voice board is necessary and then describes what functions they perform.

Why Use Voice Boards?

When integrating Cisco Unity with a circuit-switched PBX

When implementing a Unity Bridge

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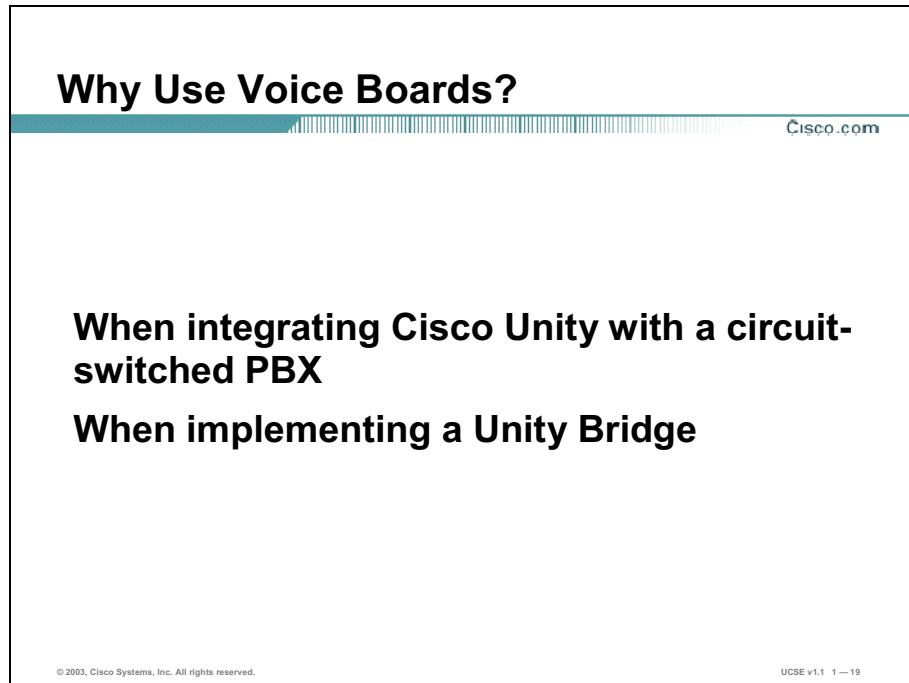
When you integrate a Cisco Unity system with CallManager, all communications between the two systems take place over the LAN/WAN they are both connected to. When you connect Cisco Unity with any circuit-switched PBX, you must provide a channel of communication between the devices. Circuit-switched PBXes are designed to provide service to telephone extensions. Any device connected with a PBX must therefore act like a telephone. Voice boards do that for Cisco Unity. It is perhaps easiest to think of a voice board as a collection of 4, 12 or 24 single-line extensions on one card.

Unity Bridge communicates with Octel voice mail systems over the PSTN using Octel's analog messaging protocol. Voice boards in the Unity Bridge system provide it with a way to communicate with the PSTN and the Octel system.

What functions do voice boards perform?

**Communication with a telephony-based device
Analog/Digital and Digital/Analog conversion**

With a combination of hardware and software, voice boards perform the same functions any person does as they use a telephone. A voice board can initiate a call, send dual-tone, multiple-frequency (DTMF) tones to dial a number, interpret sound energy on the open phone line as dialtone, ringing, or busy signals, and interpret DTMF tones it receives. Each of these are things that any person does using the telephone (with the exception of interpreting received DTMF tones). The voice board must perform all of these functions to provide service to Cisco Unity.

The second function voice boards perform is the digital-to-analog conversion necessary when playing the digital files it receives from Cisco Unity (either system prompts or a subscriber's recorded greeting) that must be played over the analog PSTN so that a subscriber or outside caller may hear them. It also provides the analog-to-digital conversion necessary when a message, greeting, or voice name is spoken over the telephone network and is then converted into a digital file residing on a server's hard drive.

Intel/Dialogic D41E PCI, D/41JCT-LS and D/41JCT-Euro

Intel Dialogic D/41EPCI, D/41JCT-LS, and D/41JCT-Euro

Cisco.com

- **4 port board, 4 RJ-11 connectors**
- **All boards share same base memory address and IRQ (set by software)**
- **Unique hardware ID (SW1) for each board**
- **Set SW2, JP2 – JP7**

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For all circuit-based switches using DTMF or SMDI integration

■ 4 port DSP board.

■ Four RJ-11 connectors

■ All boards in one system share the same IRQ and base memory address.

■ Set SW2 switches to off as shown in the *Cisco Unity Installation Guide*.

■ Set jumpers JP2 through JP7 as shown in the *Cisco Unity Installation Guide*.

■ A 16 position rotary switch (SW1) manually identifies each board in a system, the first board is set to ID 1, and the second is ID 2 etc.

■ Each board is configured using DCM - Dialogic's configuration utility. This utility writes information into the Registry.

Specific information about the configuration of each board in the D/41series is contained in the *Cisco Unity Installation Guide*, Appendix A.

Intel/Dialogic

Intel Dialogic D/120JCT-LS and D/120 JCT-Euro

Cisco.com

- **12 port board, 6 RJ-14 connectors**
- **All boards share same base memory address and IRQ (set by software)**
- **Unique board ID (SW100) is the only hardware configuration needed**
- **Set SW1 to On-hook**
- **LS used in North America, South America and Japan**
- **Euro used in Europe, Australia, and New Zealand**
  - **Select country in Dialogic Configuration Manager (DCM)**

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- 12 port DSP board.

- Uses six RJ-14 connectors, ports 1 and 2 use the top connector, ports 11 and 12 use the bottom.

- All boards in one system share the same IRQ and base memory address.

- A 16 position rotary switch (SW100) manually identifies each board in a system; the first board is set to ID 1, and the second is ID 2 etc.

- Set SW1 to On-hook for each board, otherwise they will not answer calls.

- Each board is configured using Dialogic Configuration Manager-DCM. This utility writes information into the Registry.

Specific information about the configuration of each D/120JCT-LS or D/120JCT-Euro board is contained in the *Cisco Unity Installation Guide* in Appendix A.

Intel Dialogic D/240PCI-T1

Intel Dialogic D/240PCI-T1

- **24 port board, 1 RJ-48C connector**
- **All boards share same base memory address and IRQ (set by software)**
- **Unique board ID(SW100) for each board is needed.**
- **Must set jumpers JP2 - JP7**
- **Must set board protocol manually**
- **T-1 lines provide voice channel; integration information is on serial cable**

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- 24 port DSP board

- Uses 1 RJ-48C connector

- All boards in one system share the same IRQ and base memory address

- A 16 position rotary switch (SW100) manually identifies each board in a system, the first board is set to ID 1, and the second is ID 2 etc

- Each board is configured using Dialogic Configuration Manager-DCM. This utility writes information into the Registry

- Configure the board's protocol using the instructions in Appendix A of the *Cisco Unity Installation Guide*

Specific information about the configuration of each D/240PCI-T1 board is contained in the *Cisco Unity Installation Guide* in Appendix A.

Brooktrout Technology TR114+P4L

Brooktrout Technology TR114+P4L

- **4 port board, 1 RJ-45 connector**
- **Each board includes cable with one RJ-45 end and 4 RJ-14 connectors at the other end**
- **Pinouts available in *Cisco Unity Bridge Installation Guide*, Appendix A**
- **All boards share same base memory address and IRQ (configured by platform BIOS)**

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- 4 port DSP board

- Uses 1 RJ-45 connector

- Each board is supplied with a cable that has an RJ-45 plug at one end and 4 RJ-14 connectors at the other end

- All boards in one system share the same IRQ and base memory address

Specific information about the configuration of the IRQ and memory address is located in the Bridge server hardware documentation.

Summary

This section summarizes the key points discussed in this lesson.

Summary

Upon completion of this chapter, you will be able to perform the following tasks:

- Given a voice board that has a particular hardware set up, determine if this setup is correct for a Cisco Unity system or explain how to correct it.

- Given a voice board that has a particular hardware set up, determine if this setup is correct for a Unity Bridge system or explain how to correct it.

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Next Steps

After completing this lesson, go to:

■ Cisco Unified Communications System Software

References

For additional information, refer to these resources:

■ *Cisco Unity Installation Guide (With Microsoft Exchange)*

■ *Cisco Unity Installation Guide (With IBM Lotus Domino)*

■ *Cisco Unity Bridge Installation Guide*

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Cisco Unified Communications System Software

Module Overview

In this module we describe Cisco's various unified communications architectures. We look at the architecture for Cisco Unity for Exchange, Cisco Unity for Domino, and Cisco Personal Assistant. We describe the software necessary for a proper installation of all the unified communications products. We will install the Cisco Unity software and describe the various steps of the Cisco Unity System Preparation Assistant (CUSPA) and the Cisco Unity Installation and Configuration Assistant (CUICA). We also discuss the upgrade process for the Cisco unified systems.

Upon completing this module, you will be able to:

■ Describe Cisco's various unified communications architectures

■ Describe the software needed to perform a successful installation of the unified products

■ Install the Cisco Unity system

■ Describe the use of CUSPA and CUICA

■ Describe the upgrade process for the Cisco unified communications products

Outline

The module contains these lessons:

■ Unified Communications Architecture

■ Unified Communications Software

■ Installing Cisco Unified Communications Software

■ Upgrading Cisco Unified Communications Software

Unified Communications Architecture

Lesson Overview

In this lesson we explore the architecture of the Cisco Unity unified messaging systems. We also discuss the architecture of the Cisco Personal Assistant.

Importance

Cisco Unity and Cisco Personal Assistant are based on a very robust architecture. Understanding that structure will aid in the proper installation and maintenance of the systems. An understanding of the interactions between the various software components upon which the Cisco unified communications products are built will greatly aid in the troubleshooting of the products.

Objective

Upon completing this lesson, you will be able to:

- Describe Cisco's various unified communications architectures

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

- General knowledge of the Windows 2000 operating system

- Knowledge of Microsoft Exchange and/or Lotus Domino

- General knowledge of corporate messaging needs

Outline

This lesson includes these sections:

- Overview

- Cisco Unity for Exchange Architecture

- Cisco Unity for Domino Architecture

- Cisco Personal Assistant Architecture

- Summary

Cisco Unity for Exchange Architecture

This section describes the Cisco Unity for Exchange architecture.

Cisco Unity 4.0 Unified Architecture with Exchange Message Store
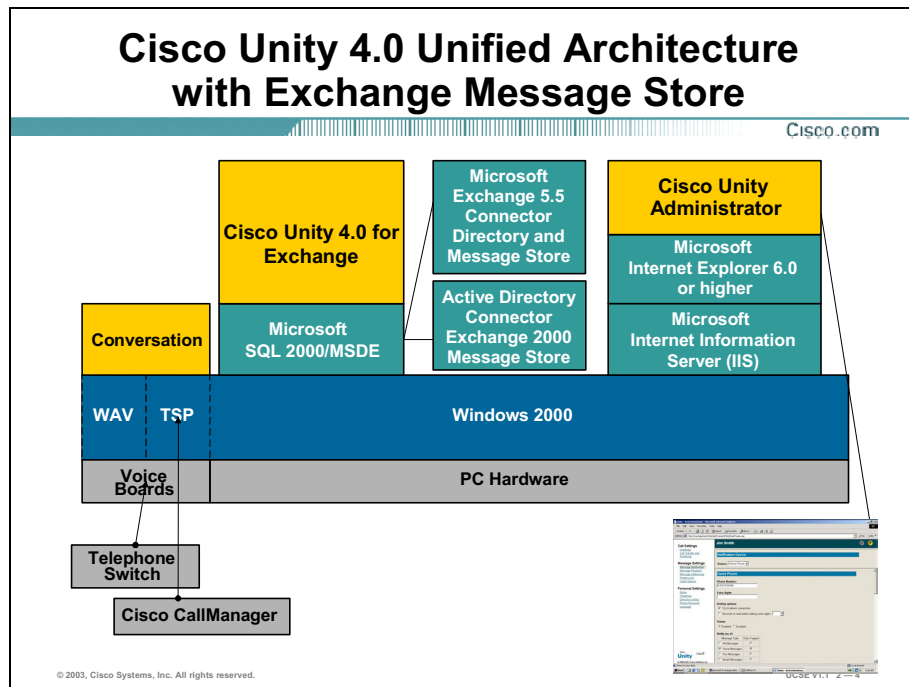
At the base of any Cisco Unity system is the hardware. Cisco sells Cisco Unity on several platforms, which we discussed in the Unified Communications Server Hardware module. Cisco Unity runs on Microsoft's Windows 2000 Server (or Enterprise) operating system. Cisco Unity uses the Windows 2000 Active Directory to store a minimum amount of user data. The vast bulk of information is stored in a SQL database. When you use the Cisco Unity Administration Active Server pages (ASP) to add delete, or modify a Cisco Unity subscriber you are modifying the SQL database. Cisco Unity will use either Microsoft SQL 2000 Desktop Engine (MSDE) or Microsoft SQL 2000 software depending on your Cisco Unity configuration. The information is then passed on to Windows Active Directory through either the Microsoft Exchange Directory Connector for Exchange 5.5 or the Active Directory Connector for Exchange 2000. This choice is made during the Cisco Unity installation process.

Whether you integrate Cisco Unity to a Cisco CallManager or a circuit-based telephone system, you will need a physical connection between Cisco Unity and the telephone system. The physical connection for the Cisco CallManager integration is a connection to the site's LAN/WAN, while the connections for a circuit-based telephone system are physical voice cards installed on the Cisco Unity server. A discussion of various voice cards was covered in the Unified Communications Server Hardware module.

You will also need software drivers and a Telephony Service Provider (TSP) to run the hardware and a software interface to configure and modify the TSP settings. Unity Telephone Integration Manager (UTIM) installs the TSP provided by the manufacturer of the device that communicates with the PBX.

Cisco Unity passes subscriber messages to the appropriate Exchange message store. The message is then placed into the Cisco Unity subscriber's Exchange Inbox which is part of the Exchange Information Store (IS).

Subscriber messages are only stored on the Cisco Unity server in the VoiceMail only (VM) configuration, or when Cisco Unity's Message Repository (UMR) detects that the Exchange server is not available. Once the UMR detects Exchange is once again available the messages are passed through to the Exchange Information Store.

Hyper Text Markup Language (HTML)-based console screens allow access to the Cisco Unity system console. Cisco Unity uses Microsoft Internet Explorer 5.5 SP2 or Explorer 6.0, (recommended) to provide the HTML screens.

There will be a complete guide to the software components that make up the Cisco Unity system later in this module.

Cisco Unity for Domino Architecture

This section discusses the Cisco Unity for Domino architecture.

Cisco Unity 4.0 Unified Architecture with Domino Message Store
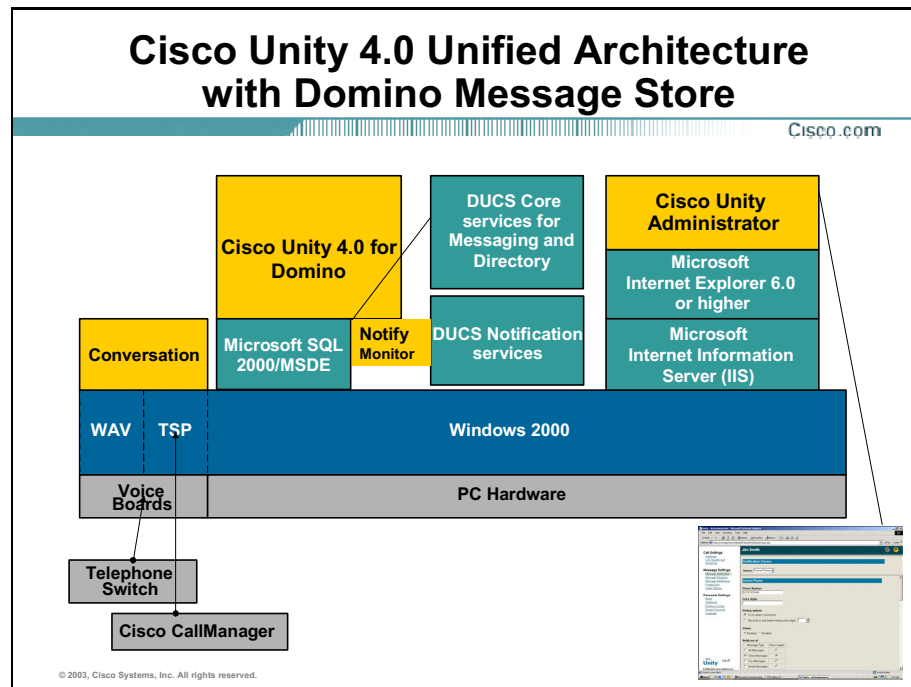
The underlying Cisco Unity for Domino architecture is much the same as that for Cisco Unity for Exchange.

In this configuration the Microsoft SQL 2000 or MSDE software will communicate with Lotus Domino through a Domino connector which is selected by the installer during the Cisco Unity installation process. Lotus has developed the Domino Unified Communications Service (DUCS) in order for Domino to integrate with Cisco Unity. DUCS must be installed on a Domino directory server in every domain, and on each Domino messaging server where a Unity subscriber mailbox exists. At present DUCS will require Domino version 5.0.10 or 5.0.11.

Lotus Notes software must also be installed on the Cisco Unity platform. This supplies the message notification function for Cisco Unity for Domino.

The Cisco Unity for Domino configuration will only be supported in a unified messaging environment with Lotus Domino services being installed off the Cisco Unity platform.

Cisco Personal Assistant Architecture

This section discusses the Cisco Personal Assistant architecture.

Cisco Personal Assistant Architecture
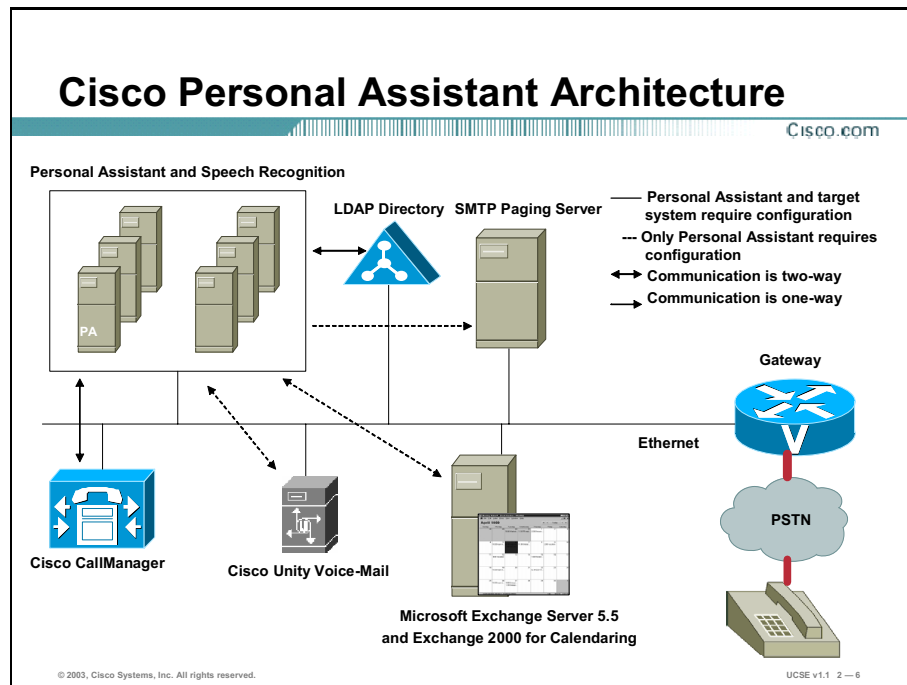
Personal Assistant 1.3 is installed on its own Cisco supported platform running the Microsoft Windows 2000 operating system. Supported platforms were discussed in an earlier part of the course.

Cisco Personal Assistant software consists of Cisco Personal Assistant Server, Personal Assistant Web Administration, and Personal Assistant Speech Recognition Server. The optional Speech Recognition software may be installed on a separate server for performance enhancement.

IP Phone Productivity Services, which enables Personal Assistant options to be accessed from the display on Cisco IP 7940 and 7960 display phones, is installed on its own server. To view your Outlook calendar on the display phone or for calendar-based routing rules, integration with Exchange 5.5 or later is required.

Cisco Personal Assistant integrates with Cisco CallManager 3.1 or higher. For name lookups in the corporate directory, the Cisco CallManager's integrated DC directory is required. (If not, a third party directory service such as Microsoft's Active Directory or Netscape Directory Services is required).

Voice mail functionality is added through integration with Cisco Unity version 2.4.6 or later.

Summary

This section summarizes the key points discussed in this lesson.

Summary

Cisco.com

Upon completion of this lesson, you should be able to perform the following tasks:

- **Describe the architecture of Cisco Unity 4.0 for Exchange**
- **Describe the architecture of Cisco Unity 4.0 for Domino**
- **Describe the architecture of Cisco Personal Assistant**

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Next Steps

After completing this lesson, go to:

- Unified Communications Software

References

For additional information, refer to these resources:

- Cisco Unity Design Guide
  http://www.cisco.com/univercd/cc/td/doc/product/voice/c_unity/design/index.htm

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Unified Communications Software

Lesson Overview

In this lesson we discuss the software upon which Cisco Unity's various unified communications systems are installed. We will look at the building blocks for Cisco Unity for Exchange, Cisco Unity for Domino, and Personal Assistant.

Importance

Understanding the structure upon which Cisco Unity and Cisco Personal Assistant are built will aid in the proper installation and maintenance of the systems. An understanding of the interactions between the various pieces of software upon which the Cisco Unified Messaging products are built will greatly aid in the troubleshooting of the products.

Objective

Upon completing this lesson, you will be able to:

■ Describe Cisco's various unified communications software

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

- An understanding of the concepts presented in the Cisco Unified Communications Architecture section

Outline

This lesson includes these sections:

- Overview

- System Software for Cisco Unity for Exchange

- System Software for Cisco Unity for Domino

- System Software for Cisco Personal Assistant

- Summary

System Software For Cisco Unity for Exchange

This section discusses the software components of Cisco Unity for Exchange

System Software for Cisco Unity (Exchange)

- **Windows 2000 SP3**
  - **Installed during Windows 2000 install:**
    - **MSMQ, NNTP, Internet Information Server 5.0**
- **Internet Explorer 6.0 SP1**
- **MSDE (32 ports or less) or SQL 2000 SP2 and hotfix**
- **Exchange 2000 SP2**
- **(Message Store software only shipped with VM systems)**
- **MSXML3 and MSXML3 SP1**
- **Unity 4.0**

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Cisco Unity systems use Windows 2000 as the operating system. Windows 2000 will be installed with different options depending on your Cisco Unity configuration. In order for Cisco Unity to function properly the following Windows 2000 components must also be installed: Internet Information Server (IIS), Windows 2000 Service Pack 2, Message Queuing Services, Terminal Services, and NNTP. Microsoft's Active Directory will need to be installed if Cisco Unity will be in VM only configuration and therefore in it's own domain. If, however, Cisco Unity will be joining an existing domain as a member server, the Active Directory option is not installed on the Unity server. The Cisco Unity server should not act as a DNS or DHCP server for the network.

Which Windows 2000 compact disc you use for installation of the operating system will depend on from whom you purchased the Cisco Unity server. If the server you intend to use for Cisco Unity was purchased from Cisco, you would install Windows 2000 from the Platform Configuration disc that came with the Cisco Unity server. However, if the server was not purchased from Cisco, you would use the OEM disc that came with the system. This disc contains OEM drivers for Compaq, Dell, or IBM that will allow you to then use a retail version of Windows 2000.

Microsoft Internet Explorer (I.E.) 6.0: This is Microsoft's Web browser that must be installed on the Windows 2000 server when using Information Internet Services (IIS). Cisco Unity does not support Netscape Navigator.

Microsoft's Extensible Markup Language: (MSXML3) and MSXML SP1 are installed and can be found on Cisco Unity CD 1.

Microsoft SQL Desktop Engine (MSDE) or Microsoft SQL 2000 SP2 : Both of these are database storage for all Cisco Unity attributes. Cisco Unity will require MSDE for systems 32 ports or less without the Cisco Unity Failover option. Cisco Unity systems greater than 32 ports or using the Failover option requires SQL 2000 with SP2 and the SP2 Hotfix.

Exchange 2000 or Exchange 5.5: This is Microsoft's email server. Cisco Unity will use the Message store of Exchange 2000 to store subscriber messages, and the Active Directory in Windows 2000. Cisco Unity can also be installed to integrate with Microsoft Exchange 5.5 with SP4. Beginning with the release of Cisco Unity 4.0, Cisco Unity installed in the unified messaging mode will only support Microsoft Exchange 2000 in an "off box" configuration, and the message store software will not be shipped with the other Cisco Unity software.

System Software for Cisco Unity for Domino

This section discusses the software components for Cisco Unity for Domino.

System Software for Cisco Unity (Domino)

Cisco.com

- **Windows 2000 SP3**
  - **Installed during Windows 2000 install:**
    - **MSMQ, NNTP, Internet Information Server 5.0**
- **Internet Explorer 6.0 SP1**
- **MSDE (32 ports or less) or SQL 2000 SP2 and hotfix**
- **Domino Notes Client 5.0.10**
- **DUCS on every Domino server with Unity Subscribers**
- **MSXML3 and MSXML3 SP1**
- **Unity 4.0**

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Cisco Unity for Domino shares most of the same software components for a successful installation as Cisco Unity for Exchange. Instead of repeating the software components, we will discuss the major difference, the message store.

Lotus Domino is IBM Lotus's database and messaging product. Cisco Unity for Domino is the result of collaboration between Cisco Systems and IBM Lotus. As part of this collaboration, IBM Lotus created the Domino Unified Communication Services (DUCS) for Cisco Unity. This component enables Cisco Unity to deliver unified messaging in a Lotus Domino environment.

DUCS Overview

Domino Unified Communications Services

DUCS requires Notes/Domino version 5.0.10 or above

DUCS is required to be installed on a Domino directory server in each Domino Domain

DUCS is required to be installed on every Domino message store server where a Unity subscriber mailbox exists (Must be Windows O/S in the first release)

DUCS must be purchased directly from Lotus, Cisco DOES NOT provide

Key Benefits

- **Single, unified Domino message store**
- **Native Notes Address Book support**
- **Message notification & MWIs**
- **Native Lotus Mail Template for voice message playback/record**
- **iNotes web access to messages**

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DUCS is available through IBM Lotus and is not supplied, nor can it be purchased, from Cisco Systems. DUCS, at present, is only qualified by IBM Lotus to work on Microsoft Windows 2000. This means any Domino server housing a message store for a Unity subscriber will require Windows 2000 as its operating system.

Domino Notes 5.0.10 provides a client for mail, calendaring, and scheduling, in much the same way Microsoft Outlook does.

At present Cisco Unity for Domino will only be supported in a unified messaging configuration with Lotus Domino being installed "off box".

DUCS Core Architectural Services

DUCS Provides a Set of Key Services to Cisco Unity

- **Message Notification**
- **Message Categorization**
- **Templates and Directory Extensions**
- **Integrated Voice Player/Recorder and Voice Inbox**

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System Software for Cisco Personal Assistant

This section will discuss the software for Cisco Personal Assistant

System Software for Cisco Personal Assistant

- **Windows 2000 SP3**
- **Cisco Personal Assistant Server**
- **Cisco Personal Assistant Speech Recognition Server**
- **Cisco Personal Assistant Web Administration**
- **Cisco IP Productivity Services**

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Cisco Personal Assistant 1.3 consists of the following software: Cisco Personal Assistant Server, Cisco Personal Assistant Speech Recognition Server, and Cisco Personal Assistant Web Administration.

Cisco Personal Assistant software is installed on its own server separate from any other AVVID product. The Personal Assistant software provides the LDAP Directory lookups, rule-based call transfers and voice mail access. It allows users to synchronize personal address books with their Microsoft Exchange contact lists. This can be achieved through either the Web Administration software or through the optional IP Phone Productivity software.

The software package includes 10 user licenses and two speech recognition sessions.

The software is compatible with: Cisco CallManager 3.1, 3.2, and 3.3; Cisco Unity 2.46, 3.0, 3.1, and 4.0 for voice mail features; Microsoft Exchange 5.5 and Exchange 2000 for calendar, e-mail, and contact synchronization features.

The Cisco Personal Assistant Speech Recognition software allows verbally enabled directory lookups, and verbal voicemail and routing rule instructions. Speech Recognition Server software can be installed on the Personal Assistant server or its own server. As was discussed in the Personal Assistant Hardware section, installing the Speech Recognition Server software on its own server will enhance system performance. Speech Recognition engines are available in North American English, U.K. English, French, French Canadian, and German. The limit at present is 45,000 Directory entries for accurate recognition of names.

The Cisco Personal Assistant Web Administration software is installed on the same server as Personal Assistant and allows for Web-based administration at either the Personal Assistant

server or from a client workstation. This allows clients to administer their own Personal Assistant features. The client requires either Internet Explorer 5.0 (or higher), or Netscape Navigator 4.5. The web-based Graphical User Interface (GUI) is available in English, French or German.

The IP Phone Productivity Services enhance the capabilities of the Cisco 7940 and 7960 IP phones through the use of scrolling keys for checking e-mail, voice mail, personal contact, and calendar information from the Microsoft Exchange server. Through the CalendarView feature of IP Phone Productivity software, the user can view appointments either by day or week on the IP phone display.

The MailView features allow access to e-mail and Cisco Unity voice messages. Users can scroll through and read e-mail messages on the IP phone display. They can also listen to and delete voice mail messages using the IP phone softkeys.

IP Phone Productivity Services allows users to activate or deactivate their routing rule-sets directly from the IP phone, as well as synchronize their personal address book with their Microsoft Exchange contacts list.

The IP Phone Productivity Services software is installed on its own server and requires IIS 4.0 or higher

Client Software for Cisco Unity for Exchange

This section discusses the client software for Unity for Exchange.

Unified Architecture—Client View With Exchange Message Store
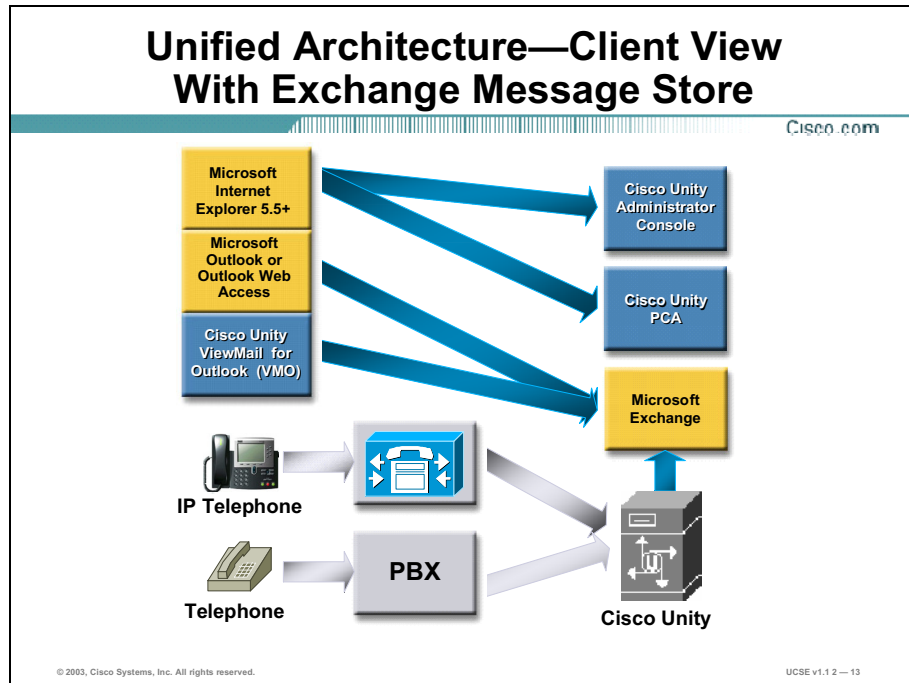
So far we have been discussing the software required on the Cisco Unity server. We now turn our attention to the client or "end-user" workstation.

Cisco Unity ViewMail for Outlook (VMO) is a special form in Outlook that has a set of control buttons. With these controls and the toolbar of buttons on the form, you can listen to, send, reply to, and forward voice messages. VMO can be used with Outlook 98, Outlook 2000, and Outlook XP. VMO cannot be used with Outlook Express or Outlook Web Access because these clients do not support Outlook forms.

VMO software can be found on the Cisco Unity Installation disc 1 in the ViewMail folder, and is installed on the client workstations, not the Cisco Unity server.

Clients may also want to access their mailbox settings through the Cisco Personal Communications Assistant (CPCA). CPCA allows the user to change their mailbox settings through a user-friendly graphical user interface, rather than over the phone. Any mailbox setting available through the telephone is available through CPCA. Class of Service in Cisco Unity controls access to CPCA. Additionally the client workstation must be running Internet Explorer 5.5 or above.

Site administrators of Cisco Unity can also access the Cisco Unity Administration screens through their desktop. Cisco Unity Class of Service controls access to this feature and the client must have Internet Explorer 5.5 or above on their workstation.

Client Software for Cisco Unity for Domino

This section discusses the client software for Cisco Unity for Domino.
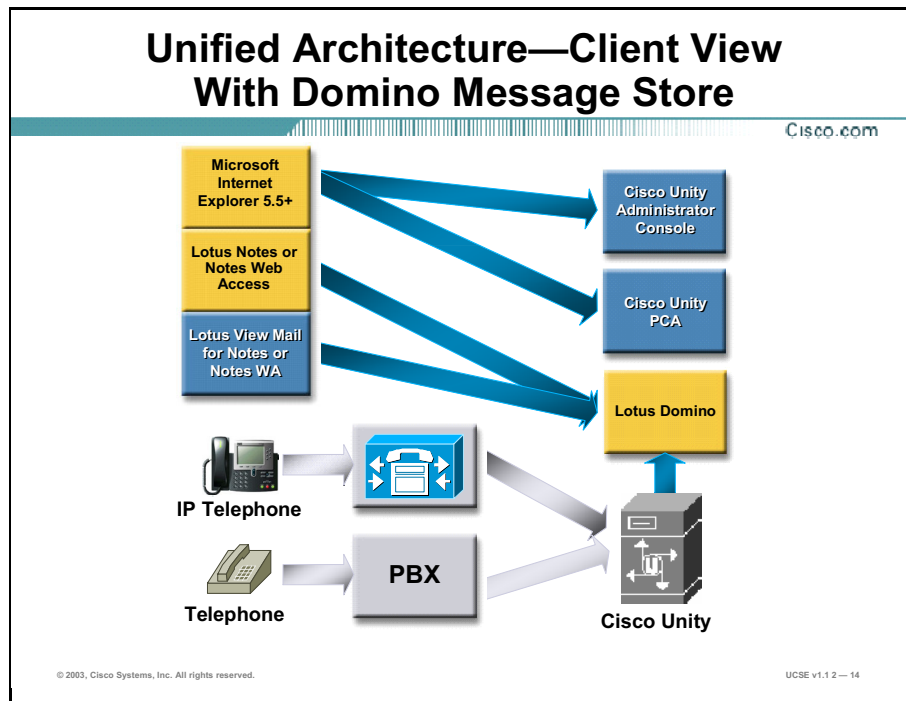
The client software supported on the Cisco Unity for Domino configuration is very similar to that of the Exchange configuration. In this case instead of Outlook being installed, we have the Domino Notes client. At this point in time, only Notes 5.0.11 can be installed on the client workstation.

As with ViewMail for Outlook, Lotus ViewMail for Notes gives the end user an easy graphical interface from which to check their voicemail and email, and to send, reply or forward either type of messages. The Lotus ViewMail for Notes client software is a Notes Mail form built and supported by IBM Lotus.

Class of Service controls access to CPCA features and the Cisco Unity Administration screens and requires Internet Explorer 5.5 or above to function.

Summary

This section summarizes the key points discussed in this lesson.

Summary

Upon completion of this lesson, you should be able to perform the following tasks:

- Describe the software required to install Cisco Unity for Exchange
- Describe the software required to install Cisco Unity for Domino
- Describe the software required to install Cisco Personal Assistant
- Describe the client software for both Cisco Unity for Exchange and Domino

UCSE v1.1 2 — 15

Next Steps

After completing this lesson, go to:

- Installing Cisco Unified Communications Software

References

For additional information, refer to these resources:

- *Cisco Unity Installation Guide (with Lotus Domino), Release 4.0(1)*

- *Cisco Unity Installation Guide (with Microsoft Exchange), Release 4.0(1)*

- *Cisco Unity System Administration Guide (with Lotus Domino), Release 4.0*

- *Cisco Unity System Administration Guide (with Microsoft Exchange), Release 4.0*

Installing Cisco Unified Communications Software

Lesson Overview

In this lesson we will discuss the installation of the Cisco Unity software in its various forms. We will look at the installation of the Cisco Unity software for Exchange and Domino, and the Personal Assistant software.

Importance

Understanding the installation process of the software will help in a successful installation of the Cisco Unity system and Personal Assistant. This is particularly important as the installation process for Cisco Unity 4.0 differs from previous versions.

Objective

Upon completing this lesson, you will be able to:

- Correctly install Cisco unified messaging software

- Correctly install Cisco Personal Assistant software

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

■ An understanding of the concepts presented in the Cisco Unified Communications Architecture section

Outline

This lesson includes these sections:

■ Using the Cisco Unity System Preparation Assistant (CUSPA)

■ Using the Cisco Unity Installation and Configuration Assistant (CUICA)

■ Using the Permissions Wizard

■ Using the Install License File Wizard

■ Cisco Unity System Setup

■ Using the Service Configuration Wizard

■ Using the Message Store Configuration Wizard

■ Unity Telephone Integration Manager

■ Tools to Guide the Installation

■ Summary

Using Cisco Unity System Preparation Assistant

This section discusses the Cisco Unity Preparation Assistant.

Cisco Unity System Preparation Assistant (CUSPA)

Cisco.com

- **Checks Cisco Unity Server for third-party required software**
- **Checks for required third-party Service Packs**
- **Installs required Software and Service Packs**
- **Does not check for or extend AD Schema required for Exchange 2000**

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The Cisco Unity System Preparation Assistant (CUSPA) is a tool to assist you in the preparation of a Cisco Unity system. This tool, located on the Service Pack disc, will check the Cisco Unity server for the required software and service packs. CUSPA will ask for your Cisco Unity server characteristics such as UM or VM, Failover, and number of Unity ports.

The Preparation Assistant will check for the proper levels of SQL, MSXML, Windows, NNTP, and IE. CUSPA does not check to make sure that the Active Directory Schema has been extended for an Exchange 2000 install. Extending the AD Schema is required before beginning the Cisco Unity installation in an Active Directory/Exchange 2000 environment.

Using the Unity Installation and Configuration Assistant

This section describes the Cisco Unity Installation and Configuration Assistant.

Cisco Unity Installation and Configuration Assistant (CUICA)

- **Permissions Wizard**
- **System Setup**
- **License Files**
- **Service Configuration Wizard**
- **Message Store Configuration Wizard**
- **Unity Telephone Integration Manager**

UCSE v1.1 2 — 18
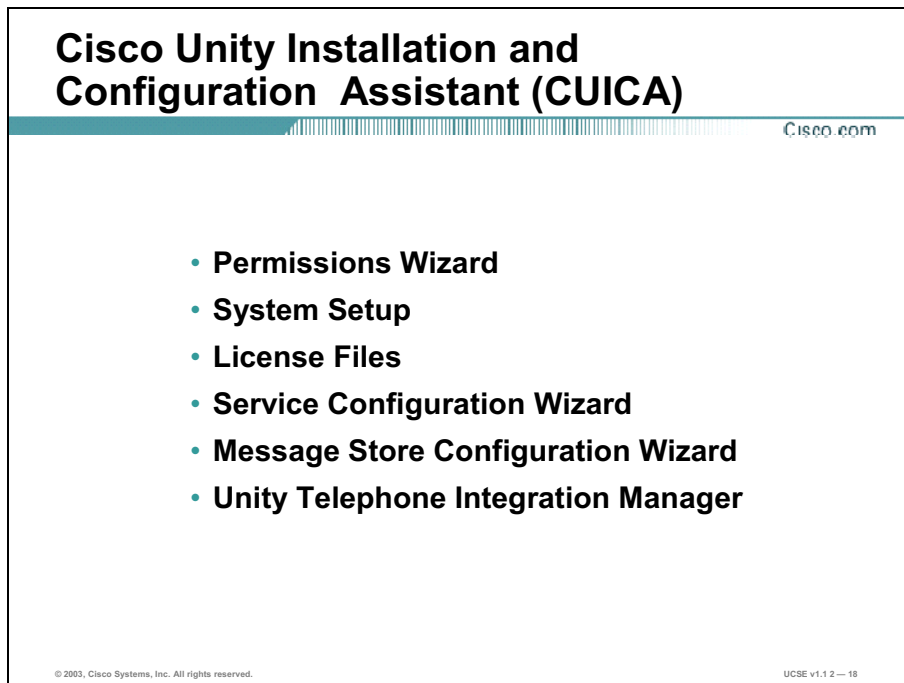
 The Cisco Unity Installation and Configuration Assistant (CUICA) replaces the two-part Cisco Unity installation introduced in version 3. The CUICA guides you through the entire setup process from setting up the correct Permissions required to install Cisco Unity to integrating Cisco Unity with the telephone system.

CUICA is actually 6 separate wizard utilities combined with the Cisco Unity Setup Program. The six wizard utilities are: Permissions Wizard, System Setup, License Files,Service Configuration, Message Store Configuration Wizard, and Unity Telephony Integration Manager (UTIM).

All but the Message Store Configuration Wizard can be run individually after Cisco Unity is installed by accessing the Tools Depot of Cisco Unity.

Permissions Wizard

This section discusses the Permissions Wizard utility.

Permissions Wizard

- **Creates accounts that will own Cisco Unity Services**
- **Creates accounts that you will use to install Cisco Unity**
- **Account rights:**
  - **Act as part of the operating system**
  - **Log on as a service**
  - **Be a member of Local Administrators**
- **Exchange and Domino permissions depend on which version and configuration-Permissions Wizard does not set these permissions**

UCSE v1.1 2 — 19

The Permissions Wizard utility sets the permissions needed to install Cisco Unity and for the Unity services to logon and run properly. This utility must be run before the Cisco Unity installation. Setting the correct permissions through the wizard will avoid complications as the Cisco Unity installation proceeds.

Before the wizard can set the correct permissions it needs to know which message store you're using; Exchange 2000, Exchange 5.5, or Domino. Depending on your configuration, the wizard will ask different questions. In general you will be asked which account should be given permissions to install and configure Unity, the account that Cisco Unity directory services will logon with, and the account to log on to message store.

After the Permissions Wizard completes there is a link to a document that explains the permissions required in an Exchange or Domino environment for Cisco Unity to be installed and function properly.

Permissions Wizard Screens

Permissions Wizard

Cisco Unity Permissions Wizard

Welcome to the Cisco Unity Permissions Wizard

This wizard helps you set permissions for the Cisco Unity installation, directory services, and message store services accounts.

Cisco Unity subscriber mailboxes will be on which message store?

○ Microsoft Exchange 5.5
● Microsoft Exchange 2000
○ Lotus Domino

Cisco **Unity**

[Back] [Next] [Cancel] [Help]

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Permissions Wizard

Cisco Unity Permissions Wizard

Choose the Windows Account to Install Cisco Unity
Which Windows account to you want to use to install Cisco Unity?

Choose the account that should be given the permissions necessary to install and configure Cisco Unity.

Installation account:

CLASSROOM1\Server2   [Change...]

[Back] [Next] [Cancel] [Help]

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Permissions Wizard

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Permissions Wizard

UCSE v1.1 2 — 23

Cisco Unity System Setup

This section describes the Cisco Unity System Setup.

Cisco Unity System Setup

Cisco.com

- **Gathers Basic System Information**
- **Language Choice**
- **Creates Default Database**
- **Loads Text to Speech and System Prompts**

UCSE v1.1 2 — 24

This part of the installation process gathers general system information for the installation process. The setup process needs this information to install the correct languages on the system, the correct text-to-speech language, and to install Unity in the correct folder and partition on the hard drive. It loads the default database consisting of the Cisco Unity Installer account, the Example Administrator account, the Example Subscriber account, the default call handlers, as well as all of the other default objects.

Install License File Wizard

This section discusses the Install License File Wizard.

Install License File Wizard

- **Add the License File to the Wizard**
- **Uses that License during Unity Installation**

UCSE v1.1 2 — 25
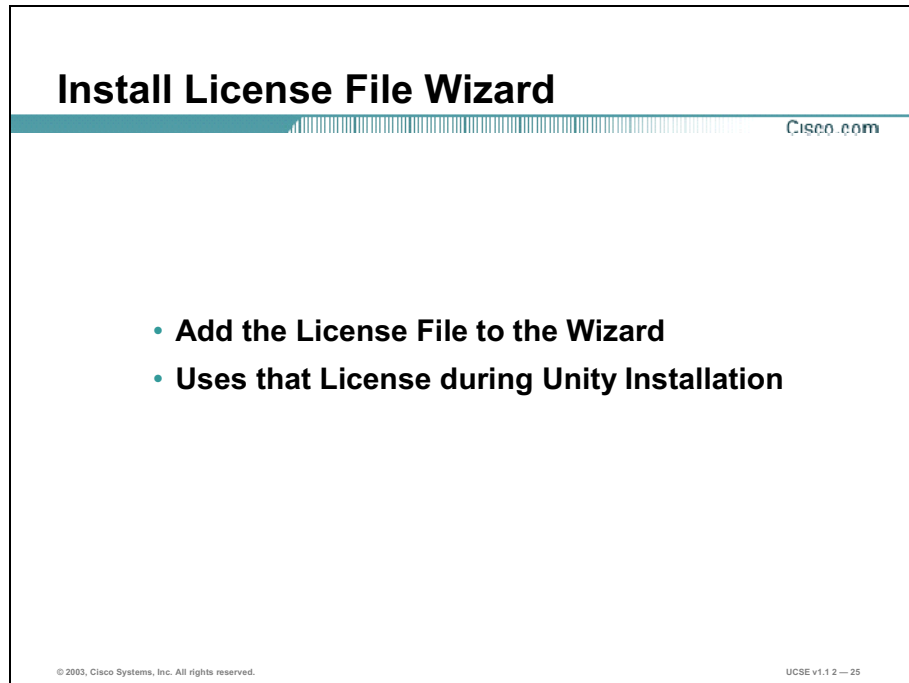
At least 24 hours before your installation of Cisco Unity you need to contact Cisco to register and obtain your Cisco Unity license file. You will need to have the MAC address (physical address) for the network interface card (NIC) in the Cisco Unity computer and the product authorization key (PAK), which is listed in the Cisco Unity Software Keys booklet that is shipped with the software discs. With that information you access the license file generator site at http://www.cisco.com/cgi-bin/Software/FormManager/ formgenerator.pl

It is not enough to simply copy license files onto the file system of the Cisco Unity server. You need to run and complete the Install License File Wizard in order for Unity to use the information in the files. You specify the names of each of your license files in the wizard. You should specify all the files you want Cisco Unity to use from that point forward, even if some of the files were installed previously. The wizard extracts the information from the files and checks the data for errors. If no errors are found, you may complete the wizard. Once you complete the wizard, Cisco Unity will begin using the license information from the files. If the wizard detects errors in the files, it will tell you what the problems are and will not permit you to proceed to the completion page. If you encounter problems, you should contact Cisco TAC.

Service Configuration Wizard

This section discusses the Service Configuration Wizard.

Service Configuration Wizard

- **Configures 3 Cisco Unity Services:**
  - **Directory Services**
  - **Message Store Services**
  - **Local Services**

UCSE v1.1 2 — 26
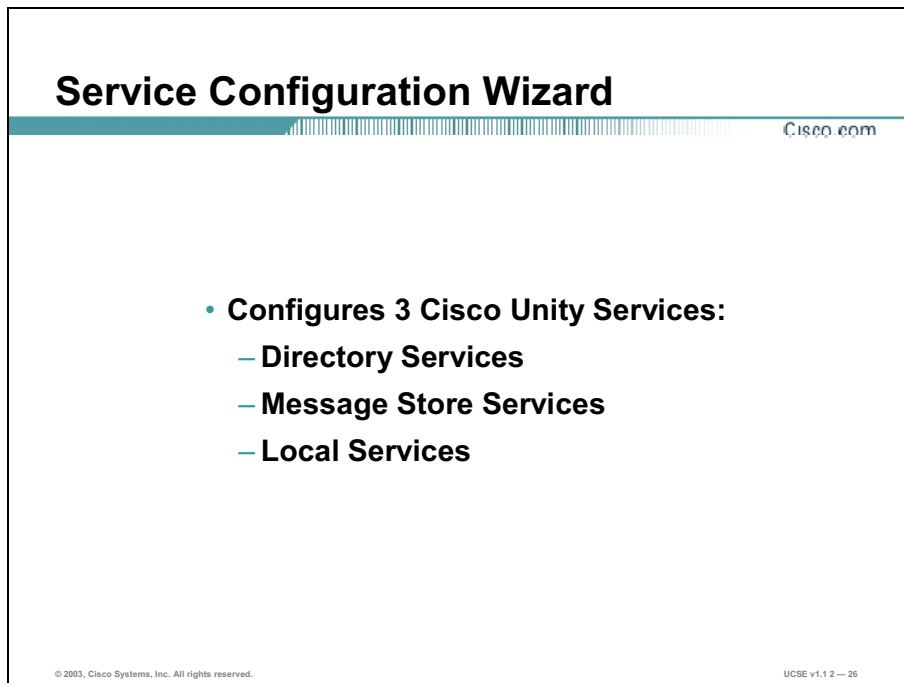
The Service Configuration Wizard helps you configure 3 groups of Cisco Unity services installed by your system. The wizard uses the selections you made during the Permissions Wizard as default accounts for the services. Since these are the accounts that have the correct permissions associated with them, it is best to accept the defaults. If you are not changing the account, you just have to put in the password for the accounts when asked. If, however, you change the accounts to use, make sure they have the proper permissions.

You will make a choice of whether you are configured for Exchange 5.5, Exchange 2000, or Lotus Domino R5. This will lead to different setup versions.

The Directory Services sets the Cisco Unity account it will use to access the Microsoft Active Directory or the Lotus Domino Database. The Message Store services need to run under an account that is allowed access to Exchange 2000 mailboxes. The Local Unity Services, in an Exchange or Domino configuration, run under an account that allows them access to registry files, the file system, and the SQL server.

Message Store Configuration Wizard

This section discusses the Message Store Configuration Wizard.

Message Store Configuration Wizard

- **Choose Message Store**
- **Choose location for new mailboxes**
- **Choose Directory Services Account**

UCSE v1.1 2 — 27
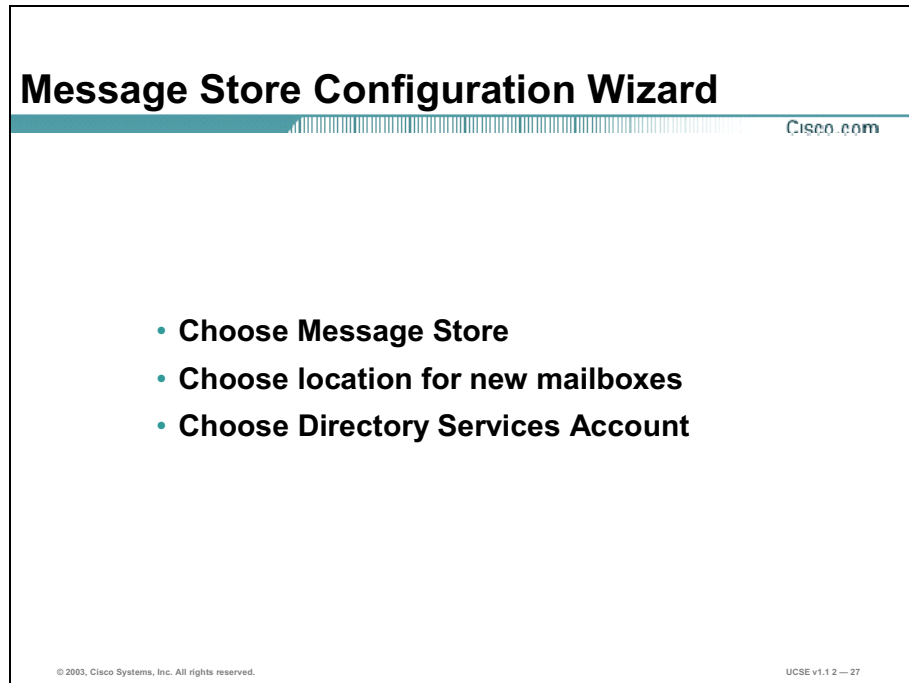
The Message Store Configuration Wizard section of the CUICA is where you choose between Exchange 5.5, Exchange 2000, or Lotus Domino R5 as your message store. You need to decide where to home new mailboxes in your message store when they are added through the Cisco Unity System Administration screens. The Directory Service account would be the same account you chose in the Cisco Service Configuration Wizard as the account that will run the Cisco Unity Directory Service which passes information back and forth between Cisco Unity and the message store.

Unity Telephone Integration Manager (UTIM)

This section covers the Unity Telephone Integration Manager.

Unity Telephone Integration Manager

Cisco.com

- **TSP for Cisco CallManager**
- **Circuit-Switched PBXes**
- **SIP (Session Initiation Protocol)**

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The Unity Telephone Integration Manager (UTIM) steps you through integrating Cisco Unity with your telephone system. Cisco Unity will support integrations for IP Telephony (Cisco CallManager), circuit-switched PBXes, and SIP. A list of supported circuit-switched PBXes, as well as integration methods will be covered in another module of the course.

If you choose TSP for Cisco Call Manager integration, you will need to have configured your Cisco CallManager to integrate with Cisco Unity before running UTIM. UTIM will ask for the Cisco CallManager IP address, the Display Name for the VoiceMail ports created, and the Message Waiting On and Off DNs. At the end of the process a test can be run to ensure the integration process was successful. Instructions on setting up Cisco CallManager to integrate with Cisco Unity can be found in the *Cisco CallManager Integration Guide*.

Session Initiation Protocol (SIP) is an important emerging Internet protocol designed to easily build up and tear down IP sessions. A number of vendors are embracing SIP as the next big Internet protocol for voice over IP. At present Cisco Unity's SIP integration will support interactions with Cisco SIP Proxy Server, as well as Cisco SIP-enabled 7960 phones, Pingtel Expressa phones, and MSN Messenger.

Tools to Guide the Installation

This section discusses the available resources for a Cisco Unity installation.

Additional Installation Resources

- **Cisco Unity 4.0 Installation Manual**
- **Cisco CallManager Integration Guide**
- **Various Circuit-Switched PBX Integration Guides**
- **Read Me files on Cisco Unity Installation Configuration Assistant (CUICA)**

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A copy of *Cisco Unity Installation Guide, Release 4.0(1)* is shipped with each Cisco Unity system. The installation manual contains information on installing the Cisco Unity system as a baseline (server purchased from Cisco), and as a component system (server supplied by the customer). In addition, there are instructions for upgrading earlier versions of Cisco Unity to version 4.0.

If you are integrating Cisco Unity with Cisco CallManager, the *CallManager Integration 3.XX Guides* are extremely helpful. There are different versions of the guides depending on your version of Cisco CallManager. Included are instructions for setting up your CallManager to integrate with Cisco Unity, as well as instructions for setting up dual switch integration.

There are also various Integration Guides for supported circuit-switched telephone systems. These cover the programming on the circuit based telephone systems necessary to integrate to Cisco Unity.

These documents are available at
http://www.cisco.com/univercd/cc/td/doc/product/voice/c_unity/index.htm

The Cisco Installation Configuration Assistant (CUICA) which is the installation assistant contains Read Me files to help guide you through the installation.

Summary

This section summarizes the key points discussed in this lesson.

Summary

Cisco.com

Upon completion of this lesson, you should be able to perform the following tasks:

- **Describe the resources available to assist with the Cisco Unity Installation**
- **Describe the use of the Cisco Unity Preparation Assistant**
- **Describe the use of the Cisco Unity Installation and Configuration Assistant and it's components**
- **Properly Install a Cisco Unity System**

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Next Steps

After completing this lesson, go to:

- Upgrading Cisco Unified Communications Software

References

For additional information, refer to these resources:

- *Cisco Unity Installation Guide (with Lotus Domino), Release 4.0(1)*

- *Cisco Unity Installation Guide (with Microsoft Exchange), Release 4.0(1)*

- *Cisco CallManager Integration Guide*

Upgrading Cisco Unified Communications Software

Lesson Overview

In this lesson we discuss the available upgrade paths and the steps involved in upgrading a previous version of Cisco Unity to Cisco Unity 4.0. We will also discuss the upgrade procedure from an earlier version of Cisco Personal Assistant to Personal Assistant 1.3.

Importance

Understanding the supported upgrades and the upgrade process will aid in the successful completion of a Cisco Unity upgrade. Some upgrades are complex, and not all upgrades from previous versions of Cisco Unity to Cisco Unity 4.0 are supported. Understanding this will avoid possible misunderstandings with your customer, and issues arising during the upgrade process.

Objective

Upon completing this lesson, you will be able to:

■ Correctly identify which upgrades from previous versions of Cisco Unity to Cisco Unity 4.0 are supported.

■ Correctly identify which upgrades to Cisco Personal Assistant 1.3 are supported.

■ Describe the steps necessary to upgrade to Cisco Unity 4.0

■ Describe the steps necessary to upgrade to Personal Assistant 1.3.

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

- An understanding of previous and current versions of Cisco Unity

- Knowledge of Microsoft Exchange and /or Lotus Domino

Outline

This lesson includes these sections:

- What Upgrades are Possible to Cisco Unity 4.0?

- What Upgrades are Available with Personal Assistant

- How to Upgrade to Cisco Unity 4.0 from Cisco Unity 3.XX

- How to Upgrade to Cisco Unity 4.0 UM (Domino) from Cisco Unity 3VM (Exchange)

- How to Upgrade to Personal Assistant 1.3 from Personal Assistant 1.2

- Summary

What Upgrades are Possible with Cisco Unity 4.0?

In this section we discuss the possible upgrades to Cisco Unity 4.0.

Supported Upgrades to Cisco Unity 4.0 for Exchange

Cisco.com

- **Cisco Unity 3.0(1-3)**
- **Cisco Unity 3.1(X)**
- **Cisco Unity 2.4(5-6)**
  - **Unity Reinstallation**

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The upgrade to Cisco Unity 4.0 will be supported from previous versions of Cisco Unity as outlined in the slide. However, versions of Cisco Unity prior to 3.0 will require a reinstallation of Cisco Unity including re-entering of the database. Versions prior to Cisco Unity 3.0 stored database attributes in Exchange's custom attributes 12 through 15 because the Exchange Directory Service was not extensible. With the release of Cisco Unity 3.0, Microsoft SQL or MSDE became the main database store. It is not possible to move the attributes from Exchange to SQL without reinstalling the database.

The procedures for performing the supported upgrades are discussed later in the lesson.

What Upgrades are Supported with Personal Assistant

This section discusses the supported upgrades possible for Personal Assistant.

Supported Upgrades to Personal Assistant 1.3

- **Personal Assistant 1.1**
- **Personal Assistant 1.2**

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Upgrades from both existing versions of Personal Assistant are supported.

How to Upgrade to Cisco Unity 4.0 for Exchange from Cisco Unity 3.X

This section discusses the upgrade procedure for upgrading to Cisco Unity 4.0 Exchange from Cisco Unity 3.X.

Upgrading to Cisco Unity 4.0 for Exchange

- **Obtain new License File**
- **Verify Exchange 2000 SP2**
- **Run AD Schema Extension on DC**
- **Use Cisco Unity System Preparation Assistant**
- **Use Cisco Unity Installation and Configuration Assistant**

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The upgrade procedure from Cisco Unity 3.X to Cisco Unity for Exchange 4.0 is outlined in the slide. It is necessary to obtain a new License file from Cisco, as the upgrade procedure itself will not upgrade the license file as it has in the past.

You should also ensure that Exchange 2000 SP2 has been installed. The Cisco Unity System Preparation Assistant does not check for the Exchange version, however the Cisco Unity Installation and Configuration Assistant will, and the Cisco Unity installation will fail if it does not find the correct version.

There have been changes to the AD Schema Extension utility that is run on the Domain Controller to extend the Active Directory schema for Cisco Unity. There is a new option in the AD Schema Extension utility for extending the schema for the VPIM option and the schema extension utility will need to be run for that option to function properly.

The Cisco Unity Installation and Configuration Assistant will need to be run to load the new Cisco Unity 4.0 files. During this process there will be no database loss.

How to Upgrade to Cisco Unity 4.0 Domino from Unity 3.XX Exchange

This section discusses the upgrade to Cisco Unity 4.0 Domino from Unity 3.XX Exchange.

Cisco Unity 4.0 for Domino from Cisco Unity 3.XX Exchange

Cisco.com

- **A new install**
- **No database is bought over**
- **Export subscriber database from Exchange**
- **Modify subscriber database into an acceptable form for Domino**
- **Import subscriber database into Domino**
- **Import subscriber database into Cisco Unity 4.0**
- **No messages**
- **Supported by TAC and documented**

UCSE v1.1 2 — 35

There may be circumstances when you will need to upgrade from Cisco Unity for Exchange to Cisco Unity for Domino. Customers in a Domino environment may have purchased Cisco Unity in a VoiceMail only configuration awaiting the Cisco Unity Domino release. Cisco Unity VoiceMail only configuration is only supported in the Exchange environment.

Although the upgrade procedure for Cisco Unity 4.0 for Domino from Cisco 3.XX Exchange is supported and documented, you must keep in mind this is basically a reinstallation. There is no way to carry over the database from one to the other because you have two completely different messaging systems. If you would like to save the subscriber database, you must export the subscriber database from Exchange, modify the subscriber database to a form acceptable to Domino, import it into Domino, and then import the subscribers from the Domino server into Cisco Unity 4.0. The information that will be exportable includes the subscribers' names and extensions, but not the spoken name recordings, greetings, etc. Subscribers' messages will not be brought over. Cisco does not offer a utility to accomplish this.

Other Cisco Unity database information such as call handlers, call routing tables, and restriction tables are also not bought over.

How to Upgrade to Personal Assistant 1.3 from Personal Assistant 1.2

This section discusses the upgrade from Personal Assistant 1.2 to Personal Assistant 1.3.

Upgrading to Personal Assistant 1.3

- **Latest release is 1.3(4)**
- **Upgrade to 1.3(1) first**
- **Install patch for 1.3(4)**
- **CD Install**
- **No reprogramming necessary**

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The Cisco Personal Assistant upgrade procedure is very straightforward. The upgrade process automatically shuts down the Personal Assistant services and restarts them after the upgrade is complete. There should be no need to reprogram the database.

The latest Personal Assistant software release is 1.3(3), however this is only a patch release and not the full program. If you are upgrading from Personal Assistant version 1.2, you must first upgrade to version 1.3 (1), then apply the patch for version 1.3(3).

Detailed instructions for upgrading Cisco Personal Assistant can be found in the *Cisco Personal Assistant Administration Guide*.

Summary

This section summarizes the key points discussed in this lesson.

Summary

Upon completion of this lesson, you should be able to perform the following tasks:

- **List the supported upgrades for Cisco Unity**
- **List the supported upgrades for Cisco Personal Assistant**
- **Describe the upgrade procedure for Cisco Unity**
- **Describe the upgrade procedure for Cisco Personal Assistant**
- **Identify where to find additional help and information**

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Next Steps

After completing this lesson, go to:

- Installing Cisco Unity Lab

References

For additional information, refer to these resources:

- *Cisco Unity Installation Guide (with Lotus Domino), Release 4.0(1)*

- *Cisco Unity Installation Guide (with Microsoft Exchange), Release 4.0(1)*

- *Cisco Personal Assistant Administration Guide*

Cisco Unified Communications Integrations

Module Overview

This module discusses the communication between a Cisco unified communications server and a telephone system. We discuss the integration between Cisco Unity, Cisco CallManager, and circuit-switched PBXes, and between Cisco CallManager and Personal Assistant.

Upon completing this module, you will be able to:

- Describe the integration of Cisco's various unified communications systems with particular telephone switches

Outline

The module contains these lessons:

- Attributes of Unified Communications Integrations

- Available Unified Communications Integrations

- Personal Assistant Integration with Cisco CallManager

Attributes of Unified Communications Integrations

Lesson Overview

This lesson discusses the attributes of unified communications integrations. You will learn the attributes of a communications integration between Cisco Unity and a telephone system, as well as between Cisco Personal Assistant and Cisco CallManager.

Importance

Understanding the attributes of a communications integration aids in installation and analyzing integration issues that may arise. In many instances technicians troubleshoot the Cisco Unity server when in fact the issue may lie with the telephone system. The knowledge gained from this lesson can save valuable time when troubleshooting integration issues.

Objectives

Upon completing this lesson, you will be able to:

- Describe the attributes of a unified communications integration

- Describe a communications integration between Cisco Unity and a telephone system

- Describe the attributes of a Personal Assistant and CallManager integration

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

■ General knowledge of telephone systems and particular knowledge of at least one telephone system

Outline

This lesson includes these sections:

■ Overview

■ What is a Communications Integration?

■ Attributes of a Cisco Unity/PBX Integration

■ Attributes of a Personal Assistant/Cisco CallManager Integration

■ Summary

What is a Communications Integration?

This section discusses the basic attributes of an integration.

Attributes of an Integration

• **Call Forward to Personal Greeting**
• **Easy Message Access**
• **Message Waiting Indication**
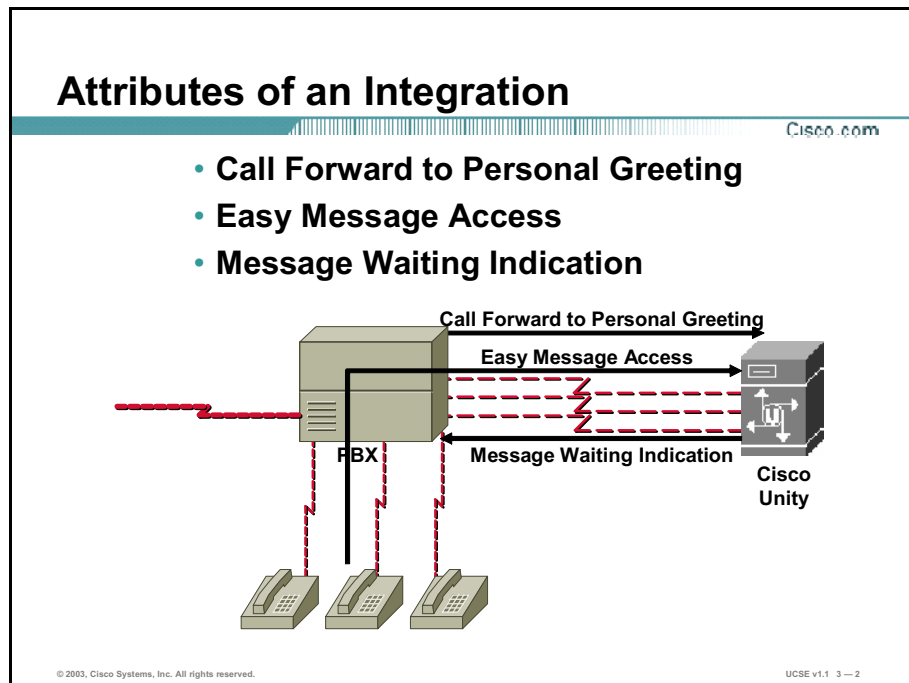
A telephone switch and a voice processing system communicate with one another via an integration. An integration between Cisco Unity and a PBX takes place when three essential features are present. Those features are:

■ Call forward to a personal greeting

■ Easy message access

■ Message waiting indicators

These features are present when the PBX and the voice messaging system are exchanging information with each other in an agreed upon manner. How the information is transferred between the two systems varies from integration to integration.

The basic integration types are: IP-based, In-band DTMF, SMDI, PBXLink, and SIP. Cisco messaging systems currently integrate with telephone systems that make up approximately 70% of the business telephone market. Once an integration is made, the PBX and the voice mail system work together, sharing information regarding call routing and message notification.

■ Call Forward to Personal Greeting - This first feature is essential to the working of voice mail. Call Forward to Personal Greeting is the way that the telephone system tells Cisco Unity what greeting to play. For a call to be routed to the correct greeting, information must be sent from the PBX along with a call to instruct Cisco Unity about what to do with a call. Our integration packages enable information regarding station identification to be sent to

Cisco Unity, which then plays the appropriate greeting. If this information were not present, the caller would hear the Opening Greeting again.

The different integrations perform in various ways:

— An IP integration sends all TAPI information as packets on the network cabling of the servers.

— In-band integration requires DTMF station identification (audio tones) for caller ID.

— An SMDI integration passes information along in a small packet of data sent via a serial cable or over a combination of modems and phone lines (Centrex).

— PBXLink integrations must have special digital lines installed that will transmit this information.

— SIP integrations send all call setup, control and breakdown information as text-based packets on the network cabling connecting the devices at each end of the session.

■ Easy Message Access - Cisco Unity recognizes a subscriber when they enter a one or two button code on their extension, without them having to enter their Personal ID. In any integration the recognition is accomplished because the telephone system has been programmed to download the digits of a subscriber's Personal ID in response to that particular key sequence. You press one or two keys at your extension, for instance "72", or you may press a button labeled "VM" or "messages" on your telephone, and the telephone switch transfers the call to the hunt group for the voice mail and sends along the digits for a Personal ID, like "*1408." The next thing you hear in the conversation is either a request for your password or the beginning of the subscriber conversation. With this feature present it is a very good idea for subscribers to password protect their voice mailbox.

■ Message Waiting Indicators - The third feature that defines an integration is Cisco Unity's ability to send codes to the PBX to activate and deactivate message-waiting indicators (MWI). That indication will take different forms depending on the telephone switch and the telephone sets attached to it. They can be a steadily lit or flashing light, a word on an LCD panel, or a special tone heard when the handset is picked up.

Attributes of a Cisco Unity and PBX integration

This section discusses the flow of information between Cisco Unity and CallManager.
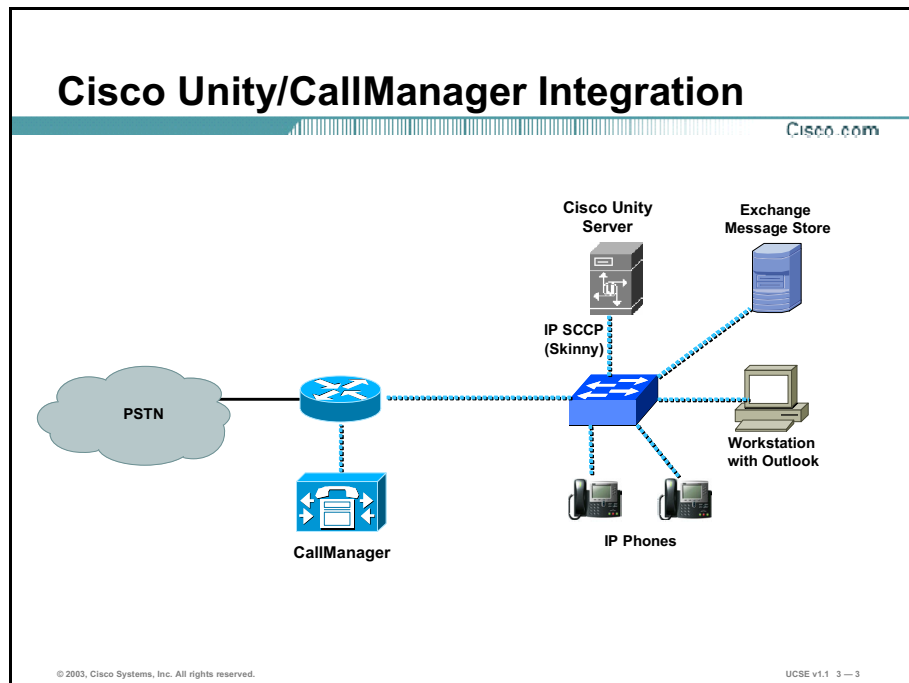
With the introduction of computer-based telephone switches that communicate via an Ethernet connection, voice mail systems are challenged to integrate using a new method. Most IP-based telephone switches use TAPI (Telephony Application Programming Interface) to communicate with third party devices (like voice mail systems). In designing Cisco Unity, Cisco decided to use TAPI as the communications protocol between all voice boards and itself. As a result, integration of the IP-based switch from Cisco is a straightforward matter. Because the switch and voice mail are on separate servers, each server must know the other's IP address so they can communicate across the network.

There are many ways CCM and Cisco Unity can be configured, depending on the customer's requirements and the site's existing network topology.

The issues involved are mostly focused around WAN deployments. Most LAN deployments are very flexible since there are fewer bandwidth constraints. It is important to understand how all the components interact in order to determine what works best for the customer.

Attributes of Personal Assistant and Cisco CallManager Integration

This section discusses the transfer of information between Personal Assistant and Cisco CallManager.
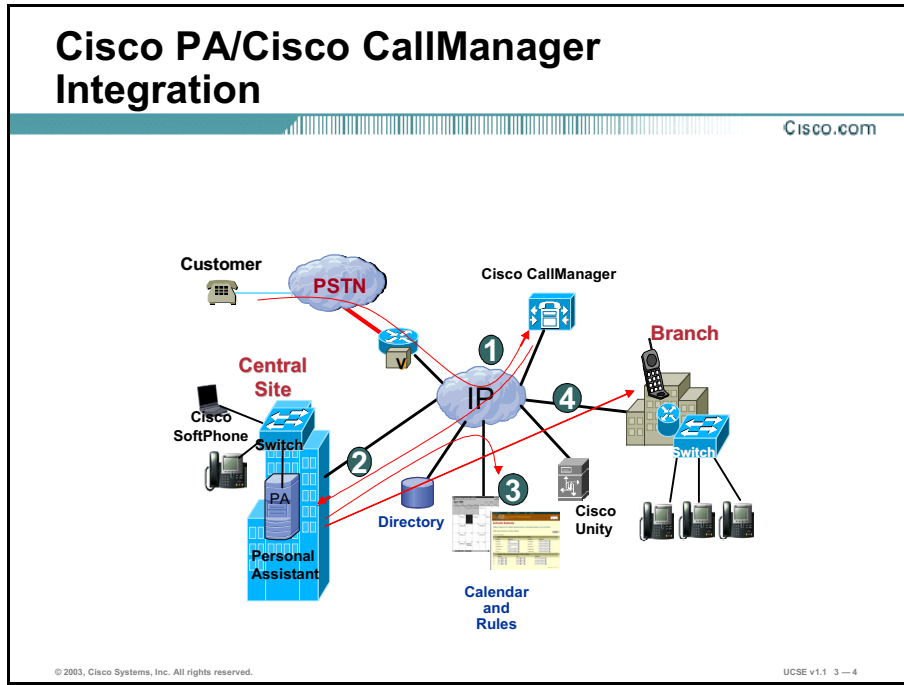
The information that passes between the Cisco Personal Assistant and Cisco CallManager is basically call information carried as IP packets over the company's LAN. The Personal Assistant uses interceptor ports to identify the telephone extensions that Personal Assistant will intercept from Cisco CallManager. These ports are configured as CTI route points and translation patterns identify them in the Personal Assistant server configuration. The route point's configuration allows Personal Assistant to intercept the call; the translation patterns allow calls to go through to the extension if the Personal Assistant server is unavailable.

In the above example a call arrives for an extension from the PSTN (Step1). Since this extension has a Persona Assistant interceptor port (CTI route point) configured for it, Cisco CallManager routes the call to Personal Assistant (Step 2). Personal Assistant retrieves user information from the LDAP directory and checks if the user has any rules set (Step 3). In our example the user set a rule to have calls sent to a branch office where he's working (Step 4).

Summary

This section summarizes the key points discussed in this lesson.

Summary

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Upon completion of this lesson, you should be able to perform the following tasks:

- **Describe the attributes of a communications integration**
- **Describe the integration between Cisco Unity and Cisco CallManager**
- **Describe the integration between Cisco Personal Assistant and Cisco CallManager**

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Next Steps

After completing this lesson, go to:

- Available Unified Communications Integrations

References

For additional information refer to these resources:

- *Cisco CallManager Integration Guide*

- *Cisco Personal Assistant Administration Guide*

Cisco Unified Communications System Engineer (UCSE) v1.1

Available Unified Communications Integrations

Lesson Overview

This lesson discusses the supported telephone integrations for Cisco Unity 4.0. We discuss examples of IP, DTMF, SMDI, PBXLink, and SIP integration.

Importance

A Cisco Unity system uses the services of a telephone switch, either circuit-switched or packet-switched, to perform its essential functions. Those functions; automated attendant, voice mail and audiotext, work because of an established relationship with a telephone switch. In this lesson you study the relationship between a telephone switch and a Cisco Unity voice processing system. An understanding of integrations assists in the proper installation and troubleshooting of Cisco Unity.

Objectives

Upon completing this lesson, you will be able to:

■ Describe the integrations supported by Cisco Unity

■ Describe how the integrations function

■ List the supported telephone systems for Cisco Unity

■ Describe what a messaging port in Unity is

■ List available message port options and their function

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

■ General knowledge of corporate messaging systems and telephone system equipment and particular knowledge of at least one PBX.

Outline

This lesson includes these sections:

■ Overview

■ How Does an IP Integration Work?

■ How Does a DTMF Integration Work?

■ How Does a SMDI Integration Work?

■ How Does a PBXLink Integration Work?

■ How Does SIP Integration Work?

■ Dual Switch Integration

■ Which Telephone Switches Does Cisco Unity Integrate With?

■ What is a Port in a Messaging System?

■ Port Configuration Options

■ Guidelines for Choosing Port Configurations

■ Summary

How does an IP Integration Work?

This section discusses a Cisco Unity and Cisco CallManager integration.
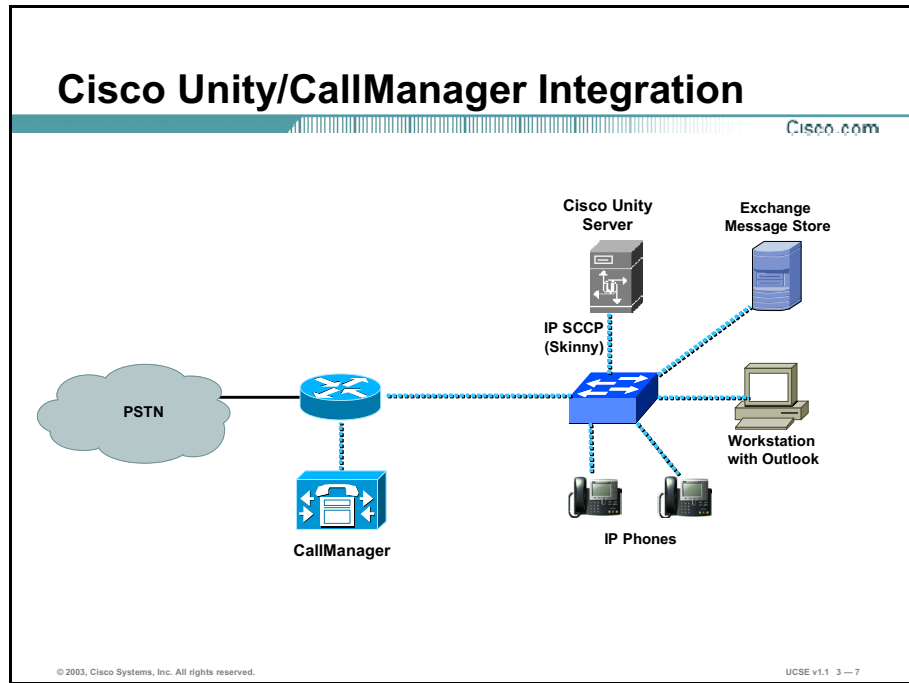
Cisco Unity messaging systems integrate with Cisco CallManager (CCM) using the Cisco Unity-CM TAPI service provider (TSP) in a pure IP environment. Because Cisco Unity and CCM communicate without the use of traditional voice boards, all call information—including session, signaling, and audio—is transferred as packets across the network.

Skinny Station Protocol and Cisco Unity-CM TAPI Service Provider - All Cisco IP telephones connect to virtual station ports on CCM using the Skinny Station Protocol (SSP). Cisco has developed a TSP that connects to the SSP layer of CallManager. The SSP layer is similar to the CTI layer and provides a communication channel to CallManager. All integration functionality is retained using this protocol and all TAPI session and call control is served through the Cisco Unity-CM TSP and SSP.

Cisco Unity 4.0 uses the Skinny Station Protocol to provide the call session and signaling information between CCM and itself. This bi-directional communication between Cisco Unity and Cisco CallManager takes place via Cisco Unity-CM TSP, a piece of software that opens and maintains that communication channel. The TSP in installed by the Unity Telephone Integration Manager.

How Does a DTMF Integration Work?

This section discusses a DTMF integration with Cisco Unity.
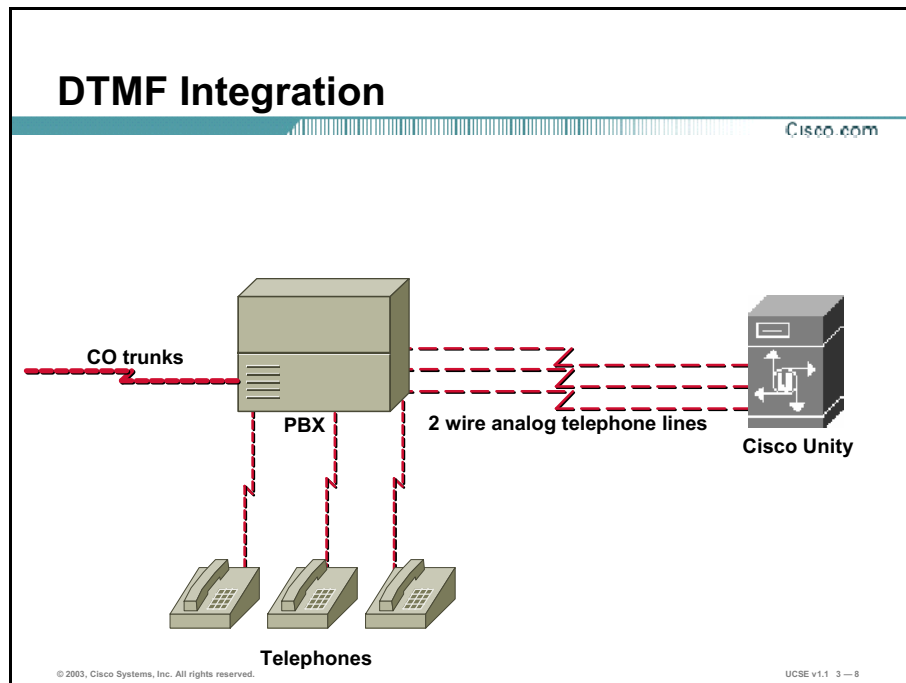
A telephone switch (PBX) using a DTMF integration sends a series of DTMF tones to the voice processing system that communicate information needed for Call forward to personal greeting and Easy message access. The voice processing system in turn sends DTMF tones to the telephone switch to tell it to turn MWI on or off.

When a call initially comes in to Cisco Unity and the caller enters an extension, the system puts the caller on hold and dials the extension listed in the subscriber's page for the extension ID listed. Once the caller is on hold, Cisco Unity outpulses the extension and then either waits on the line listening for ringing (Supervise transfer) or releasing the call (Release to switch). If the call goes unanswered for the specified number of rings (either in Cisco Unity's or the PBX's programming, dependent on the transfer type used), the call comes back to Cisco Unity. In the case of a supervised transfer, Cisco Unity still has control of the call, so it sends the call directly to the personal greeting. In the case of a Release transfer, the Cisco Unity answers as if it is a new incoming call and the PBX pulses out in touchtones the call forwarding digits needed by Cisco Unity to play the correct subscriber's personal greeting.

How Does an SMDI Integration Work?

This section discusses SMDI integration.
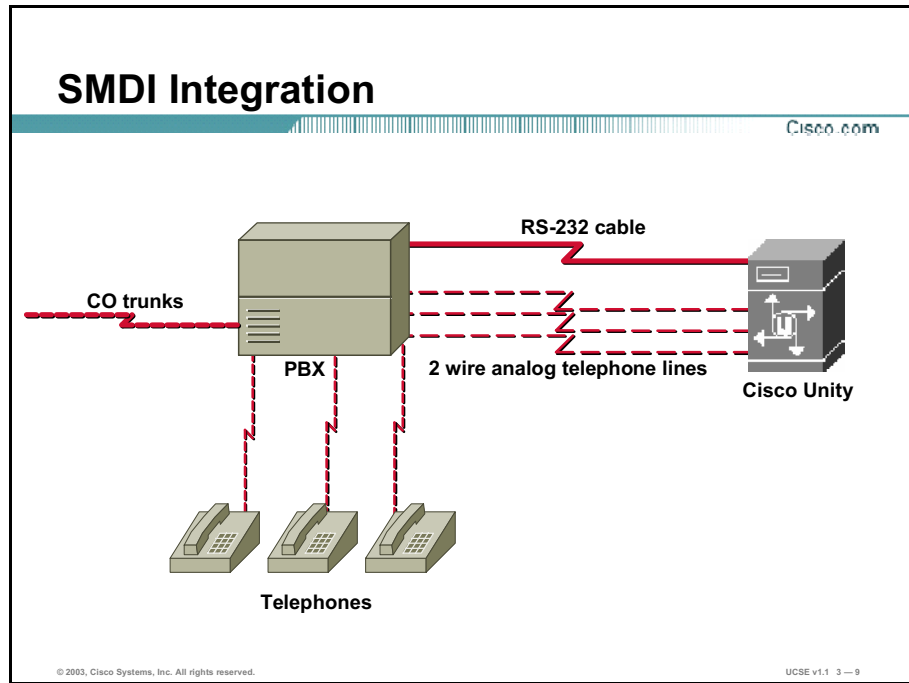
A Simplified Message Desk Interface (SMDI) integration usually uses an RS-232 cable to connect the voice mail and telephone switch. The serial cable plugs into the voice processing system on one end and the telephone switch on the other end. This is also known as "out of band" signaling because the information about the call is carried on a different channel than the voice traffic. In contrast, an in-band (DTMF) solution carries the information about the call on the same port that carries the voice traffic.

SMDI integrations using a serial cable have a 100 foot connection limit determined by the technical specifications of the RS-232 standard. If you are using Centrex lines, where the central office serves, in effect, as an off-site PBX, a dedicated line connected by modems at each end allows you to bypass the 100-foot limit. The serial packets sent are sometimes referred to as SMDI packets. This is the standard protocol used by Centrex, but also used by the NEC 2000 and the NEC 2400 among others

A serial integration is more difficult to configure because of the variables involved: switch programming, cable configurations and COM port configurations. Once it has been set up, it is both extremely reliable and quicker than a DTMF integration, particularly in the area of servicing MWI requests.

How Does a PBXLink Integration Work?

This section discusses a PBXLink integration.
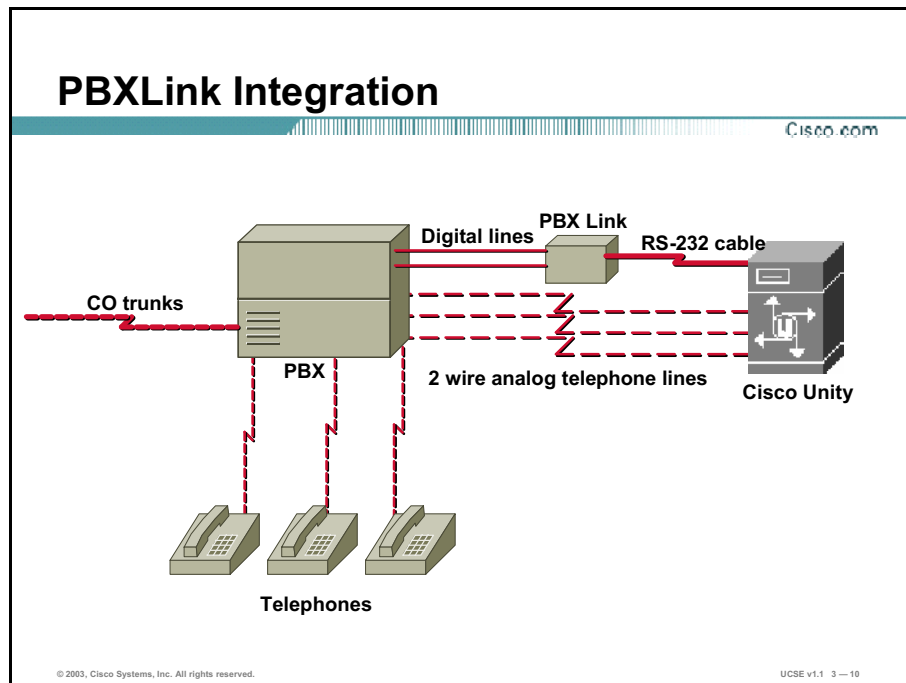
The PBXLink box provides an integration solution for several telephone switches, among them the Avaya Definity Gx and the Nortel Meridian-1. The PBXLink box works in conjunction with the voice board(s) inside Cisco Unity. The voice boards used in the integration are the standard boards available for Cisco Unity systems. Which boards are used will be based on a configuration that makes most efficient use of slots in the server.

The voice board(s) used with the PBXLink use PCI slots. The PBXLink is connected to the telephone switch using digital lines. Analog lines connect the PBX to the voice boards, which together provide a channel for all the voice and DTMF traffic. The integration information is sent to Cisco Unity via an RS-232 cable between it and the PBXLink box.

The PBXLink is attached to the PBX via digital lines and programmed through feature set keys on the corresponding digital stations. The PBXLink uses the busy indicators to determine which analog lines between the PBX and the voice mail are busy and when calls arrive at the voice mail system the PBXLink gathers the call information from the display of the digital set. The PBXLink reads the digital information about the call (called party's extension, reason for the forward, and calling party's extension on internal calls), translates that into SMDI packets and sends the information through the RS-232 cable to the voice mail. The PBXLink box sends the information about the call (for example, which personal greeting to play when a call is forwarded to voice mail on a ring no answer) across the RS-232 cable. The PBX sends the call to the voice messaging system through the analog lines connecting the voice boards and the switch.

Session Initiation Protocol (SIP)

This section discusses the Session Initiation Protocol integration.
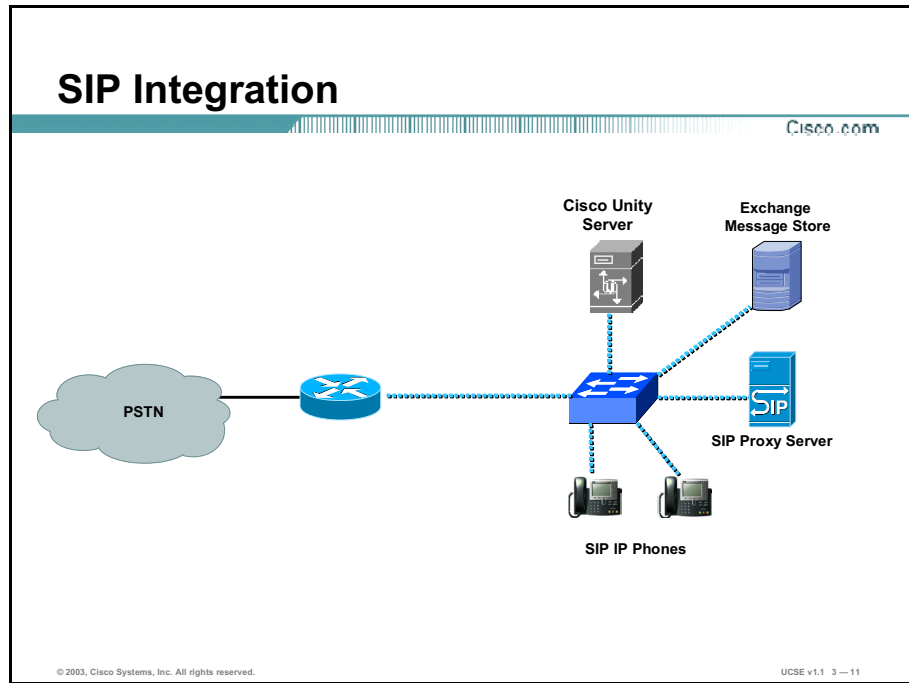
The SIP integration uses a SIP proxy server to set up communication between the voice messaging ports on the Cisco Unity server and the appropriate end point (for example, a SIP-enabled phone) . The communications occur through an IP network (LAN, WAN, or Internet) to all SIP-enabled devices connected to it, a SIP-enabled gateway to the PSTN and all phone connected to it.

The proxy server sends the following information in the SIP message with the calls forwarded:

■   In the Diversion header, the extension of the called party

■   In the Diversion header, the reason for the forwarding call

■   In the Form header, the extension of the calling party (for internal calls) or the SIP URL of the calling party (if it is an external call and the system uses caller ID).

Dual Switch Integration

This section discusses dual switch integration.
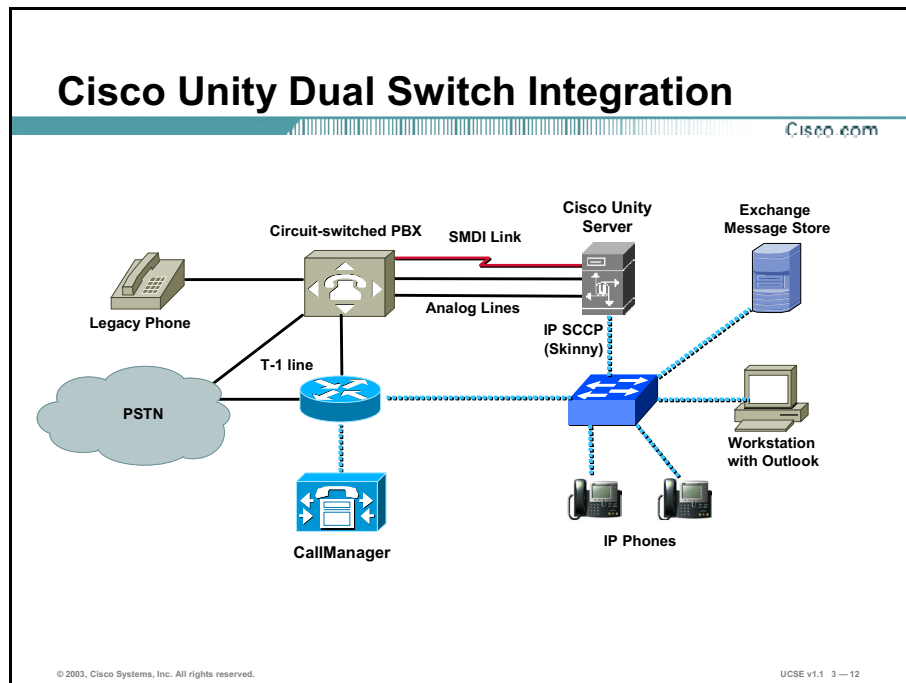
Compatibility between voice/unified messaging systems, the existing PBX equipment, and IP telephony solutions is a primary concern for most enterprises. Users must experience uninterrupted service and be offered a familiar interface in order to ensure a smooth migration from a traditional PBX system to an IP telephony environment.

Dual switch integration provides a superlative integration for customers who currently have a traditional circuit-switched PBX and would like to migrate to Cisco CallManager. This integration preserves a customer's investment in their circuit-switched infrastructure while simultaneously allowing for migration to packet-switched technology at any pace the customer chooses. This allows enterprises to operate in a hybrid environment while maintaining consistent voice messaging service across the organization.

Cisco Unity solutions are designed to provide connectivity with Cisco CallManager and existing PBX equipment at the same time. In addition to connectivity, Cisco Unity solutions also support complete voice mail integration between both systems simultaneously.

Dual Switch Integration is also available in connecting Cisco Unity CallManager and a Cisco SIP Proxy Server.

The best source for information about the Cisco Unity/CallManager integration in a dual switch environment is a book in the *Cisco CallManager Integration Guide* series. These books are available in Adobe Acrobat PDF format from several sources. They are also available from the Cisco web site at the following location:
http://www.cisco.com/univercd/cc/td/doc/product/voice/c_unity/integuid/index.htm

Requirements for the telephone systems, settings for the Cisco Unity Administrator, switch settings in CallManager and other topics are covered in the guide.

Supported Telephone Systems

This section lists the supported telephone systems for Cisco Unity.

Supported Telephone Systems

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Alcatel 4400 (DTMF)
Avaya Definity G3 (DTMF)
Avaya Definity Gx (PBXLink)
Avaya Definity ProLogix (DTMF)
Cisco CallManager 3.0,3.1,3.2,3.3 (IP)
Cisco SIP Proxy Server (SIP)
Centrex (Serial)
Ericsson MD-110 (Serial)
Intecom E14 Millenium (Serial)
Matra 6500 (DTMF)
Mitel SX-200,SX-2000 (DTMF) ONS
NEX NEAX 2000, 2400 (Serial) MCI
Nortel Meridian 1 (PBXLink)
Siemens 9751 9006i (DTMF)
Siemens Hicom 300 (DTMF)

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Listed are the currently supported telephone systems for Cisco Unity 4.0.

Cisco conducts extensive testing before qualifying a telephone system for use with Cisco Unity. They are tested under many different call scenarios and troubleshooting information is created. Therefore, Cisco TAC will not support systems not appearing on the list. If you do decide to install Cisco Unity on a non-supported telephone system you will be responsible for all integration issues on that system.

What is a Port in a Messaging System ?

This section discusses the concept of a messaging port.

Messaging Ports

Cisco.com

- **Open communications channel between Cisco Unity and Telephone system**
- **1 Port per Cisco Unity session (call)**
- **Cisco CallManager configured as Voice Mail ports**
- **Circuit-switched PBXes configured as Analog telephone extensions**

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The Cisco Unity voice mail ports are a crucial part of general setup. Ports are also referred to in many of the Cisco Unity documents as sessions. The term 'port' is from the Telephony world, when a physical connection was made between the voice mail and the telephone switch. The term session is used in the IP Telephony world.

In essence, then, a messaging port is an open communications channel between the telephone system and Cisco Unity. When Cisco Unity answers a PSTN call or a user calling to check messages, Cisco Unity uses a port. In other words then, Cisco Unity requires one port for every simultaneous telephone call you expect it to handle. Determining how many ports you require depends on your client's corporate messaging needs. Such features as Auto Attendant, Audiotext, Message Notification, and whether it is a DTMF integration all can effect the number of ports required.

In Cisco CallManager each Cisco Unity messaging port is configured as a Voice Mail port. In circuit-based PBX integrations, the Cisco Unity messaging ports are Analog extensions with one extension used per port.

Port Configuration Options

This section discusses the various settings for the messaging ports

Port Settings

- **Enabled**
- **Answer Calls**
- **Message Notification**
- **Dialout MWI**
- **TRAP Connection**

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Each Cisco Unity messaging port can be configured to one of these five settings: Enabled, Answer Calls, Message Notification, Dialout MWI, and TRAP Connection. How the individual ports on your Cisco Unity are configured will depend on your corporate messaging needs. We discuss some considerations in the next section.

First though, a definition of the various settings is necessary.

Enabled-This setting means that the port is in service. If this setting is unchecked the port is Out of Service. In that scenario the caller who reaches that port will receive ringing tones but not be answered. You might uncheck this setting if you are having issues with that particular port or extension from the telephone system and you do not want callers to access that port. You should remove that port from the hunt group you created to prevent such a scenario from happening.

Answer Calls-This setting means Cisco Unity will answer a call received on this port. This can be either a call coming in from the PSTN or an internal call coming from a subscriber's office extension number. Unchecking this setting means Cisco Unity will not accept an incoming call on this port.

Message Notification-This setting allows the Cisco Unity port to dial out calls for message notification, such as to a pager, mobile phone, text pager, etc. Dial outs are subject to Restriction Table settings as discussed in the UCSA course.

Dialout MWI-The acronym MWI stands for Message Waiting Indication, i.e. the message light on the telephone. This setting allows the Cisco Unity port to dial out the message lamp on and off codes associated with telephone systems.

TRAP Connection-The acronym TRAP stands for Telephone Record and Playback. This is used during telephone recording and playback of greetings through the Media Master in Cisco Unity. The Media Master is used when recording or playing greetings using the CPCA or through System Administration screens. Unchecking this setting for all ports would require users to use the microphone of their PC's multimedia device for record and playback.

Guidelines for Port Configuration

This sections discusses some guidelines for configuring the Cisco Unity ports

The determining factor on how to configure the Cisco Unity ports is your client's corporate messaging needs. As we have seen, Cisco Unity is feature rich and your use of these features directly impacts how the ports will be configured.

The Auto Attendant feature can effect the port configuration by requiring the Answer Calls setting to be used on all ports. To ensure callers do not receive a busy signal when calling, you would want as many ports as possible set to answer those calls.

The Message Notification feature of Cisco Unity can greatly increase the dial out usage of the ports. As you remember, every subscriber has the option of having up to 13 different message notification devices configured to notify them when they have messages in their mailbox. If a port is not available, the message notification will be queued and a user's notifications may be delayed. How long the delay is will depend on how many message notifications are queued.

If the Dial Out MWI setting is not selected on a sufficient number of Cisco Unity ports, there will be a delay on the lighting and extinguishing of message waiting on the user's telephone. This may result in complaints of delayed messages, (user's complaining there are messages in their mailboxes and lamps not being lit), or on retrieving their messages the lamp not going out. These scenarios can occur on those installations using DTMF or (to a much lesser extent) IP integrations. (Serial and PBXLink type integrations do not use Cisco Unity messaging ports to light messaging waiting lamps).

As a guide it is suggested that on DTMF integrations 25% of the Cisco Unity ports initially be set for DialOut MWI. Naturally, if issues arise, the port settings can be adjusted.

On IP integrations it is suggested to have 1 DialOut MWI port configured for every 16 ports of the Cisco Unity system. Although the Cisco Unity port is not sending out touchtones to light lamps on an IP integration, the channel still needs to be open.

TRAP can also have an effect on ports. If not enough ports are configured for TRAP, some users would receive an error such as, "Unknown problems are preventing the completion of this call:" Those users would then need to use their PC's multi-media microphone to record greetings during that session.

Summary

This section summarizes the key points discussed in this lesson.

Summary

Upon completion of this lesson, you should be able to perform the following tasks:

- **Describe the different Cisco Unity integrations**
- **Describe a Dual Switch Integration**
- **List the supported Cisco Unity Telephone Systems**
- **Define a Cisco Unity Messaging Port**
- **Describe Cisco Unity Message Port Configurations**
- **Define Guidelines for Cisco Unity Message Port settings**

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Next Steps

After completing this lesson, go to:

■ Personal Assistant Integration with CallManager

References

For additional information, refer to these resources:

■ Various Cisco Unity Integration guides

■ *Cisco CallManager Integration Guide*

■ *Cisco Unity System Administration Guide*

Personal Assistant Integration with Cisco CallManager

Overview

In this lesson you look at the programming necessary to integrate Cisco CallManager and Personal Assistant.

Importance

Understanding how to integrate Cisco CallManager and Personal Assistant will assist in the installation of a properly functioning Personal Assistant server. Understanding the Cisco CallManager programming will aid in understanding the call flow between the two systems.

Objectives

Upon completing this lesson, you will be able to:

■ Describe the Cisco CallManager programming necessary to integrate with Personal Assistant.

■ Describe the configuration setup necessary in Personal Assistant.

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

- A knowledge of Cisco CallManager partitions, calling search spaces, translation patterns, interceptor ports, media ports and route points

Outline

This lesson includes these sections:

- Overview

- Configuring Call Manager Partitions

- CallManager Calling Search Spaces

- CallManager Interceptor Ports

- CallManager Translation Patterns

- Configuring CallManager Route points

- Configuring CallManager Media Ports

- Configuring Personal Assistant Speech Services

- Configuring Personal Assistant Telephony

- Configuring Personal Assistant Messaging

- Personal Assistant Corporate Directory Settings

- Summary

Configuring CallManager Partitions

This section discusses the Cisco CallManager partitions required for Personal Assistant.

You must build partitions in Cisco CallManager to enable Personal Assistant to intercept calls. Equally important, partitions will allow those phones you do not want intercepted by Personal Assistant to function properly.

In the above example we have three partitions. The Employee partition includes all IP Phones we do not want to be intercepted by Personal Assistant. The PA partition includes all of the Personal Assistant Interceptor Ports. The PAManagedEmployee Partition includes those IP phones we want to be PA enabled, in other words intercepted by Personal Assistant.

Naturally, you can name the partitions any way you wish, but it helps if the names are descriptive of their function.

CallManager Calling Search Spaces

In this section we discuss the relationship between Cisco CallManager Calling Search Spaces and Personal Assistant.

Calling Search spaces are an ordered list of Cisco CallManager partitions. In order for calls from one extension to another to be successfully completed in Cisco CallManager, both phones must be in partitions belonging to the same Calling Search Space. So for calls to be able to be intercepted by Personal Assistant we need a Calling Search Space to include the PA partition we spoke about earlier.

In this example we see three Calling Search Spaces have been created. Only the EmployeeCSS and PACSS concern our installation of Personal Assistant. The GA-CSS is for another application this CallManager is supporting. In your installation you may have many more Calling Search Spaces than those shown here depending on your organization's telephony requirements.

Configuring CallManager Calling Search Spaces

This section gives an example of how to configure a CallManager Calling Search Space to work with Personal Assistant.

When configuring a Calling Search Space the order in which the partitions are arranged is important. Cisco CallManager will look at the partitions from the top down. So in this example the PACSS will look to the PAManagedEmployee partition first. This forces Cisco CallManager to look at extensions associated with the PAManagedEmployee partition (i.e., those you want to be intercepted by Personal Assistant) first.

The EmployeeCSS is also configured, but it has PA and Employee partitions assigned to it respectively. This allows extensions belonging to those partitions to access Personal Assistant.

CallManager Interceptor Ports

This section discusses interceptor ports required in Cisco CallManager for Personal Assistant.

Interceptor ports are actually a Personal Assistant name for Cisco CallManager's CTI route points. A CTI route point would then be created for each group of extensions you would want Personal Assistant to be PA enabled.

Interceptor ports allow Personal Assistant to "intercept" extensions covered under its configuration. In the example shown any extension in the 2XXX range will be intercepted by Personal Assistant. If Personal Assistant were unavailable, the translation pattern we discussed earlier, also set for the 2XXX extensions, would allow the calls to go directly to those extensions. You must build a corresponding translation pattern for every interceptor port built.

CallManager Translation Patterns

This section discusses the Cisco CallManager Translation pattern required for Personal Assistant.

CallManager Translation Patterns

Cisco.com

The translation pattern allows calls to go through to the extension if the Personal Assistant server is unavailable

You MUST create a translation pattern for each route point you define for Personal Assistant's use

Cisco CallManager Administration
For Cisco IP Telephony Solutions

Translation Pattern Configuration

Add a New Translation Pattern
Back to Find/List Translation Patterns

Translation Pattern: 2XXX
Status: Ready

Copy | Update | Delete | Cancel Changes

Pattern Definition
Translation Pattern: 2XXX
Partition: Employee
Numbering Plan*: North American Numbering Pla
Route Filter: < None >
Calling Search Space: PACSS
Route Option: ⦿ Route this pattern ◯ Block this pattern
☑ Provide Outside Dial Tone ☑ Urgent Priority

Calling Party Transformations
☐ Use Calling Party's External Phone Number Mask
Calling Party Transform Mask:
Prefix Digits (Outgoing Calls):

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Translation patterns in Cisco CallManager work in conjunction the interceptor ports. While an interceptor port will allow Personal Assistant to intercept a call going to an extension covered by that port, the translation pattern will allow the call to go directly to that extension should Personal Assistant be unavailable. This could happen if all the media ports assigned to Personal Assistant are busy.

Configuring Cisco CallManager Route Points

This section discusses the Cisco CallManager route point configuration for Personal Assistant.

A CTI route point is used to configure Personal Assistant's main number , that is, the number users would dial to access Personal Assistant. In telephony terms this is the hunt group pilot number.

You add a CTI route point and then assign a unique directory number (DN) on the Directory Number Configuration page of the CTI route point. This number should be something easy for the user's to remember. The DN should belong to the Employee partition and the PACSS calling search space (following our example). This allows all IP phones to call into Personal Assistant.

Only one CTI route point needs to be configured for the main number. A second CTI route point would be configured if you wanted to use the automated attendant feature of Personal Assistant. The route point used for the automated attendant feature would also be configured with a unique DN and belong to the same partition and calling search spaces.

Configuring CallManager Media Ports

This section discusses the Cisco CallManager media ports required for Personal Assistant.

Media ports are the devices that connect callers to Personal Assistant. One media port is configured for each simultaneous session of Personal Assistant required. If you want Personal Assistant to handle 20 simultaneous sessions (telephone calls), you would need to configure 20 media ports. In telephony terms, these would be the members of the hunt group.

If there are not enough media ports configured, callers will receive a busy tone when attempting to access Personal Assistant. Personal Assistant will also not intercept calls to PA enabled phones and the translation pattern will complete the call to the dialed extension.

The media ports are configured as 7960 type phone devices. It is good practice to assign the media ports DNs following the CTI route point you created for Personal Assistant's main number. In our example 2900 was used as the main number, so our 20 media ports would begin at 2901 and end at 2920.

The MAC address used for these ports, even though they are virtual phones, still need to follow the MAC addressing convention of 12 digits. You pad the DN with the required number of "9's" to reach the 12 digits required. The example media ports would have MAC addresses from 999999992901 to 999999992920.

Configuring Personal Assistant Speech Services

This section discusses the speech services configuration in Personal Assistant.

Configuring Cisco Personal Assistant Speech Services

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Enter Speech License Code

Enter Speech Server hostname or IP address

Enter License Manager hostname or IP address

Speech Services Configuration

Specify the values for the attributes and click Save.

Refresh User Information from Directory

Refresh every day at [02 ▾] : [00 ▾]
[Refresh] to read user information from the Directory immediately.

Speech License Configuration
License Code   [   ]
License Capacity Configured   96 Speech Ports

Speech Recognition Server Hosts
[   ] [Add]   172.20.73.25
             [Remove]

Speech Recognition License Manager Hosts
[   ] [Add]   172.20.73.25
             [Remove]

Speech Recognition Parameters
Max Disambiguate   [3   ]

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We now turn our attention to the configuration of Personal Assistant. The Speech Services configuration screen is where you configure which languages are available to users, the location of the speech server, and the speech license code.

The speech license code controls how many simultaneous speech recognition sessions are allowed in Personal Assistant. There are currently two types of speech licenses, one for a single language and one for multiple languages.

The Speech Recognition Server Host field is where you tell Personal Assistant the IP address or hostname of the server where your speech services have been installed. In smaller installations the speech server may also be the Personal Assistant server, in most instances it will be on a separate server for performance reasons.

The Refresh button towards the top of the page plays an important roll. Whenever changes are made to the corporate directory Personal Assistant need to learn them. You set Personal Assistant to 'refresh" automatically at a predetermined time of day, usually when the server is not busy. However if you want Personal Assistant to update immediately, you can use the "refresh' feature. Be careful, you may cause Personal Assistant to be unavailable during the refresh if you do it during normal business hours.

Configuring Personal Assistant Telephony

In this section we discuss Personal Assistant telephony configuration.

The telephony services act as the interface between Personal Assistant and Cisco CallManager. Personal Assistant requires these services to receive and transfer telephone calls.

Personal Assistant uses both JTAPI and Skinny providers. JTAPI is used for the interceptor ports and route points, and the Skinny protocol for the media ports. One JTAPI and one Skinny provider must be configured for each Cisco CallManager cluster in which Personal Assistant servers have numbers defined.

The JTAPI configuration requires you to configure a user for Personal Assistant in the corporate directory of Cisco CallManager. This user is typically named "PA". Personal Assistant uses this user to send requests into Cisco CallManager. The user name and password, as well as the providers IP address (your Cisco CallManager) are entered when configuring the JTAPI service in Personal Assistant.

The Skinny provider configuration requires only the IP address of the Cisco CallManager providing the service.

Configuring Personal Assistant Messaging

In this section we discuss the Personal Assistant Messaging Configuration.

Configuring Personal Assistant Messaging

Cisco.com

Calendaring Server Information:
- Specify Calendaring server name, and mailbox name

Paging Server Configuration:
- Specify the SMTP server name, port number, and SMTP server domain name

Voice Mail Configuration:
- Mailbox name: Unity Messaging
- Number of Unity licenses

Messaging Configuration

Specify the values for the configuration attributes and click Save.

Calendar Server Attributes
Calendar Server Name
Calendar Mailbox Name — Unity Messaging

Paging Server Attributes
Paging SMTP Server Name
Paging SMTP Server Port — 25
Paging SMTP Domain Name

Voicemail Server Attributes
Mailbox Name — Unity Messaging
Number of Unity Licenses — 2
Redirection Delay (in milliseconds) — 2000

To add a Voicemail server, set the values for the attributes and click Add server.
To modify a server, change the settings and click Update.

Voicemail Server Name (e.g: VmServer)
Pilot Number
DTMF Redirection Sequence (Internal) — #X#2
DTMF Redirection Sequence (External) — #X#2

Add Server

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Personal Assistant can provide e-mail paging, calendar-based call routing, and access to Cisco Unity. Personal Assistant integrates with Microsoft Exchange to provide calendar-based call routing and can integrate with the same Exchange server you are using for Cisco Unity.

Personal Assistant must have administrator access to Microsoft Exchange to obtain a user's calendar information. This information is used when evaluating call routing rules that include calendar-based parameters.

To access a user's mailbox account on Cisco Unity for voicemail browsing, Personal Assistant must have administrator access to Cisco Unity. Personal Assistant can integrate with more than one Cisco Unity server.

Personal Assistant Corporate Directory Settings

This section discusses the Personal Assistant corporate directory settings.

Personal Assistant's corporate directory settings are used to connect to the organization's corporate directory for Personal Assistant name dialing.

Personal Assistant can integrate with any LDAP directory. Our example shows integration with the Cisco CallManager DC directory.

The Unique User Attribute Name field is used by Personal Assistant to uniquely identify each user in the directory. When using the Cisco CallManager DC directory the value in this field will be "cn". If your client is using another LDAP capable directory, ask the administrator for the name.

The Directory Server URL is where Personal Assistant can find the corporate directory. In our example the corporate directory is located on a Cisco CallManager server identified as NYCMM.

For Personal Assistant to access the corporate directory it will need to know the directory's administrator name and password. These are entered in the Directory Admin DN and Password fields.

Clicking on the Test Filter button located on this page can check Personal Assistant's access to the corporate directory. You should see the entries in the corporate directory. If not, some values entered are incorrect.

Summary

This section summarizes the key points discussed in this lesson.

Summary

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Upon completion of this lesson, you should be able to perform the following tasks:

• **Describe the configuration steps necessary to integrate Cisco CallManager with Personal Assistant**

• **Describe the configuration required in Personal Assistant to integrate with Cisco CallManager**

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Next Steps

After completing this lesson, go to:

■ Unified Communications Networking

References

For additional information, refer to these resources:

■ *Cisco Personal Assistant Administration Guide*

Unified Communications Networking

Module Overview

Networking is one of the most powerful tools of Cisco Unity, allowing users to interact with both Cisco Unity and non-Cisco Unity recipients to send and receive email, voice mail, and faxes. Companies and organizations must be able to communicate internally and externally and networking is a tool that allows them to be connected. You will cover both basic and advanced topics of Cisco Unity/Exchange/Domino networking as you progress through the chapter.

Upon completing this module, you will be able to:

- Choose which scenarios would appropriately use blind addressing in Cisco Unity from a list of possible scenarios

- Describe how messages are delivered and directories replicated

- Describe how SMTP, AMIS, VPIM, and the Cisco Unity Bridge are used to deliver messages

- Describe addressing options in Cisco Unity

- Describe the advantages of Cisco Unity's networking capabilities

- Create and use Internet, AMIS, VPIM, and Bridge Subscribers

Outline

The module contains these lessons:

- Cisco Unity Networking

- Digital Networking in Unity

- SMTP Networking

- VPIM Networking

- AMIS Networking

- Bridge Networking

Cisco Unity Networking

Lesson Overview

This lesson introduces the concepts important to networking in Cisco Unity. You will be looking at message delivery and directory replication, location objects, dialing domains and the various types of networking offered in Cisco Unity.

Importance

In order to implement networking between Cisco Unity and other messaging systems (including, but not limited to, other Cisco Unity servers), you must understand all of the basic concepts and terminology around which it is built. This lesson will define all of the 'building block' concepts for each of the later lessons that focus on particular implementations of networking.

Objectives

Upon completing this lesson, you will be able to:

- Choose which scenarios would appropriately use blind addressing in Cisco Unity from a list of possible scenarios

- Describe how messages are delivered and directories replicated

- Describe addressing options in Cisco Unity

- Describe the advantages of Cisco Unity's networking capabilities

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

- An understanding of the standard features of Cisco Unity

- An understanding of corporate messaging needs

Outline

This lesson includes these sections:

- Overview

- Cisco Unity Networking Defined

- What types of networking are available?

- Unity for Domino Networking

- Unity for Exchange Networking

- Voice Connector for Exchange

- Message Transfer and Directory Replication

- Networking Subscribers

- Summary

Cisco Unity Networking Defined

This section provides a definition and description of what networking means in the Cisco Unity environment.

Networking Defined

- **Message addressing**
- **Auto attendant transfers**
- **Directory lookups**
- **Multiple Cisco Unity servers in one dialing domain**

UCSE v1.1   4 - 4
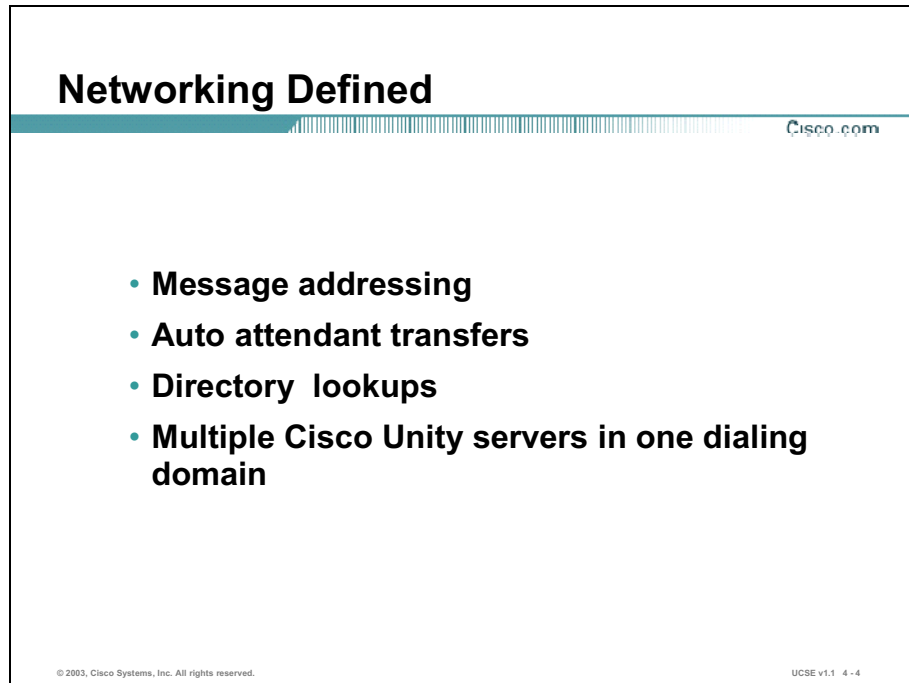
In Cisco Unity, networking is the general term for messaging between Cisco Unity servers and between Cisco Unity and other messaging systems.

Networking used in earlier versions of Cisco Unity had a very restricted meaning; the ability for one subscriber signing in over the telephone to address a message to another subscriber residing on a remote Cisco Unity server, perhaps in another Exchange site. In Cisco Unity 4.0 that definition is much broader. The ability to do most of the things we will mention in the next few paragraphs depends on a telephone switch network and the configuration of the mail store.

In a networked Cisco Unity environment, any subscriber can message any other subscriber in the organization by name or extension. Callers can dial into any Cisco Unity server in the organization and the auto attendant will transfer that call to the correct subscriber in the organization regardless of which Cisco Unity server that subscriber is associated with. Outside callers can dial into any Cisco Unity server in the organization, find any subscriber by name in the alphabetic directory and transfer to them, regardless of which Cisco Unity server that subscriber is homed on. Finally, any number of Cisco Unity servers can be bound together in a dialing domain so that subscribers can address messages and do auto attendant transfers dialing the same number they use to reach that person through the telephone system.

What is Cisco Unity Networking?

Digital

SMTP

VPIM

AMIS

Bridge
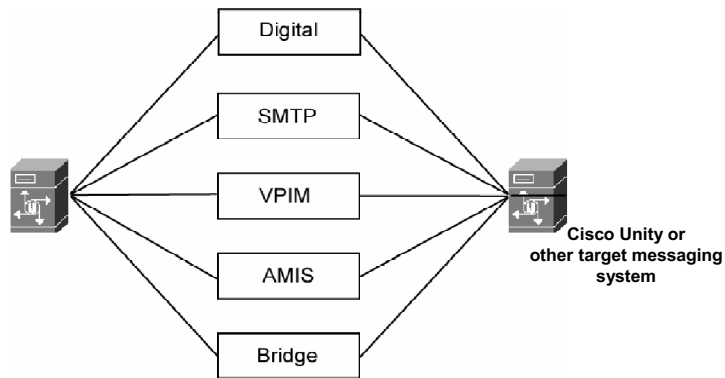
Cisco Unity or
other target messaging
system

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The main goal of networking in Cisco Unity is to deliver messages from a Cisco Unity server to a target and from the target to a Cisco Unity server. The experience a user has is very simple; they leave a message for someone who is a subscriber on the system. They do not need to know what type of server the subscriber resides on, and if it is a server other than Cisco Unity, what communications protocols and software setup are used to make that message transfer. All of that is transparent, as it should be.

What types of Networking are there?

This section introduces the 5 different types of networking that are available with Cisco Unity.
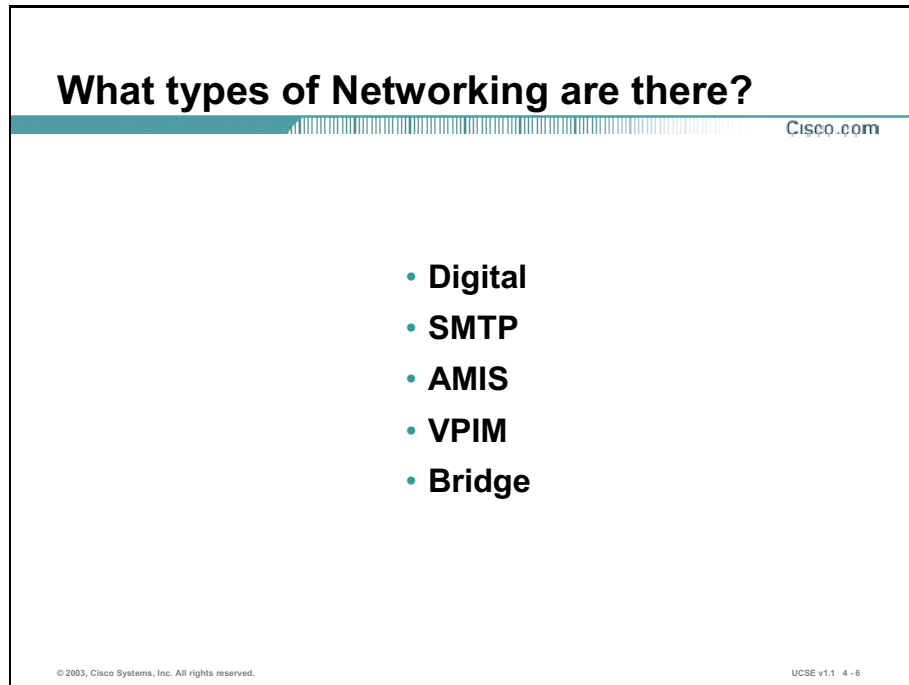
What type of networking you use with Cisco Unity will depend on the target server(s) that you deliver subscriber messages to. We'll take a brief look at each type of target server and the communication method used to reach it.

Digital

If all of the servers are Cisco Unity servers and they all have access to the same global directory, then digital networking is the method to implement.

SMTP

If a target server is a Cisco Unity but it does not have access to the same global directory, then SMTP networking is the method to implement. If the target server is any e-mail server capable of receiving SMTP mail, it is also a candidate for SMTP networking. The major difference between SMTP networking to another Cisco Unity and any other server is the appearance of the message when it arrives at the target server. At a Cisco Unity server if a voice mail was sent, it would retain all of its voice mail attributes (i.e., a subscriber can listen to it over the telephone). If the other target server is any other email server, then the voice message will arrive as an email message with a WAV file attachment.

AMIS

If the target server is another voice mail system, then AMIS networking may be the best implementation. The target server must support the AMIS-a protocol.

VPIM

If the target voice mail system supports the Voice Profile for Internet Messaging (VPIM) protocol, then this would be the preferable method for transferring messages between voice mail servers. VPIM is a digital standard based on SMTP and the Multi-purpose Internet Mail Extension (MIME) protocol. Voice, text and fax messages may be transferred between target servers.

Bridge

If the target voice mail system is a supported Octel voice mail system, then this would be the preferable method for transferring messages between voice mail servers. Bridge uses VPIM, a digital standard based on SMTP and the Multi-purpose Internet Mail Extension (MIME) protocol with some proprietary extension, to exchange messages with Cisco Unity and uses Octel's analog messaging standard for communication with Octel servers. Voice, text and fax messages may be transferred between target servers.

Cisco Unity for Domino Networking

The following section describes the networking options available for Cisco Unity 4.0 for Domino.
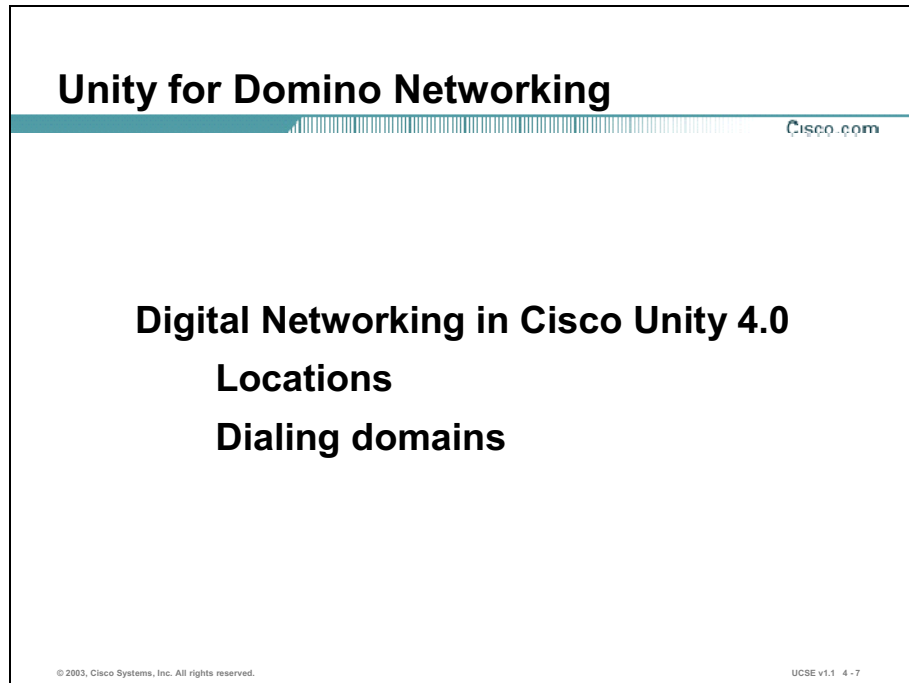
Digital networking, which allows messaging among multiple Cisco Unity servers using a single global directory, is available in Cisco Unity for Domino 4.0. Digital networking is enabled on every Cisco Unity server and is easily configured. The only required configuration is of the primary location object on each server. The primary location object, an undeletable system object created by default when Cisco Unity is installed, contains all of the information each Cisco Unity server needs to send messages to other servers.

Dialing domains are a collection of Cisco Unity servers that are either served by the same telephone system or are attached to a networked telephone system. Dialing domains allow an organization to deal with overlapping dial plans.

Further information about requirements for, and configuration of Digital Networking will be given in a lesson devoted to the topic.

Cisco Unity for Exchange Networking

This section details the types of networking available for Cisco Unity for Exchange in the 4.0 release.

Unity for Exchange Networking

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Digital

SMTP

VPIM

AMIS

Bridge

UCSE v1.1 4 - 8
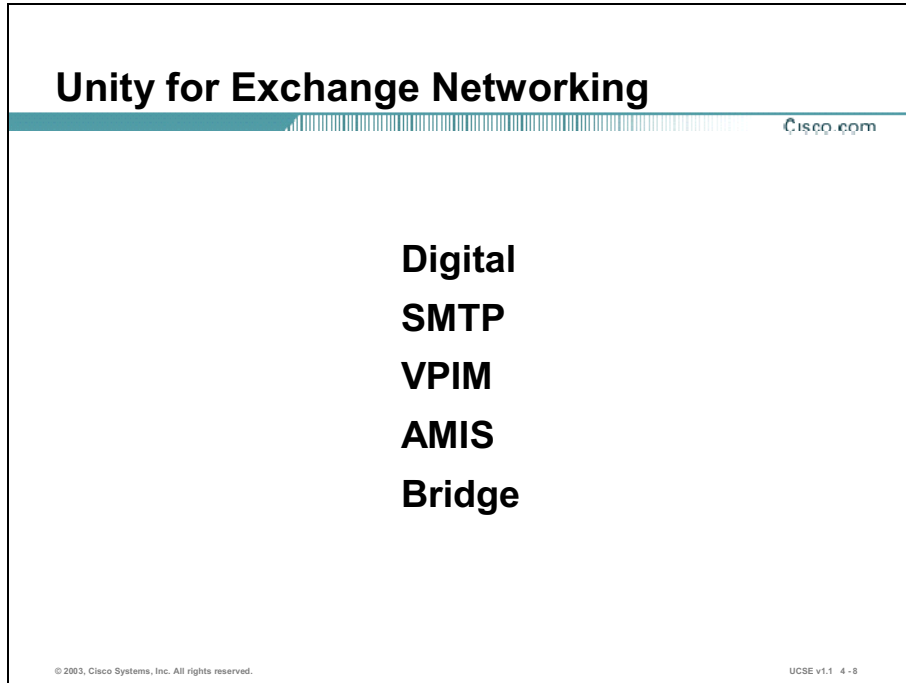
With the addition of the Internet Voice Connector (IVC), Cisco Unity for Exchange 4.0 is capable of the full range of networking solutions. Users may send messages to subscribers residing on other Cisco Unity servers, SMTP servers, VPIM-compliant voice mail servers, AMIS-a compliant voice mail servers, or Octel voice mail servers using the Octel analog protocol. Over the course of the next several lessons you will explore the capabilities and configuration of each of these networking solutions.

The software that enables communication with the wide variety of servers other than Cisco Unity is the IVC. You will take a look at that next.

Internet Voice Connector for Exchange

This section introduces the Voice Connector for Exchange software and its capabilities.

**Internet Voice Connector
for Exchange**

Cisco.com

- **Installed from Unity CD**
- **Uses SMTP (or IMS) Connector**
- **Can Limit Message Size**
- **Address Space Type = VOICE**
- **Uses Extension Address Utility**
- **Version 10.0(2) in Unity 4.0(2)**

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The Internet Voice Connector (IVC) allows two Cisco Unity systems to send and receive voice messages as SMTP mail while preserving the Cisco Unity attributes within the message. It also allows Cisco Unity to communicate with SMTP servers, Octel voice mail servers, VPIM-compliant voice mail servers and AMIS-a-compliant voice mail servers.

Destination type is one of the data objects defined within the location object. Whenever you specify another Cisco Unity as the destination type, the SMTP message is packaged with a binary "blob" that identifies the mail as a Cisco Unity voice mail message to the receiving machine (another Cisco Unity server). The end result is that the message may be played over the telephone as well as played and managed by View Mail for Outlook and *does not* appear as an attached wav file.

The IVC is a separate installation from Cisco Unity and is found on the Cisco Unity Installation CD. Once the connector is installed, it appears as an Exchange connector object similar to the Internet Message Service (IMS) (Exchange 5.5) or SMTP Connector (Exchange 2000) (and is an NT service as well) and thus an entry is created in the Exchange Gateway Address Routing Table for a message type of VOICE. Since the Voice connector uses SMTP, it requires the IMS connector to function properly in Exchange 5.5.

The current version of the Voice Connector is 10.0(2). If you are upgrading to Cisco Unity 4.0, then you should use the latest connector. It is important that you have only one connector installed. Instructions for removing earlier versions of the Connector are very dependent on the version installed. These instructions are found in the *Networking in Cisco Unity Guide (With Microsoft Exchange)*.

If you install the IVC after you have established subscribers on your system and this Cisco Unity system will be a remote location (or AMIS location) to other Cisco Unity systems, you will need to run the Extension Address Utility to generate the proper addresses for your subscribers. The utility will create user addresses of the type VOICE and SMTP, both necessary for blind addressing. Once you install the Internet Voice Connector, any new subscribers added to Cisco Unity will automatically have those addresses generated for them as a part of the normal subscriber creation process. If you change your location ID or domain name after creating extension addresses, you will need to re-run the utility to create correct addresses. Instructions for running the utility are located in the *Cisco Unity System Administration Guide*.

Message Transfer and Directory Replication

This section describes the message transfer and directory replication process in general and then specifically addresses Cisco Unity's interactions with Active Directory in Windows 2000.
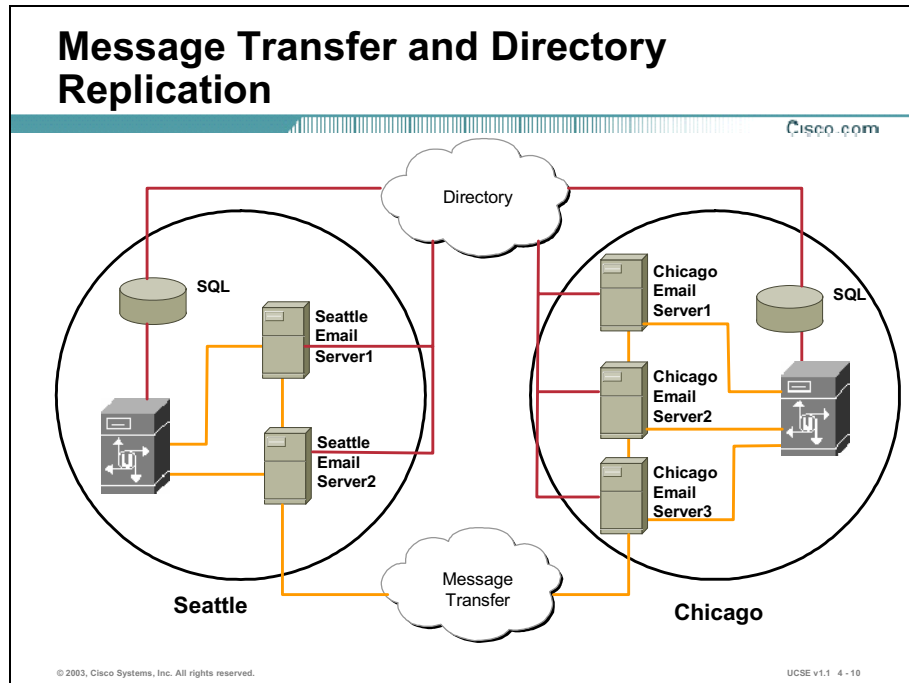
The diagram above is a high-level, conceptual diagram of the connection between two Cisco Unity servers installed on a corporate network. The specific email back-end servers are not (and should not be) an issue at this level. There is a directory that contains information about all the mail users in the company and there is a mail store where they can gain access to their messages, monitor their mailbox, leave messages and so on. As long as the company has a single directory for all it's employees you can add as many "sites" to this diagram as you wish and the model is the same. All of the data in the directory Cisco Unity maintains an interest in (all Unity objects and mail users, public distribution lists, etc. . .) are synchronized with the local SQL database on each of the servers. As such, directory lookups for subscribers across the organization can happen quite quickly.

Information written to the directory from SQL will be a considerably smaller set of data than earlier versions of Cisco Unity. Only information needed to find subscribers, address messages to them and transfer to their phone will be stored in the directory itself; everything else will be on the local SQL database. Here is a list of the subscriber data that is sent to the directory:

■   First name

■   Last name

■   Display name

- Recorded voice name

- Email alias

- Fax ID (used for integration with 3rd party fax servers for routing inbound faxes directly to the subscriber's mailbox.)

- Primary ID (usually the subscriber's work extension. This is the ID they use to log on to the voice mail system.)

- Up to 9 alternate IDs

- Location object assignment

- System ID (this identifies which Cisco Unity server the subscriber is associated with

- Transfer string (the specific digits necessary to ring the subscriber's phone. This can include trunk access codes, pauses and DTMF digits. There can only be one string per subscriber.)

All of this, in addition to all of the other information known about subscribers, is first written to the local SQL database in Seattle when you add a subscriber there. On its regular replication schedule the SQL database pushes the items listed above to the directory. From there the changes are picked up by the other SQL database(s). This way, a subscriber in Chicago could look up that Seattle subscriber by either name or extension and hear their voice name back as confirmation when addressing a message.

In this diagram, the direct message connections are limited to the servers in the local site. Any subscriber can send messages to users outside the site by using the Message transfer "cloud" (i.e., the MTA in Exchange 5.5), however you can only log in and access messages on a server in your site. The same sorts of limitations apply to Exchange 2000, and Domino. Only the names of the defined boundaries will change.

Examples

Let's take a detailed look at how messages are transferred within and between Exchange sites (5.5) and routing groups (2000), and then we'll look at how Cisco Unity interacts with Active Directory in Windows 2000 as a way of examining that directory replication process.

Intra-site Messaging in Exchange 5.5

If a server in a site is the only server in that site, all messages and directory information reside on that server. However, if two or more servers exist in a site, messages must be delivered to the correct home server and directories must be replicated. To accomplish delivery of messages, Exchange 5.5 relies on the Directory Service (Exchange 2000 relies on Active Directory) to provide information about where the recipient is "homed'. The home server for a recipient is specified when the recipient is created, but may be modified by an administrator at any time and is the server where the recipients mail is physically kept *on disk* for retrieval. Once a server is added to a site, directory replication occurs automatically so that each server in the site knows the list of recipients on every other server in that site. Directory replication occurs approximately every five minutes and typically does not need to be modified. The following diagram and explanation reviews how messages are passed within an Exchange 5.5 site with multiple servers.
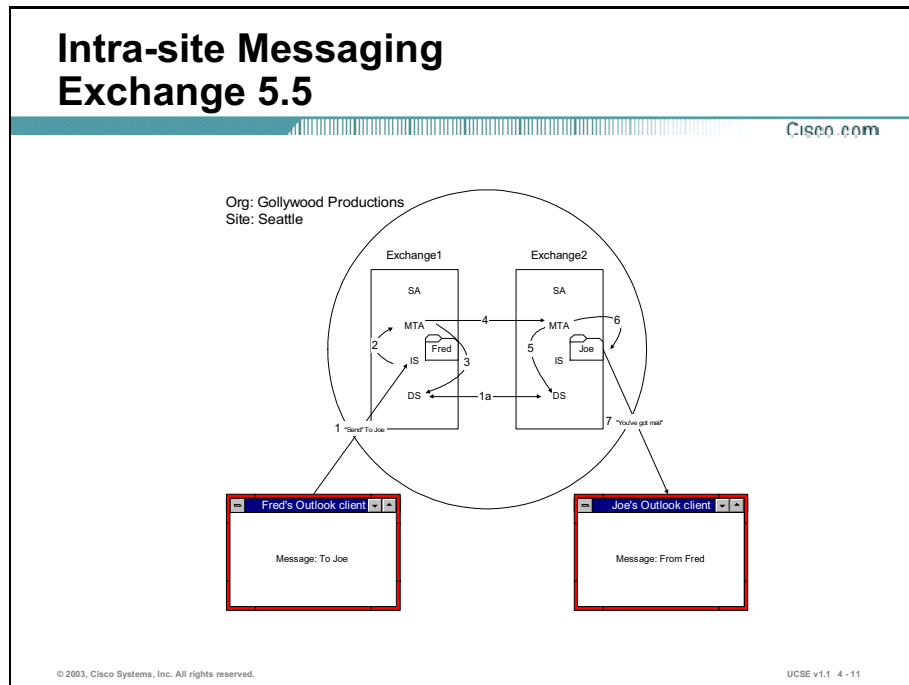
The numbers of the steps correspond to those in the drawing.

Step 1   Fred composes a message, addresses it to Joe, and sends it.

Step 2   The Exchange1 IS sends a message to the MTA for delivery to a remote Exchange server.

Step 3	Exchange1's MTA performs a directory lookup in the DS and finds the Distinguished name of the remote server's MTA.
Step 4	The Exchange1 MTA opens an association (connection) with the Exchange2 MTA and delivers the message.
Step 5	The Exchange2 MTA performs a directory lookup in the DS and finds that Joe's mailbox is homed locally.
Step 6	The Exchange2 MTA delivers the message to the IS.
Step 7	Joe sees a new message from Fred show up in his mailbox.

Replication

Within sites, all directory services communicate with each other directly to keep the Exchange Directory up to date. This happens approximately 5 minutes after a change.

Intersite Message Passing & Directory Replication
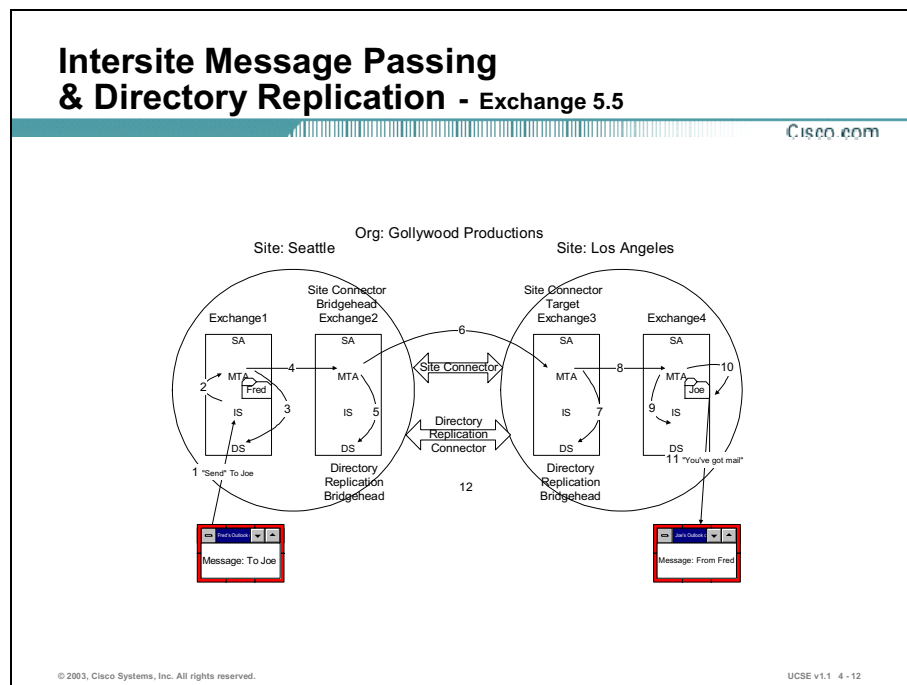
Connecting multiple servers in multiple sites is very similar to a single site, but with a few exceptions. As the Exchange Administrator, you must manually set up messaging connectors and directory replication connectors between sites. Messaging connectors include Site connectors, X.400 connectors, Internet Mail Service connectors (IMS), and Dynamic Remote Access Service connectors (DRAS). You should carefully choose which messaging connector you use since each one provides a different set of features such as connector on/off scheduling and user and message size restrictions.

After you set up your messaging connector(s), you set up the appropriate directory replication connectors based on your organization topology. Since the Directory Replication connector relies on a messaging connector to send its directory replication messages, it can only be set up

after a messaging connector is installed. Directory replication between sites is scheduled to occur every 3 hours by default, but may be accelerated. Upon initial installation of the Directory Replication connector, directory replication occurs within a few minutes and typically does not need to be accelerated. After the initial replication, only *changes* are sent on subsequent updates of the directory. Once directory replication has completed, subscribers can address messages to anyone in the organization by accessing either the Cisco Unity telephone directory conversation or the Exchange based GAL (global address list).

The preceding diagram and explanation reviews how messages are passed within an Exchange 5.5 organization with multiple sites and servers. The numbers of the steps following correspond to those in the drawing.

Step 1   Fred composes a message, addresses it to Joe, and sends it.

Step 2   The Exchange1 IS sends a message to the MTA for delivery to a remote Exchange server.

Step 3   Exchange1's MTA performs a directory lookup in the DS and finds the Distinguished name of the remote server's MTA.

Step 4   The Exchange1 MTA notices that Joe's home server is in the remote site Los Angeles and chooses the Site Connector. The Exchange1 MTA sees that it must send all mail using the site connector to the site connector bridgehead, Exchange2.

Step 5   The Exchange2 MTA performs a directory lookup in the DS, realizes that it must pass this message to the remote site Los Angeles and uses the site connector.

Step 6   Because Exchange2 is the site connector bridgehead, its MTA makes a connection to the Los Angeles site connector target server, Exchange3 and delivers the message.

Step 7   Exchange3's MTA performs a directory lookup and sees that Joe's home server is Exchange4.

Step 8   Exchange3's MTA passes the message to the Exchange4 MTA.

Step 9   Exchange4's MTA performs a lookup and sees that Joe is homed on Exchange4.

Step 10   Exchange4 MTA passes the message to the IS.

Step 11   Joe sees a new message appear in his Inbox.

Directory Replication between Sites

In order for directory replication to occur between sites, you must install the directory replication connector after you install a site connector. As part of the installation process, you must define a bridgehead server in each site. Replication between these bridgehead servers then occurs once every three (3) hours by default. This number may be changed in the Connector's property pages. All DS changes are sent between bridgeheads as mail messages. The local MTAs are responsible for delivery.

Intra-routing group Message Passing & Directory Replication

Exchange 2000 uses routing groups to perform functions similar to sites in Exchange 5.5. If a server in a routing group is the only server in that group, all messages and directory information reside on that server. However, if two or more servers exist in a routing group, messages must be delivered to the correct home server and directories must be accessed. To accomplish delivery of messages, Exchange 2000 relies on Active Directory to provide information about where the recipient is "homed". The home server for a recipient is specified when the recipient is created, but may be modified by an administrator at any time and is the server where the recipients mail is physically kept *on disk* for retrieval. Once a server is added to a site, directory information is shared automatically so that each server in the site knows the list of recipients on every other server in that site. Directory information is available to all servers that are members of the same forest automatically. The following diagram and explanation reviews how messages are passed within an Exchange 2000 routing group with multiple servers.
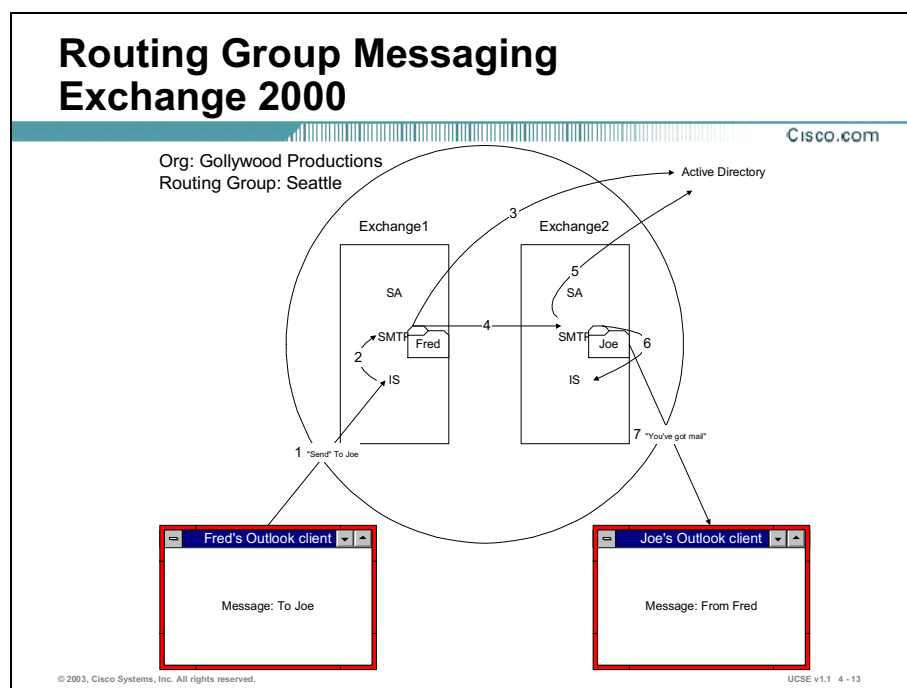
The numbers of the steps below correspond to those in the drawing.

Step 1   Fred composes a message, addresses it to Joe, and sends it.

Step 2   The Exchange1 IS sends a message to the SMTP for delivery to a remote Exchange server.

Step 3   Exchange1's SMTP performs a directory lookup in the Active Directory and finds the Distinguished name of the remote server's SMTP.

Step 4   The Exchange1 SMTP opens an SMTP connection with the Exchange2 SMTP and delivers the message.

Step 5   The Exchange2 SMTP performs a directory lookup in the Active Directory and finds that Joe's mailbox is homed locally.

Step 6   The Exchange2 SMTP delivers the message to the IS.

Step 7   Joe sees a new message from Fred show up in his mailbox.

Replication

Active Directory handles all directory services within a Windows 2000 forest, which maintains a 1 – 1 correspondence with the Exchange organization. The time it takes to replicate information will vary depending on what Windows 2000 knows about the links between servers and groups. Inside a routing group all servers should be on fast, permanent LAN links, so replication of updated attributes of directory objects takes place every 5 minutes.

Routing Group Message Passing
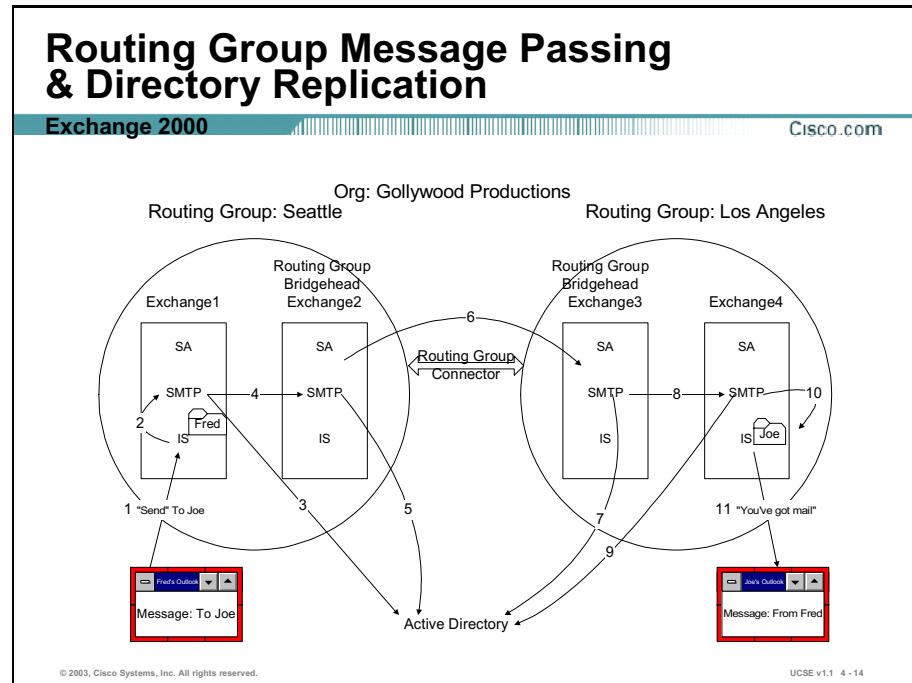
Connecting multiple servers in multiple routing groups is very similar to a single routing group, but with a few exceptions. As the Exchange Administrator, you must manually set up routing group connectors between groups. You do this by establishing bridgehead servers in both routing groups and setting a cost for each route. If you have multiple routing groups configured with alternate paths, it is possible for Exchange 2000 to deliver messages even if the primary link between two routing groups is down.

The diagram above and explanation reviews how messages are passed within an Exchange 2000 organization with multiple routing groups and servers. The numbers of the steps following correspond to those in the drawing.

Step 1   Fred composes a message, addresses it to Joe, and sends it.

Step 2   The Exchange1 IS sends a message to the SMTP for delivery to a remote Exchange server.

Step 3   Exchange1's SMTP performs a directory lookup in the Active Directory and finds the Distinguished name of the remote server's SMTP.

Step 4   The Exchange1 MTA notices that Joe's home server is in a different routing group, Los Angeles, and, after consulting its internal link-state table chooses the least cost Routing Group Connector. The Exchange1 SMTP sees that it must send all mail using the routing group connector to the group bridgehead, Exchange2.

Step 5   The Exchange2 SMTP performs a directory lookup in the AD, realizes that it must pass this message to the routing group Los Angeles and uses the connector.

Step 6   Because Exchange2 is the connector bridgehead, its SMTP makes a connection to the Los Angeles connector target server, Exchange3 and delivers the message.

Step 7   Exchange3's SMTP performs a directory lookup and sees that Joe's home server is Exchange4.

Step 8   Exchange3's SMTP passes the message to the Exchange4 SMTP.

Step 9   Exchange4's SMTP performs a lookup and sees that Joe is homed on Exchange4.

Step 10   Exchange4 SMTP passes the message to the IS.

Step 11   Joe sees a new message appear in his Inbox.

Active Directory Replication

Active Directory, a directory service built using Internet-standard technologies, is fully integrated with Exchange 2000. All Exchange directory information is stored within Active Directory, which stores data for a large and customizable set of objects. This ability to be customized is what Cisco Unity takes advantage of during installation when it extends the Active Directory schema. All domain controllers in a forest contain a copy of the same Active Directory database. Once the initial directory is built, Active Directory replicates changed or updated *attributes* of an object to all other domain controllers in its forest. Once directory replication has completed, subscribers can address messages to anyone in the organization by accessing either the Cisco Unity telephone directory conversation or the Exchange based GAL (global address list).

Let's take a detailed look at the way Cisco Unity interacts with the Active Directory. We'll start with two Cisco Unity systems installed in the same Active Directory Forest.
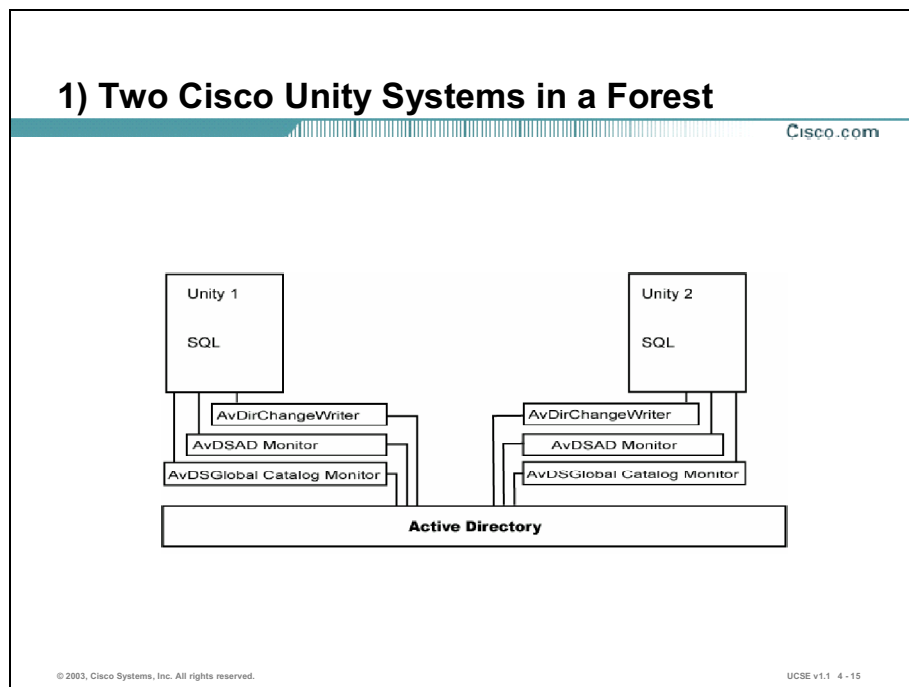
A typical administrative action might be the addition of a new subscriber using Cisco Unity's HTML administration tool.

2) New User Added In Unity1 SA

Unity 1
SQL

New user added

Unity 2
SQL

AvDirChangeWriter
AvDSAD Monitor
AvDSGlobal Catalog Monitor

AvDirChangeWriter
AvDSAD Monitor
AvDSGlobal Catalog Monitor

Active Directory
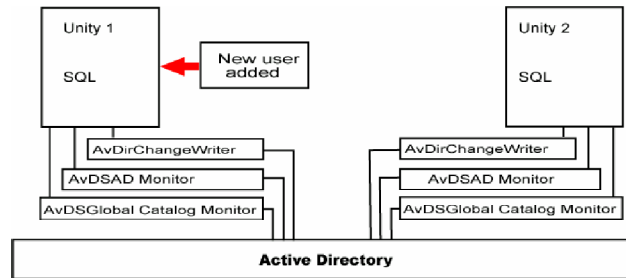
UCSE v1.1   4 - 16

Once the administrator saves the data it is written to Unity1's local SQL database.

3) Data Added to SQL Database

Unity 1
new SQL data

New user added

Unity 2
SQL

AvDirChangeWriter
AvDSAD Monitor
AvDSGlobal Catalog Monitor

AvDirChangeWriter
AvDSAD Monitor
AvDSGlobal Catalog Monitor
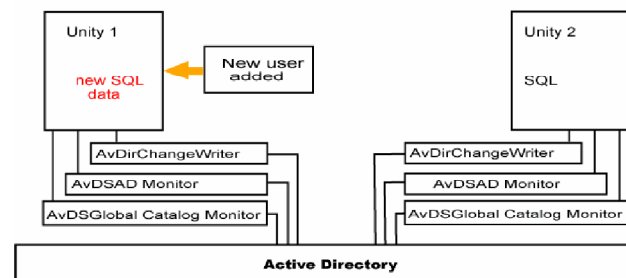
Active Directory

UCSE v1.1   4 - 17

The Unity1 Directory Change Writer (AvDirChangeWriter) sees the data and sends the relevant pieces of it (detailed earlier in this lesson) to Active Directory.

4) ChangeWriter Sends Data to AD
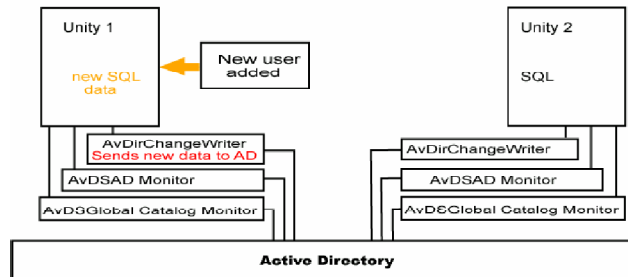
Now that the data is located in Active Directory, it is replicated through the forest on its already established schedule.

5) Active Directory
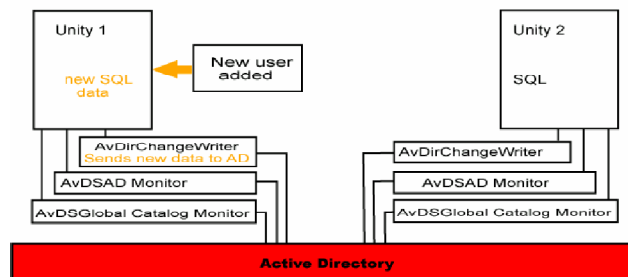
The Unity2 server's Global Catalog Monitor (AvDSGlobalCatalogMonitor), a service that continuously monitors the Active Directory, notices the change.

6) Global Catalog Monitor Picks Up the Change
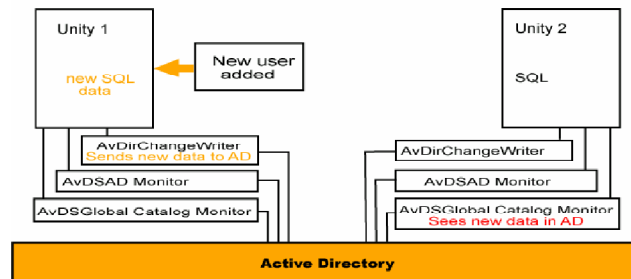
The Global Catalog Monitor passes a message to the Change Writer to send the changes to the local SQL database in Unity2.

7) ChangeWriter Sends the Data to SQL
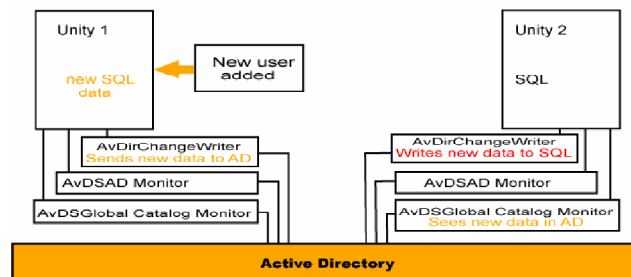
Any subscriber or outside caller reaching Unity2 can now address and send messages to the new subscriber on Unity1.

8) Unity2 Knows About the New Unity1 User
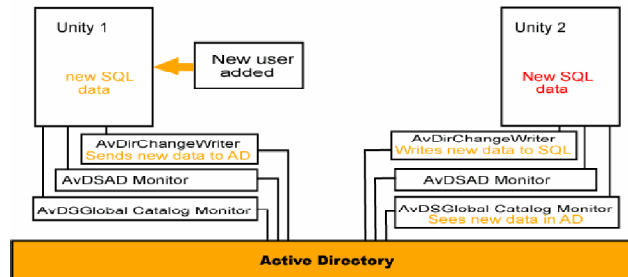
The process detailed above is what makes Digital Networking in Cisco Unity 4.0 so easy to set up and efficient. Because each Cisco Unity's primary location object is configured, all subscribers homed on that server are known to all subscribers in the forest and messages addressed from any Cisco Unity server in the forest will be delivered.

Networking Subscribers

This section details the options available for adding subscribers and presents a decision tree for choosing the most appropriate type of subscribers.
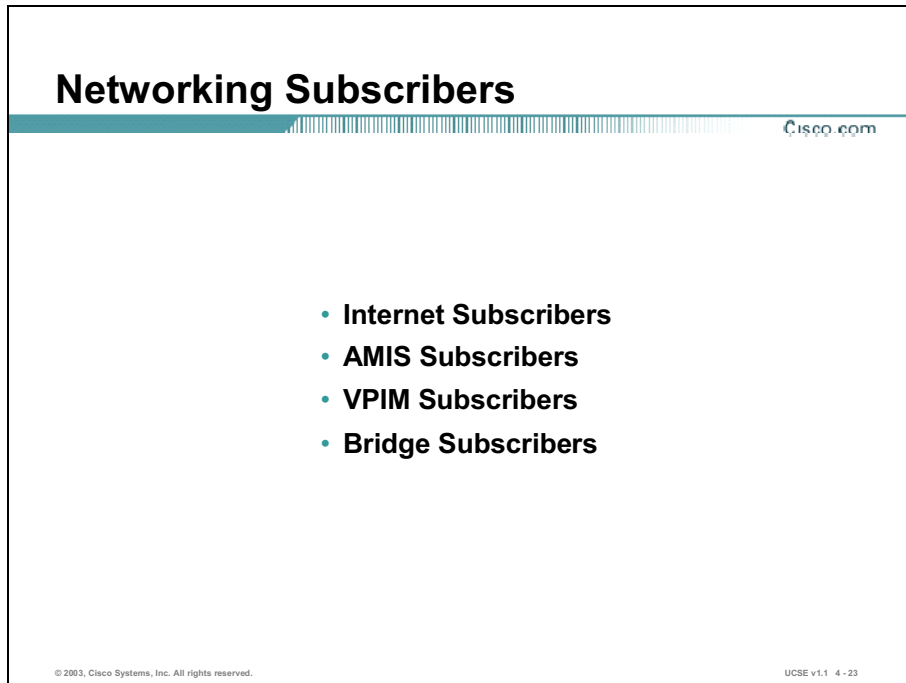
Internet Subscribers

Internet Subscribers are a special type of Cisco Unity voice mail user used specifically for networking and SMTP mail delivery. When you add a new subscriber in the Cisco Unity Administrator, a radio button option allows you to create an Internet Subscriber (Mailbox) and specify an SMTP address for that user. This is similar to an Exchange Custom Recipient (a contact in Windows 2000/Exchange 2000); the Internet Subscriber is actually a mailbox that has no local message store.

When creating an Internet Subscriber, setup options relating to the local message store are not available. These options include phone password, private lists, conversation, and message notification. In other words, the mailbox acts as a pointer to the SMTP address you specify when you create the Internet Subscriber account. Both outside and internal callers benefit from the ability to address messages to the subscriber over the telephone in most cases and internal users also have an option to address to them using the GAL. The Internet Subscriber has a recorded voice name and greeting just like any other Cisco Unity subscriber. The main difference between a regular Cisco Unity subscriber and an Internet Subscriber is that when mail is left for Internet Subscribers, the mail is delivered out the SMTP Gateway (IMS) to its Internet destination as specified within their account. The end location could be any other mail server or even another voice mail system and therefore allows off-site users to look and feel to the sender as if that recipient was actually *on-site* (i.e., field technicians or outside sales personnel).

Additionally, you can use Internet Subscribers to link offices without the need to set up messaging connectors and directory replication connectors between sites. However, the administrator must manually and individually set up Internet Subscribers for each destination location. This may be unacceptable where a large number of users exist in remote offices. For organizations with many users in various locations, Blind Addressing is typically a better choice than Internet Subscribers

AMIS Subscribers

Cisco Unity Version 4.0 offers users the ability to interface with third party voice mail systems using the Audio Messaging Interchange Specification analog protocol (AMIS-a). AMIS subscribers are much like Internet Subscribers with one important difference. While an Internet Subscriber's off-box storage is generally another email system, an AMIS Subscriber's off-box storage is going to be a different voice mail system. They would be set up as Custom Recipients in Exchange 5.5 or contacts in Active Directory.

As with Internet Subscribers, any options relating to the local message store are unavailable. This means that AMIS subscribers can't log on to Cisco Unity to check or send messages, log onto Cisco Unity via the telephone or use Active Assistant to change personal settings, own private lists, set up or receive message notification, or receive message waiting indication via Cisco Unity. Messages sent to an AMIS subscriber are transferred to the target voice mail system through telephone calls placed from one server to the other and messages played over the analog phone lines.

VPIM Subscribers

Cisco Unity Version 4.0 offers users the ability to interface with third party voice mail systems using the Voice Profile for Internet Messaging (VPIM). As with AMIS a VPIM Subscriber's off-box storage is going to be a different voice mail system. They would be set up as contacts in Active Directory. The main difference is that the messages are transmitted via SMTP rather than as an analog message over the PSTN.

As with Internet Subscribers, any options relating to the local message store are unavailable. This means that VPIM subscribers can't log on to Cisco Unity to check or send messages, log onto Cisco Unity via the telephone or use Cisco Unity Assistant to change personal settings, own private lists, set up or receive message notification, or receive message waiting indication via Cisco Unity.

Bridge Subscribers

Version 4.0 of Cisco Unity offers users the ability to interface with Octel voice mail systems using the Cisco Unity Bridge as a networking gateway to an analog Octel network. Bridge subscribers are much like Internet and AMIS subscribers with one important difference. While an Internet subscriber's off-box storage is generally another email system and a VPIM or an AMIS Subscriber's off-box storage is going to be a different voice mail system, Bridge subscribers' messages reside on an Octel voice mail system. They would be set up as Custom Recipients in Exchange 5.5 or contacts in Active Directory.

Bridge, VPIM, and AMIS subscribers share all other features with regular Cisco Unity subscribers. You can give them an off-campus telephone number and calls will be transferred

there. Outside callers may look up Internet, Bridge, VPIM, or AMIS subscribers in the directory (unless you have restricted this access) and leave them voice mail. They can be members of distribution lists. As you can see, the main purpose of these recipients is to receive messages in a transparent manner.

Choosing Subscriber Addressing

This section provides information on the choices you can make when using Internet, AMIS, VPIM, and Bridge subscribers or blind addressing of each type.
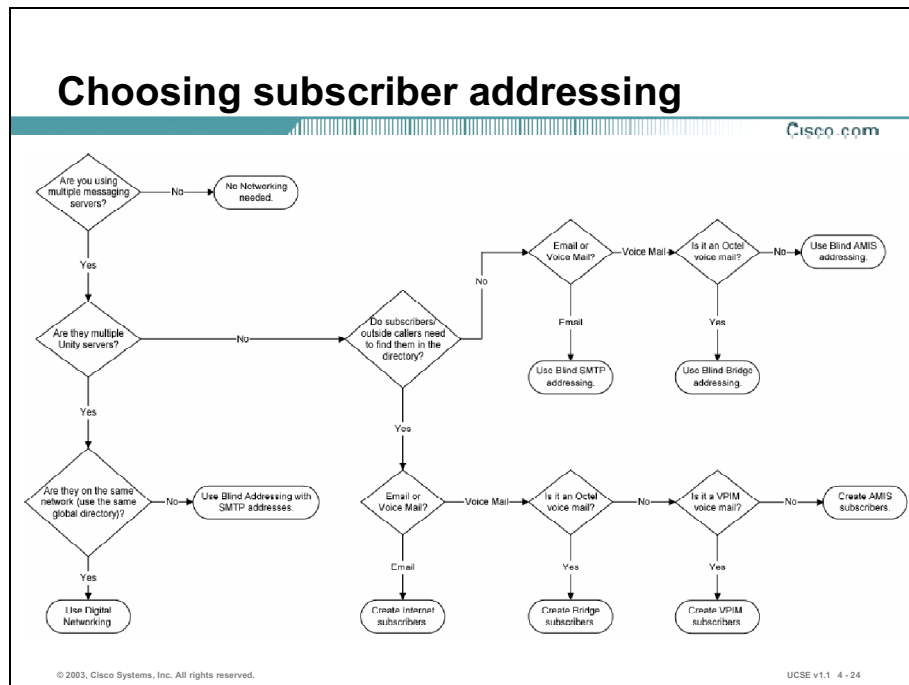
The flowchart on the slide above represents a decision tree for choosing what kind(s) of subscribers to create on a Cisco Unity server. The choices are not mutually exclusive. It is possible, because of multiple message targets, to need several of the subscriber addressing options.

After asking a series of 3 or 4 questions, you can determine which type of target server and what kind of addressing to use. First, find out whether all of the target servers are Cisco Unity servers, and if they are, whether they all use the same global directory. If they do, then implementing digital networking is the best choice. If not, Blind SMTP addressing will work best

If you know the servers are not Cisco Unity servers, but you want callers to be able to find these subscribers in the directory, then you will implement them as AMIS, VPIM, Internet, or Bridge subscribers. Which one you choose is dependent on the target server. If the target servers are not Cisco Unity servers and you do not wish to have the subscribers listed in the directory, then blind addressing will work best.

Summary

This section summarizes the key points discussed in this lesson.

Summary

Upon completion of this lesson, you should be able to perform the following tasks:

- **Choose which scenarios would appropriately use blind addressing in Cisco Unity from a list of possible scenarios**
- **Describe how messages are delivered and directories replicated**
- **Describe addressing options in Cisco Unity**
- **Describe the advantages of Cisco Unity's networking capabilities**

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Next Steps

After completing this lesson, go to:

■ Digital Networking in Cisco Unity

References

For additional information, refer to these resources:

■ *Networking in Cisco Unity Guide (With Microsoft Exchange)*

■ *Networking in Cisco Unity Guide (With IBM Lotus Domino)*

■ *Cisco Unity Bridge Networking Guide*

Digital Networking in Cisco Unity

Lesson Overview

In organizations with multiple Cisco Unity servers, Digital networking is the feature that allows subscribers to exchange voice messages with other Cisco Unity servers. In this lesson you will learn how to implement Digital Networking and about the components that make it up.

Importance

Digital Networking is enabled on every Cisco Unity server. Understanding the basic concepts of Digital Networking and the details of how to implement them will enable you to provide those features in a seamless and efficient manner.

Objectives

Upon completing this lesson, you will be able to:

■ Choose the definition that describes Cisco Unity digital networking correctly.

■ Configure the default location object correctly.

■ Determine whether it is appropriate to use a dialing domain in a stated customer configuration or explain why it is not.

■ Choose those Cisco Unity software components that are used to implement digital networking.

■ Create and use location objects.

■ Choose which search options are appropriate in the Cisco Unity System Administrator given a particular addressing and server configuration scenario.

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

- An understanding of corporate messaging needs

- Knowledge of Cisco Unity messaging

- Understanding of concepts presented in the Cisco Unity Networking lesson

Outline

This lesson includes these sections:

- Overview

- Locations and Digital Networking

- Implementing Digital Networking

- Dialing Domains

- Defining Searches

- Summary

Locations and Digital Networking

This section introduces location objects in Digital Networking.

Locations and Digital Networking

- **Primary Location Object**
  - **Contains information Unity needs to route messages between Unity servers**
  - **Name reflects geographical location**
  - **Numbering plan only required if using Blind addressing and addressing across organizations using SMTP and IVC.**

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Location objects are the star player in the Digital Networking game. When you install Cisco Unity, a single default location referred to as the Primary Location Object (noted as the Default Location Object when Cisco Unity is first installed) is created. As subscribers are added to Cisco Unity, they become members of this location. The Cisco Unity Administrator allows you to create additional location objects that represent other messaging servers, including Cisco Unity. If you are in the same Active Directory forest, there is no need to create additional locations, as they will be available within minutes of their creation as a default object on their home system. Location objects can be "tied " together using a property called a Dialing Domain ID. This allows you to create a meta-location that spans multiple Cisco Unity servers by assigning them all the same Dialing Domain ID. This allows you to easily span sites or other networking boundaries and to provide "transparent" dialing capabilities to customers that have networked telephone switches.

Recorded object data for the location object includes voice name for addressing, display name for the administrative console, three DTMF names (one for each keypad mapping), DTMF - ID for addressing, SMTP-Address (for blind addressing), destination type, send blind flag, and information about the keypad mapping used at that location. In Cisco Unity, subscribers and any other system objects can only be associated with the primary location object created by the Setup program. All other location objects are used solely for addressing purposes.

When outside callers use the Cisco Unity directory, they are presented with a list of names that includes members of the Primary Location Object. Directory search options can be configured so that all other administrator-created locations are available to all callers. Users associated

with any location object other than the default object may be added to Public and Private distribution lists or added to message address lists by subscribers only.

When defining the primary location object, you give it a Dial ID. Creating a dial plan for your organization that will result in callers reaching subscribers correctly and efficiently is very important. The Dial IDs that you create are an important part of that dial plan. Be sure that they do not conflict with previously assigned IDs.

In the Cisco Unity Administrator, all location objects will be visible, but administrators will only be able to edit/delete location objects that were created on their Cisco Unity system. Location objects that replicate from other sites will be read-only. The original location object that is installed with the system (the primary location object) can be edited but not deleted from the system.

Implementing Digital Networking

This section provides you with information on setting up Digital Networking.

Requirements for Digital Networking

Cisco.com

- **Domino**
  - **Partner servers in the same Notes domain**
  - **Each Unity server monitors the primary Domino directory for Domain names.nsf**
- **Exchange**
  - **Same AD forest**
    - **Or**
  - **Same Exchange 5.5 site**
    - **Or**
  - **Different Exchange 5.5 sites/same org/directory replication connectors**

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Implementing Digital Networking in Cisco Unity is easily accomplished once you understand the requirements. All subscribers who expect to send messages to one another using this feature must be able to see each other's address. Practically, this means that in a Domino environment all the partner servers must be in the same Notes domain and that each Cisco Unity server monitors the Domino directory for the Domain names.nsf file. In an Exchange environment, all servers must either be members of the same Active Directory forest, be members of the same Exchange 5.5 site, or be members of sites in an Exchange 5.5 organization that are connected for directory replication.

With these conditions met, all subscribers will be able to see all locations and subscribers at those locations.

Set up procedure

Setting up Digital Networking

- **Make Dial plan decisions**
- **Customize primary location object**
- **Set search options**
- **Add alternate extensions (optional)**
- **Set up automated attendant transfers (optional)**

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The setup procedure is very simple. Once you make dial plan decisions, you can customize primary location objects on all Cisco Unity servers. Search options in Cisco Unity will be addressed next in this section. Alternate extensions provide 2 benefits; the ability to provide easy message access (automatic sign in to a subscriber account) from telephones other than the subscriber's primary extension and providing an extension address that matches the one other subscribers use to reach a subscriber on a networked telephone system. If the Cisco Unity servers are attached to a networked telephone system, then you should also set up automated attendant transfers. If each Cisco Unity server is integrated with a separate phone system, this step is not necessary.

Search Options

Defining Searches

This Server

• **Will search the local server**

This Server's Dialing Domain

• **If the server has been made part of dialing domain, it will search the servers that are assigned to that dialing domain**

The Global Address List

You define searches in Cisco Unity to put parameters on how extensive a search will be in several cases; when a subscriber is addressing a message, when subscribers are being added to public or private distribution lists, when callers reaching the opening greeting for your company or when an outside caller is looking for a subscriber in the directory. By default Cisco Unity limits searches to the local server that a call originates on. If your servers are attached to a networked phone system, then you will have identified each server's primary location object as being part of a Dialing Domain. If you limit searches to the dialing domain, then an outside caller or subscriber will be able to find subscribers in the domain no matter what server they are on. Callers can be transferred to their extension no matter what Cisco Unity server initially took the call. The widest possible scope is to allow people to search the entire global address book. There may be good reasons for doing this; your customer's needs will guide you here.

Dialing Domains

This section introduces the concept of dialing domains in Cisco Unity.

Dialing Domains

- **A collection of Cisco Unity servers integrated with the same phone system or phone system network**
- **A grouping scheme that allows Cisco Unity to handle overlapping dial plans**

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In a networked phone system, subscribers can dial one another without having to use a trunk access code or prefix. Within a networked phone system all extensions must be unique. If a company has several Cisco Unity servers with some attached to a networked phone system and others attached to separate phone systems, then the networked phone systems and the separate systems may have an overlapping dial plan with no ill effects. Dialing domains in Cisco Unity working with a networked phone system allow for several features to be implemented.

Dialing Domain Features

Subscribers can address messages using the same number they use to call another subscriber

Public and private distribution list membership

Automated attendant transfers

Directory assistance with transfers

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First, subscribers can address messages directly to subscribers residing on other Cisco Unity systems (and if alternate extensions are implemented, this number may be the same number they use to reach the subscriber directly by telephone). Subscribers on any Cisco Unity within the dialing domain can be added to public or private distribution lists. Outside callers dialing in to any Cisco Unity server in the dialing domain can look up any subscriber in the directory and be transferred to that subscriber. This assumes that the search scope has been expanded to include the dialing domain.

One thing to be aware of is that identified subscriber messaging will not work across dialing domains. If a subscriber calls another subscriber on a networked phone system and the call is passed to Cisco Unity by the phone system, the calling subscriber's extension ID is not forwarded so the call is treated as one from an outside caller.

Summary

This section summarizes the key points discussed in this lesson.

Summary

Upon completion of this chapter, you should be able to perform the following tasks:

- **Choose the definition that describes Cisco Unity digital networking correctly.**
- **Configure the default location object correctly.**
- **Determine whether it is appropriate to use a dialing domain in a stated customer configuration or explain why it is not.**

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Summary

Upon completion of this chapter, you should be able to perform the following tasks:

- **Choose those Cisco Unity software components that are used to implement digital networking.**
- **Create and use Location Objects.**
- **Choose which search options are appropriate in the Cisco Unity System Administrator given a particular addressing and server configuration scenario.**

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Next Steps

After completing this lesson, go to:

■ SMTP Networking

References

For additional information, refer to these resources:

■ *Networking In Cisco Unity Guide (With IBM Lotus Domino)*

■ *Networking In Cisco Unity Guide (With Microsoft Exchange)*

SMTP Networking

Lesson Overview

With SMTP Networking in Cisco Unity subscribers on a local server can send voice messages to people who do not have mailboxes on the local Exchange network. These could be Cisco Unity subscribers who access a different directory on the messaging system or individuals who have a messaging account on a computer connected to the Internet.

Importance

Cisco Unity subscribers' messaging needs extend beyond the range of subscribers on the local system. SMTP networking allows you to extend the reach of subscribers' voice messaging to any messaging system available on the Internet.

Objectives

Upon completing this lesson, you will be able to:

- Describe how Cisco Unity uses SMTP networking to deliver messages

- Create and use Internet Subscribers

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

■ An understanding of corporate messaging needs

■ Knowledge of Cisco Unity messaging

■ Understanding of concepts presented in the Cisco Unity Networking lesson

Outline

This lesson includes these sections:

■ Overview

■ SMTP Networking

■ Setting Up SMTP Networking

■ Internet Subscribers

■ Summary

SMTP Networking

This section gives an overview of SMTP Networking in Cisco Unity for Exchange.

Simple Mail Transport Protocol (SMTP) is designed to send mail to receiving servers that are always on-line. Since it is not convenient (and possibly not affordable) to be connected to the network at all times, Post Office Protocol version 3 (POP3) and Internet Message Access Protocol (IMAP4) developed. POP3 allows users to dial-up and collect their mail from a Point-of-Presence typically an Internet Service Provider (ISP). IMAP allows for the same dial-up collection of mail, but is even more conservative of bandwidth, only downloading the headers of messages to begin with. In simpler terms, SMTP is used to send and POP3 and IMAP4 are used to receive. However, if the sender and receiver are always online, they only need SMTP. For the remainder of our discussion, we will focus on the implementation of SMTP in the two most recent versions of Exchange.

In Exchange 5.5 the Internet Mail Service (IMS) connector provides Internet mail services using the SMTP, IMAP4, and POP3 protocols. The IMS connector is installed and configured through the Exchange Administrator and requires a DNS (Domain Name Service) server in order to properly perform name resolution of FQDNs (Fully Qualified Domain Names) for delivery of messages. A Fully Qualified Domain Name is one that follows the pattern of recipient@domain.com. When an Exchange user is created, an SMTP address is generated automatically using the recipient's Exchange alias followed by *Site.Organization.com* where site and organization corresponds to the site and organization names of the Exchange server. Most administrators use the Exchange Administrator tool to modify the site addressing to *organization.com* (removing the site name) to allow for easier addressing when sending SMTP mail. Additionally, you may modify the .com extension as necessary based on your particular naming requirements. Common examples include. edu, org., and gov.

The IMS service (or gateway) allows you to send electronic mail to users on both Exchange and non-Exchange mail servers. The IMS queries the DNS server to determine the name of the server responsible for accepting mail for the recipient domain, connects to that server, and delivers the mail.

Exchange 2000 uses SMTP explicitly. When Windows 2000 Internet Information Services (IIS) is installed, SMTP is one of the services that is installed with it. Exchange 2000 uses SMTP as its message transport mechanism. Even if it is not configured in Exchange, it is still used for the transfer of mail. The SMTP Connector in Exchange 2000 adds functionality and manageability to SMTP. You can define routes for SMTP traffic, relay messages to specific domains and configure inbound and outbound security.

Domain Name Service (DNS) is critical to the correct functioning of Active Directory and Exchange 2000. You must have a well-designed, reliable DNS implementation if you want to have a reliable and efficient Windows 2000/Exchange 2000 messaging system.

Cisco Unity uses the standard SMTP connector in Microsoft Exchange (the IMS in Exchange 5.5) to provide messaging among Cisco Unity servers that are not on the same directory and to individuals who are not using Cisco Unity as their messaging server. The SMTP Connector provides the ability to send and receive messages through the Internet to computers supporting SMTP. This means that both Exchange and non-Exchange servers can receive messages from Cisco Unity.

While SMTP provides distinct advantages for sending electronic mail over the Internet, it does have several possible disadvantages. Voice mail will lose its Cisco Unity specific attributes when traveling to a non-Cisco Unity system and appear as regular email with an attached WAV file. Additionally, message recipients not in your Exchange Organization require special procedures to be entered in the Exchange directory. Specifically, they must be created manually as either Custom Recipients on the Exchange server or as address book entries in the personal address books (PAB) on local email clients such as Outlook. Fortunately, Cisco Unity has several methods for addressing these SMTP concerns that we'll look at next.

If SMTP networking is used in conjunction with the Internet Voice Connector (IVC), then the Cisco Unity-specific attributes of a voice mail will be retained as that message is prepared for transmission across the Internet. The IVC registers with Exchange to handle messages of type VOICE. When a VOICE message is sent, Exchange hands it off to the IVC, which packages the message as a MIME message that contains all of the information within it to be restored as a voice message at the receiving system. If the receiving system is another Cisco Unity with an IVC installed, then the message is handed off to the IVC and is delivered to the target subscriber with the voice message qualities intact, an MWI lamp is lit and the message is ready for pick up over the phone or at the desktop. If no IVC is available, then the message is treated as an e-mail with a WAV file attachment.

Setting Up SMTP Networking

This section gives details about the set up process for SMTP Networking.

Setting up SMTP Networking

- **Make Dial plan decisions**
- **Install IMS (Exchange 5.5)**
- **Verify SMTP connectivity**
- **Install Voice Connector (if remote subscribers are on Cisco Unity)**
- **Customize primary location object**
- **Set addressing and search options**
- **Create delivery locations (if remote subscribers are on Cisco Unity)**
- **Create Internet Subscriber accounts**

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If SMTP Networking is going to be set up between remote Cisco Unity servers then these steps must be implemented on both systems.

Many of the steps necessary for SMTP networking are similar to the ones for Digital networking with the addition of installation of the Internet Voice Connector (IVC). As before, making dial planning decisions before implementing the system will result in an installation that has no conflicting IDs to confuse those searching for subscribers' addresses. If you are implementing SMTP networking in an Exchange 5.5 environment, you will have to explicitly install the IMS as this is not done by default. In Exchange 2000 SMTP is the default message transport mechanism, so there is no need to install it there. Once this is done and you have verified connectivity, you can install the IVC if some or all of the remote sites are using Cisco Unity. You should have only one installation of the IVC in an Exchange 5.5 site or AD forest. If a previous version was installed, it must be uninstalled before continuing.

After installation of the current IVC, you customize the primary location object on the Cisco Unity server by entering a meaningful name, giving it a Dial ID, recording a voice name and, if appropriate, making it a member of a dialing domain. If you are a part of the dialing domain, the name for the domain only needs to be entered on one server. After replication, any server in the domain can pick the dialing domain name from a drop-down list. Next, enter the SMTP Domain name. If multiple Cisco Unity servers are using Digital networking, the primary location on all servers, particularly the SMTP Domain name, must be configured. Otherwise SMTP networking will not work for the subscribers on other Cisco Unity servers.

Setting addressing and search options involves the same set of considerations as in Digital networking. If some or all of the remote messaging recipients are on Cisco Unity servers, then you should create delivery locations for each of those servers. When you have multiple Cisco Unity servers networked together, it is only necessary to create those delivery locations on one server in the network. The directory holds the location data and it will be available to all who can access the directory. Creating Internet Subscribers is the last task necessary for setting up SMTP networking.

Internet Subscribers

This section describes the options for creation of Internet Subscribers in Cisco Unity.

Internet Subscribers

Send voice mail messages to any recipient with a valid SMTP address
- Recipient receives voice mail or e-mail w/WAV file attachment (target dependent)

Calls can be transferred from auto attendant or directory

Extensions optional
> Won't be listed in directory w/no extension
> Outside callers can't leave messages

Exchange 5.5 = Custom recipients

Exchange 2000/Windows 2000 = contacts

Limited access to Cisco Unity
> Voice name and greeting must be supplied for them
> No log on to Cisco Unity, no VMO or Unity Inbox
> No private lists, No message notification (from Unity) , no MWI

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Internet Subscribers are a special type of Cisco Unity voice mail user used specifically for SMTP networking and mail delivery. When you add a new subscriber in the Cisco Unity Administrator, a radio button option allows you to create an Internet Subscriber (Mailbox) and specify an SMTP address for that user. They are an Exchange Custom Recipient in Exchange 5.5 or a mail-enabled contact in Windows 2000/Exchange 2000; the Internet Subscriber is actually a mailbox that has no local message store.

When creating an Internet Subscriber, setup options relating to the local message store are not available. These options include phone password, private lists, conversation, and message notification. In other words, the mailbox acts as a pointer to the SMTP address you specify when you create the Internet Subscriber account. Both outside and internal callers benefit from the ability to address messages to the subscriber over the telephone in most cases and internal users also have an option to address to them using the GAL. The Internet Subscriber has a recorded voice name and greeting just like any other Cisco Unity subscriber; the difference is that the administrator must record the name and greeting as Internet Subscribers do not have access to Cisco Unity via the TUI or CPCA. The main difference between a regular Cisco Unity subscriber and an Internet Subscriber is that when mail is left for Internet Subscribers, the mail is delivered out the SMTP Gateway (IMS) to its Internet destination as specified within their account. The end location could be any other mail server or even another voice mail system and therefore allows off-site users to look and feel to the sender as if that recipient was actually *on-site* (i.e., field technicians or outside sales personnel).

Additionally, you can use Internet Subscribers to link offices without the need to set up messaging connectors and directory replication connectors between sites. However, the administrator must manually and individually set up Internet Subscribers for each destination location. This may be unacceptable where a large number of users exist in remote offices. For organizations with many users in various locations, Blind Addressing is typically a better choice than Internet Subscribers.

If remote subscribers are not on a Cisco Unity system, then a voice mail message sent to them will appear as an e-mail with a WAV file attachment.

Because Internet Subscribers do not have a mailbox on the Exchange system underlying Cisco Unity, there are several limitations on their use of Cisco Unity. They are not able to log on to Cisco Unity over the phone or through the Cisco Unity Assistant. Because of this they will not be able to adjust personal settings, like greetings, recorded names, message notification, or private lists. They also cannot use either ViewMail for Outlook or the Cisco Unity Inbox for the same reason.

Summary

This section summarizes the key points discussed in this lesson.

Summary

Upon completion of this chapter, you should be able to perform the following tasks:

- **Describe how Cisco Unity uses SMTP networking to deliver messages**
- **Create and use Internet Subscribers**

Next Steps

After completing this lesson, go to:

- VPIM Networking

References

For additional information, refer to these resources:

- *Networking in Cisco Unity Guide (With Microsoft Exchange)*

VPIM Networking

Lesson Overview

Voice Profile for Internet Messaging (VPIM) Networking in Cisco Unity allows different voice messaging systems to exchange voice, fax and text messages over the Internet or any TCP/IP network. This lesson will give you familiarity with both the concepts and procedures involved with VPIM networking.

Importance

If the messaging target of any of your Cisco Unity subscribers resides on a VPIM-compliant voice mail server, then it is important that you know how to set up VPIM networking to allow that messaging to take place in a transparent (to the caller) manner. This lesson reviews both the concepts and procedures needed to accomplish that task.

Objectives

Upon completing this lesson, you will be able to:

■ Describe how Cisco Unity uses VPIM networking to deliver messages

■ Create and use VPIM Subscribers

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

- An understanding of corporate messaging needs

- Knowledge of Cisco Unity messaging

- Understanding of concepts presented in the Cisco Unity Networking lesson

Outline

This lesson includes these sections:

- Overview

- VPIM Networking and VPIM Messages

- Setting Up VPIM Networking

- Locations and VPIM Networking

- Voice Connector and VPIM Networking

- VPIM Subscribers

- Summary

VPIM Networking and VPIM Messages

This section introduces the concepts involved in VPIM networking.

VPIM Networking

- **Industry-standard protocol based on SMTP and MIME**
- **Allows the exchange of voice, fax, and text messages between voice mail systems over the Internet or any TCP/IP network**
- **A licensed feature in Cisco Unity**
    - **Only one server needs to be configured for VPIM (VPIM bridgehead)**
- **List of supported VPIM systems at http://www.cisco.com/en/US/products/sw/voicesw/ps2237/prod_pre_installation_guides_list.html**
- **More information about VPIM at http://www.ema.org/vpim**

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VPIM is a digital standard based on SMTP and the Multi-purpose Internet Mail Extension (MIME) protocol. Voice, text and fax messages are transferred digitally between target servers. VPIM networking may allow organizations to save long-distance toll charges on messages between target servers because those messages are traveling over a TCP/IP network rather than more costly PSTN lines. The VPIM specification defines the format of messages and message addresses as well as the protocol for message exchange between servers. VPIM doesn't specify what client applications can be used, nor how those client applications work with their individual servers. This allows many different kinds of existing systems to support VPIM. More information about the VPIM standard is available at the URL listed in the slide above.

VPIM networking is a licensed feature of Cisco Unity. As such, only one server in an Exchange organization of multiple Cisco Unities (the VPIM bridgehead) needs to be licensed for use.

VPIM Messages

- **One or more MIME-encoded parts**
  - **Sender's spoken name**
  - **Voice, fax, and text messages**
  - **May include a vCard (electronic business card)**
- **Voice messages encoded using ITU G.726 (32-kbps ADPCM)**
- **Fax messages encoded using TIFF-F**

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VPIM messages are made up of one or more MIME-encoded parts. These parts, in addition to the voice, fax or text message, can include the sender's spoken name and possibly a vCard (an electronic business card). In Cisco Unity, you can choose whether or not the spoken name and vCard are included in an outgoing message. If a spoken name is included in an incoming message, it is included as part of the message. If a vCard is included in an incoming message, it can be looked at in ViewMail for Outlook.

VPIM voice messages are encoded using the ITU G.726 Adaptive Differential Pulse Code Modulation (ADPCM) standard and fax messages are encoded using the TIFF-F standard.

When VPIM messages are addressed, they use information from the VPIM delivery location page to format the To: address and from the VPIM location page and the primary location object page to format the From: address.

Setting Up VPIM Networking

This section describes the procedures you must follow to set up VPIM Networking.

Setting up VPIM Networking

- **Make Dial plan decisions and gather network information**
- **Verify SMTP connectivity**
- **Extend Active Directory schema**
- **Install Voice Connector and SMTP Transport Event Sink**
- **Customize primary location object**
- **Set addressing and search options**
- **Create delivery locations for each remote VPIM system**
- **Create VPIM Subscriber accounts (optional)**
- **Setup remote system for VPIM**

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Many of the steps necessary for VPIM networking are similar to the ones for Digital and SMTP networking including the installation of the IVC. As before, making dial plan decisions before implementing the system will result in an installation that has no conflicting IDs to confuse those searching for subscribers' addresses. One of the first things to do is to verify that there is SMTP connectivity between the target systems. Because VPIM uses SMTP and MIME to accomplish its tasks, SMTP connectivity is a foundation requirement. Next, extend the Active Directory schema to enable VPIM networking. The schema changes made are additions to the Cisco Unity location object class. A full description of the schema changes is listed in the file vpimgateway.ldf located in the Schema\LdifScripts directory on Cisco Unity Disc 1. Once this is done and you have verified connectivity, you can install the IVC on an Exchange 2000 server. You should have only one installation of the IVC in an AD forest. If a previous version was installed, it must be uninstalled before continuing. While you are installing the IVC, you will have the opportunity to install the SMTP Transport Event Sink. These should both be installed on the server that will receive incoming VPIM messages. If there is only one server in the organization that will be receiving VPIM messages, then this will only need to be done once. Otherwise, install it on every server that will accept incoming VPIM messages.

After installation of the current IVC, you customize the primary location object on the Cisco Unity server by entering a meaningful name, giving it a Dial ID, recording a voice name, entering the SMTP domain name, and, if appropriate, making it a member of a dialing domain. If you are a part of the dialing domain, the name for the domain only needs to be entered on one server. After replication, any server in the domain can pick the dialing domain name from a drop-down list. Next, enter the SMTP Domain name. If multiple Cisco Unity servers are using

Digital networking, the primary location on all servers, particularly the SMTP Domain name, must be configured. Otherwise SMTP networking will not work for the subscribers on other Cisco Unity servers.

Setting addressing and search options involves the same set of considerations as in Digital networking. You should create a VPIM delivery location for each remote voice-messaging server to which subscribers send messages. When you have multiple Cisco Unity servers networked together, it is only necessary to create those delivery locations on one server in the network. The directory holds the location data and it will be available to all who can access the directory. Next, create VPIM Subscribers for those persons you wish to be found from the corporate directory. Configuring the remote system for VPIM is the last task necessary for setting up VPIM networking.

Locations and VPIM Networking

This section describes the use of primary and delivery locations in VPIM networking.

Locations and VPIM Networking

- **Location data stored in SQL and in Active Directory**
  - **Data replicates to multiple Cisco Unities in same forest**
    - **Locations only need to be created on one server**
- **Primary location defines Cisco Unity characteristics**
- **Delivery locations**
  - **Correspond to each remote system**
    - **SMTP domain name for each**
    - **May contain prefix information**

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Location objects play a central role in VPIM Networking. When you install Cisco Unity, a single default location referred to as the Primary Location Object (noted as the Default Location Object when Cisco Unity is first installed) is created. As subscribers are added to Cisco Unity, they become members of this location. The Cisco Unity Administrator allows you to create additional location objects that represent additional Cisco Unity servers. If you are in the same Active Directory forest, there is no need to create additional locations, as they will be available within minutes of their creation as a default object on their home system. Location objects can be "tied" together using a property called a Dialing Domain ID. This allows you to create a meta-location that spans multiple Cisco Unity servers by assigning them all the same Dialing Domain ID. This meta-location lets you easily span sites or other networking boundaries and provide "transparent" dialing capabilities to customers that have networked telephone switches.

Recorded object data for the location object includes voice name for addressing, display name for the administrative console, three DTMF names (one for each keypad mapping), DTMF - ID for addressing, SMTP-Address (for blind addressing), destination type, send blind flag, and information about the keypad mapping used at that location. In Cisco Unity subscribers and any other system objects can only be associated with the primary location object created by the Setup program. All delivery location objects are used solely for addressing purposes.

When outside callers use the Cisco Unity directory, they are presented with a list of names that includes members of the Primary Location Object. Directory search options can be configured so that all other administrator-created delivery locations are available to all callers. Users

associated with any location object other than the default object may be added to Public and Private distribution lists or added to message address lists by subscribers only.

When defining the primary location object, you give it a Dial ID. Creating a dial plan for your organization that will result in callers reaching subscribers correctly and efficiently is very important. The Dial IDs that you create are an important part of that dial plan. Be sure that they do not conflict with previously assigned IDs.

In the Cisco Unity Administrator, all location objects will be visible, but administrators will only be able to edit/delete location objects that were created on their Cisco Unity system. Location objects that replicate from other sites will be read-only. The original location object that is installed with the system (the primary location object) can be edited but not deleted from the system.

VPIM Networking and the IVC

This section describes how the Internet Voice Connector works in VPIM Networking.

VPIM Networking and the IVC

- **Native Exchange format is MAPI**
- **Voice Connector**
  - **Converts**
    - **Outgoing MAPI to MIME format**
    - **Incoming MIME to MAPI format**
  - **Formats To and From addresses**
  - **Converts outgoing voice attachments to G.726**
  - **Can receive voice attachments in G.711, GSM 6.10 or G.726**

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Cisco Unity uses Exchange 2000, a VPIM-compliant messaging system, to provide message transport between itself and other VPIM-compliant voice messaging systems. When a message bound for a VPIM recipient is passed to the IVC (because it is registered with Exchange 2000 to handle VPIM messages), it first converts the message from Exchange's native MAPI format to MIME. It then formats the To: field with the domain name and prefix specified on the correct VPIM delivery location page. It formats the From: field with a prefix from the correct delivery location page and the primary location page's domain name. Outgoing voice messages are converted to G.726 format and then a recorded voice name and vCard, if specified, are attached. The message is then put in the SMTP pickup folder for delivery.

Incoming messages are first noticed by the event sink and readdressed to the IVC by the event sink. Once the IVC receives the message, it first verifies that the message has come from a known VPIM delivery location. If no match is made, the message is rejected and an NDR is sent to the originator of the message. If a matching delivery location is found, the IVC removes the prefixes in the To: and From: addresses, validates the recipient(s) of the message and formats the addresses and converts the message from MIME to MAPI. Any voice attachments are converted into the audio format specified on the delivery location page and the message is handed back to Exchange for delivery to the subscriber's mailbox.

VPIM Subscribers

This section describes options available and setup procedures for VPIM Subscribers.

VPIM Subscribers

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Create VPIM delivery locations first
Calls can be transferred from auto attendant or directory
Extensions mandatory
    part of the VPIM subscriber address
VPIM Subscribers are Contacts in Active Directory
    If deleting VPIM subscribers, remember to delete the underlying contact in ADUC manually
Limited access to Cisco Unity
    Voice name and greeting must be supplied for them
    No log on to Cisco Unity, no VMO or Unity Inbox
    No private lists, No message notification (from Unity) , no MWI

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VPIM subscribers, like Internet subscribers, are Cisco Unity subscribers with no mailbox storage on the Exchange Mailstore. Before creating any VPIM subscribers, you must first create the VPIM delivery locations corresponding to the server on which their mailbox resides. When you create VPIM subscribers you must specify the user mailbox number on the delivery system and the delivery location they are associated with. You must include an extension for each VPIM subscriber, though this extension does not have to match the delivery location mailbox number. VPIM subscribers are represented as contacts in Active Directory. When you delete VPIM subscribers, either by deleting individual accounts or by deleting the delivery location that accounts are associated with, remember to go into Active Directory and delete the underlying contact information, as Cisco Unity's Administrator program will not do this.

As with Internet Subscribers, any options relating to the local message store are unavailable. This means that VPIM subscribers can't log on to Cisco Unity to check or send messages, log onto Cisco Unity via the telephone or use Cisco Unity Assistant to change personal settings, own private lists, set up or receive message notification, or receive message waiting indication via Cisco Unity.

Summary

This section summarizes the key points discussed in this lesson.

Summary

Upon completion of this chapter, you should be able to perform the following tasks:

- **Describe how Cisco Unity uses VPIM networking to deliver messages**
- **Create and use VPIM Subscribers**

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Next Steps

After completing this lesson, go to:

■ AMIS Networking

References

For additional information, refer to these resources:

■ *Networking in Cisco Unity Guide (With Microsoft Exchange)*

AMIS Networking

Lesson Overview

Cisco Unity supports the Audio Messaging Interchange Specification analog (AMIS-a) protocol for the transfer of voice mail messages between AMIS compliant servers. This lesson explores the concepts underlying AMIS networking and the procedures necessary for implementing it in a Cisco Unity environment.

Importance

If your Cisco Unity networking plans call for delivery of voice messages to remote voice mail servers that support the AMIS-a protocol, then it is important for you to understand how to implement AMIS networking reliably and efficiently.

Objectives

Upon completing this lesson, you will be able to:

- Choose when a customer would appropriately use AMIS networking.

- Describe how to create and use AMIS Subscribers.

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

- An understanding of corporate messaging needs

- Knowledge of Cisco Unity messaging

- Understanding of concepts presented in the Cisco Unity Networking lesson

Outline

This lesson includes these sections:

- Overview

- AMIS Networking

- Setting Up AMIS Networking

- Port Usage and Schedules

- The UAMIS Mailbox

- AMIS Message Delivery

- Locations and AMIS Networking

- Internet Voice Connector and AMIS Networking

- AMIS Subscribers

- Summary

AMIS Networking

This section explores the basic concepts involved in AMIS networking.

AMIS Networking

- **Audio Messaging Interchange Specification (AMIS-a) analog protocol**
- **Industry-standard that allows the exchange of voice messages between voice messaging systems**
- **A licensed feature in Cisco Unity**
  - **In multiple Unity installations only one server needs to be configured for AMIS (AMIS bridgehead)**
  - **Message traffic may dictate multiple AMIS servers for load balancing**
- **White Paper: AMIS Analog Networking Definitions at http://www.cisco.com/en/US/products/sw/voicesw/ps2237/prod _technical_reference_list.html**
- **List of supported AMIS systems at http://www.cisco.com/en/US/products/sw/voicesw/ps2237/prod _pre_installation_guides_list.html**

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The Audio Messaging Interchange Specification analog (AMIS-a) protocol is an industry standard that allows the exchange of voice messages between voice messaging systems over the PSTN using standard analog telephone lines. In AMIS terms, Cisco Unity and all of the AMIS target servers that it communicates with are nodes in an AMIS network. Each node has a unique ID, its Node ID. In an AMIS message exchange, the originating node places a call to the destination node. When the destination node answers, the originating node transmits its Node ID by using a sequence of DTMF tones (touchtones). If the destination node recognizes the Node ID and accepts the call, the originating node then transmits another series of touchtones that identify which subscriber the message is for. The destination node opens a new message, the originating node plays the message, and then a series of touchtones confirming the call are exchanged. For more information on the touchtones transmitted during a call, read the White Paper referenced in the slide.

AMIS networking is a licensed feature of Cisco Unity. If you have multiple Cisco Unity servers in your organization, only one server needs to be licensed for and designated as the AMIS server. If message traffic warrants, more AMIS servers can be added to balance the load.

Example

The drawing below shows an example of AMIS networking.

Cisco Unity: AMIS-a

UCSE v1.1   4 - 54
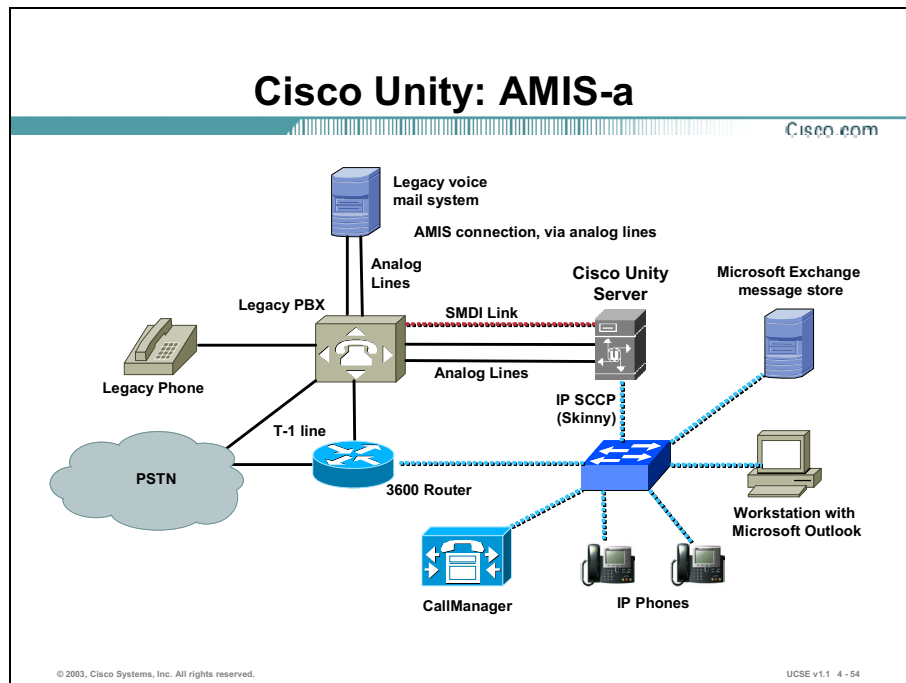
In this drawing Cisco Unity displays some of its versatility as a messaging server capable of helping an organization manage the transition from legacy telephone equipment to a converged IP network. Cisco Unity is integrated with two switches; a circuit-switched (legacy) PBX and a Cisco CallManager and can manage voice mail accounts for subscribers with either IP telephones or standard single line extensions attached to the circuit-switched PBX. In addition, through the analog lines that connect the legacy PBX and voice mail, Cisco Unity can send and receive voice mail messages using the AMIS-a protocol. In this manner an enterprise may maximize its return on its investment in older telephone equipment while migrating subscribers to an IP telephone network at the pace it dictates.

Setting Up AMIS Networking

This section details the procedures necessary to implement AMIS networking.

Setting up AMIS Networking

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- **Verify destination server is AMIS compliant**
- **Install Voice Connector**
- **For each Cisco Unity handling AMIS calls:**
  - **Create UAmis mailbox on AMIS server**
  - **Designate ports for outbound AMIS calls**
  - **Customize primary location object**
  - **Set addressing and search options**
  - **Set AMIS delivery options**
  - **Customize AMIS Restriction table**
  - **Create delivery locations for each remote AMIS system**
  - **Create AMIS Subscriber accounts**
  - **Setup remote system for AMIS**

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Many of the steps necessary for AMIS networking are similar to the ones for Digital, SMTP, and VPIM networking including the installation of the IVC. Because AMIS makes use of analog telephone lines for communication, there are some very important setup differences.

Before any other steps are taken, verify that the destination server is AMIS compliant. A list of supported AMIS servers is available at the following URL: http://www.cisco.com/en/US/products/sw/voicesw/ps2237/prod_pre_installation_guides_list.html.

One of the first things done is to install the IVC on an Exchange server. You should have only one installation of the IVC in an AD forest, Exchange site, or multi-site organization. If a previous version was installed, it must be uninstalled before continuing.

After installation of the current IVC, there are still a number of tasks to perform. If you are installing AMIS on multiple servers to handle a large volume of traffic, then these tasks must be completed on each server. First, create the UAmis mailbox on the AMIS server and designate which ports will be used for outbound AMIS calls. Next, you customize the primary location object on the Cisco Unity server by entering a meaningful name, giving it a Dial ID, recording a voice name, entering the Node ID, and, if appropriate, making it a member of a dialing domain. If you are a part of the dialing domain, the name for the domain only needs to be entered on one server

Setting addressing and search options involves the same set of considerations as in Digital, SMTP or VPIM networking. You should set AMIS delivery options for each Cisco Unity server which will deliver AMIS messages. The combination of the AMIS Schedule and the

AMIS Restriction table will determine both when and where AMIS calls will be delivered. After this create a delivery location for each remote voice-messaging server to which subscribers send messages. When you have multiple Cisco Unity servers networked together, it is only necessary to create those delivery locations on one server in the network. The directory holds the location data and it will be available to all who can access the directory. Next, create AMIS Subscribers for those persons you wish to be found from the corporate directory. Configuring the remote system for AMIS is the last task necessary for setting up AMIS networking.

Port Usage and Schedules

This section details some of the design considerations useful in setting up AMIS networking.

Port Usage and Schedules

- **AMIS transmissions can be lengthy**
  - **5 minute message takes 5 minutes plus call setup time**
    - **DTMF handshake, destination mailbox information, message length information**
  - **2 minute message to distribution list of 200 AMIS recipients = ~6.7 hours of transmit time (400+ minutes)**
- **Multiple ports can be configured to spread the load**
- **Use schedule to**
  - **Prevent port tie up during periods of high inbound activity (business hours)**
  - **Take advantage of lower long distance rates**
  - **Send urgent messages immediately**
  - **Inform users if AMIS calls happen after business hours**
- **Use restriction table to**
  - **Specify numbers for immediate delivery**
  - **Specify which numbers use AMIS schedule**

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On a Cisco Unity system used for outgoing AMIS calls you designate which ports will be used for those calls. All ports that are set to answer calls are used for inbound AMIS calls. By their nature AMIS calls can be lengthy; a five-minute message sent to a target AMIS server takes five minutes of time plus the time needed for the two servers to set up the transfer. Some of this overhead takes place with every call. A 2-minute message sent to a distribution list of 200 AMIS recipients is sent individually to each recipient. That message will take at least 6 hours and 40 minutes to successfully transmit.

If you specify multiple ports to handle outbound AMIS calls, this will spread the load out. If there are multiple messages to a single destination, the messages are grouped in batches of 9 and each batch will be sent on a different port. If multiple destinations are involved, calls will go out on separate ports to each destination.

Because AMIS transmissions can be lengthy, you can use the AMIS schedule to transmit during periods of lower system activity, generally after standard business hours. This can also have the virtue of taking place during times of lower long distance rates. AMIS messages marked as urgent can be sent immediately if you have configured the AMIS schedule appropriately. If you do configure the schedule to send messages after business hours, be sure to inform users. They may choose to send an email instead of a voice mail if the matter requires a quicker response.

The AMIS restriction table can be used to specify which delivery locations will be delivered immediately and which will use the standard AMIS schedule.

The UAmis Mailbox

This section provides details about the UAmis mailbox.

The UAMIS Mailbox

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- **Created on Exchange server partnered with Cisco Unity licensed for AMIS**
- **Storage limits initially defined by message store defaults**
  - **Sender receives NDR if mailbox at limit**
- **Storage limit considerations**
  - **Dialing restrictions and schedule**
  - **AMIS traffic spikes**
  - **Drive space limitations on Exchange server**
- **Monitor outbound traffic with AMIS Out Traffic report**
- **If you move the mailbox, restart Cisco Unity**
  - **Prevents 'stuck' messages**

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Outgoing AMIS messages are placed in the UAmis mailbox for delivery. This mailbox is created on the Exchange server associated with the Cisco Unity licensed for AMIS. Because lengthy AMIS transmissions can occupy a great deal of space, the storage limits placed on the UAmis mailbox are important. Initially, any mailbox created on an Exchange system uses the storage defaults established by the system administrator. You can change those limits on a mailbox-by-mailbox basis and probably should consider doing so for the UAmis mailbox. Items to consider include any dialing and scheduling restrictions placed on AMIS; times of day when AMIS traffic spikes occur and drive space limits on the Exchange server.

It is a good idea to monitor outbound AMIS traffic with the AMIS Out traffic report available on the Cisco Unity Administrator. You may want to do this before setting limits on the UAmis mailbox.

You can move the UAmis mailbox, just as you can move any other Exchange mailbox. If you do move the mailbox, restart the Unity system so that it reestablishes connection with the mailbox in its new location. Otherwise messages sent to the mailbox may be stuck there and not transmitted during the regularly scheduled time.

AMIS Message Delivery

This section provides details about the AMIS message delivery process.

AMIS Message Delivery

- **Messages batched by node**
  - **Nine message per batch (Unity hangs up after 9 and redials to continue delivery)**
- **Message maximum length = 8 minutes**
  - **Destination node may refuse if longer (NDR generated to sender if refused)**
- **Cisco Unity accepts inbound messages based on space available in subscriber's Inbox and Maximum Message Length on Subscriber > Messages page**
- **Inbound messages delivered to subscriber extensions only (no distribution lists)**

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Outgoing messages are batched up by node and then sent in batches of no more than 9. If there are more than 9 messages to a particular destination, Cisco Unity hangs up after 9 are delivered, waits a short period of time, then redials and continues delivery. AMIS messages can be no longer than 8 minutes. During transmission, the originating node sends the destination node the length of the message. If it exceeds the maximum, the destination node may refuse it. Cisco Unity will accept in bound AMIS messages longer than 8 minutes as long as the subscriber's Messages page allows it and the subscriber's mailbox has enough free space. Incoming AMIS messages are only delivered to subscribers and not to public distribution lists.

Locations and AMIS Networking

This section provides information about the way locations are used with AMIS networking.

Locations and AMIS Networking

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- **Location data stored in SQL and in Active Directory**
  - **Data replicates to multiple Cisco Unity servers in one forest**
    - **Locations only need to be created on one server**
- **Primary location defines Cisco Unity characteristics**
  - **Configure Dial ID and AMIS Node ID**
- **Delivery locations**
  - **One for each remote system**
    - **Delivery phone number**
    - **AMIS Node ID**

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Location objects play a central role in AMIS Networking. A Primary Location Object (initially called the Default Location Object) is created as you install Cisco Unity. As subscribers are added to Cisco Unity, they become members of this location. The Cisco Unity Administrator allows you to create additional location objects that represent additional Cisco Unity servers. If you are in the same Active Directory forest, there is no need to create additional locations, as they will be available within minutes of their creation as a default object on their home system. Location objects can be "tied" together using a property called a Dialing Domain ID. This allows you to create a meta-location that spans multiple Cisco Unity servers by assigning them all the same Dialing Domain ID. This meta-location lets you easily span sites or other networking boundaries and provide "transparent" dialing capabilities to customers that have networked telephone switches.

Recorded object data for the location object includes voice name for addressing, display name for the administrative console, three DTMF names (one for each keypad mapping), DTMF - ID for addressing, Node ID, destination type, send blind flag, and information about the keypad mapping used at that location. In Cisco Unity subscribers and any other system objects can only be associated with the primary location object created by the Setup program. All delivery location objects are used solely for addressing purposes.

When defining the primary location object, you give it a Dial ID. Creating a dial plan for your organization that will result in callers reaching subscribers correctly and efficiently is very important. The Dial IDs that you create are an important part of that dial plan. Be sure that they do not conflict with previously assigned IDs.

In the Cisco Unity Administrator, all location objects will be visible, but administrators will only be able to edit/delete location objects that were created on their Cisco Unity system. Location objects that replicate from other sites will be read-only. The original location object that is installed with the system (the primary location object) can be edited but not deleted from the system.

You must set up a delivery location for every AMIS node that Cisco Unity will exchange messages with. The delivery locations contain the Delivery Phone Number and Node ID that Cisco Unity needs to deliver messages correctly. Delivery locations only need to be created on one Cisco Unity server. After replication, the locations will be available to all servers accessing the same directory.

Internet Voice Connector and AMIS Networking

This section describes how AMIS networking uses the IVC.

IVC and AMIS Networking

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- **Use the Voice Connector for Exchange 5.5 for pure 5.5 installations**
- **Use the Voice Connector for Exchange 2000 in mixed (5.5/2000) and pure Exchange 2000 installations**
  - **In mixed environment do not use Exchange 5.5 Administrator to manage Voice Connector for Exchange 2000**
    - **Use appropriate MMC snap-in**
- **Connector registered to handle AMIS messages**
  - **Transforms outbound message properties and delivers to UAmis mailbox**

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The Voice Connector allows Cisco Unity to send and receive AMIS messages. When a message bound for a AMIS recipient is passed to the IVC (because it is registered with Exchange to handle AMIS messages), it formats the To: and From: address fields then puts it in the UAmis mailbox for delivery.

If you are using Cisco Unity in a pure Exchange 5.5 installation, then use the Voice Connector for Exchange 5.5. If your installation has a mix of Exchange 5.5 and Exchange 2000 servers, or is a pure Exchange 2000 installation, then use the Voice Connector for Exchange 2000. In a mixed environment, don't use the Exchange 5.5 Administrator program to manage the Voice Connector for Exchange 2000; use the appropriate MMC snap in.

AMIS Subscribers

This section provides information on the setup and use of AMIS subscribers.

AMIS Subscribers

- Create AMIS delivery locations first
- AMIS Subscribers associated only with delivery locations on local server
    - AMIS transmission originate from subscriber's server
- Calls can be transferred from auto attendant or directory
- Extensions mandatory
    - part of the AMIS subscriber address
- AMIS Subscribers are custom recipients in Exchange 5.5 or contacts in Active Directory
    - If deleting AMIS subscribers, remember to delete the underlying custom recipient/contact manually
- Limited access to Cisco Unity
    - Voice name and greeting must be supplied for them
    - No log on to Cisco Unity, no VMO or Unity Inbox
    - No private lists, No message notification (from Unity) , no MWI

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AMIS subscribers, like Internet and VPIM subscribers, are Cisco Unity subscribers with no mailbox storage on the Exchange Mailstore. Before creating any AMIS subscribers, you must first create the AMIS delivery locations corresponding to the server on which their mailbox resides. When you create AMIS subscribers you must specify the user mailbox number on the delivery system and the delivery location they are associated with. You must include an extension for each AMIS subscriber, though this extension does not have to match the delivery location mailbox number. AMIS subscribers are represented as contacts in Active Directory or Custom recipients in Exchange 5.5. When you delete AMIS subscribers, either by deleting individual accounts or by deleting the delivery location that accounts are associated with, remember to go into Active Directory or the Exchange 5.5 Administrator and delete the underlying contact information, as Cisco Unity's Administrator program will not do this.

As with Internet and VPIM Subscribers, any options relating to the local message store are unavailable. This means that AMIS subscribers can't log on to Cisco Unity to check or send messages, log onto Cisco Unity via the telephone or use Cisco Unity Assistant to change personal settings, own private lists, set up or receive message notification, or receive message waiting indication via Cisco Unity.

Summary

This section summarizes the key points discussed in this lesson.

Summary

Upon completion of this lesson, you should be able to perform the following tasks:

- **Choose when a customer would appropriately use AMIS networking.**
- **Describe how to create and use AMIS Subscribers.**

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Next Steps

After completing this lesson, go to:

- Bridge Networking

References

For additional information, refer to these resources:

- *Networking in Cisco Unity Guide (With Microsoft Exchange)*

Bridge Networking

Lesson Overview

Networking with the Cisco Unity Bridge provides communication between Cisco Unity and Octel voice mail servers in an Octel analog network.

Importance

If you are implementing Cisco Unity in an enterprise that currently uses Octel voice mail servers, then understanding the concepts underlying Bridge networking and being familiar with the procedures necessary to implement it will be quite important to you. This lesson provides the information you need to provide Bridge networking to your customers effectively and efficiently.

Objectives

Upon completing this lesson, you will be able to:

■ Choose when a customer would appropriately use the Unity Bridge.

■ Describe how to create and use Bridge Subscribers.

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

- An understanding of corporate messaging needs

- Knowledge of Cisco Unity messaging

- Understanding of concepts presented in the Cisco Unity Networking lesson

Outline

This lesson includes these sections:

- Overview

- Bridge Networking

- Setting Up Bridge Networking

- The UOmni Mailbox

- Bridge Message Translation

- Locations and Bridge Networking

- Voice Connector and Bridge Networking

- Bridge Subscribers

- Summary

Bridge Networking

This section describes the basic concepts involved in Bridge Networking.

Bridge Networking

- **Cisco Unity Bridge**
  - **Gateway between Cisco Unity and Octel node on Octel analog network**
- **Bridge communicates with**
  - **Octel node using Octel analog protocol**
  - **Cisco Unity using Digital networking (VPIM w/proprietary extensions)**
- **A licensed feature in Cisco Unity**
  - **In multiple Unity installations only one server needs to be configured for Bridge (a Bridge bridgehead)**
  - **Message traffic may dictate multiple Bridge servers for load balancing**
- **List of supported Octel systems at http://www.cisco.com/en/US/products/sw/voicesw/ps2237/prod _pre_installation_guides_list.html**

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Cisco Unity Bridge acts as a gateway between Cisco Unity and an Octel node on an Octel analog network. To the rest of the Octel analog network, the Bridge appears as just another node, in much the same manner as Cisco Unity using AMIS appears as another node on an AMIS network. As a gateway, the Bridge translates messages between two different protocols. It communicates with an Octel node by placing a phone call and then using the Octel analog protocol; it communicates with Cisco Unity using the Digital Networking protocol, which is based on VPIM with some proprietary extensions for added functionality. Messaging between Cisco Unity and the Bridge is done over the Internet or any TCP/IP network using SMTP.

Bridge networking is a licensed feature of Cisco Unity. In addition to the separate Bridge server, you must also license Cisco Unity to communicate with it. If you have multiple Cisco Unity servers in your organization, only one server needs to be licensed for and designated as the Bridge server. If message traffic warrants, more Bridge servers can be added to balance the load. Bridge servers exist in a one-to-one relationship with Cisco Unity servers.

A list of supported Octel systems is available at the URL cited in the slide.

Bridge Networking Examples

The following two slides illustrate how the Unity Bridge can be implemented in an enterprise's messaging infrastructure.

Cisco Unity Bridge with Dual Integration
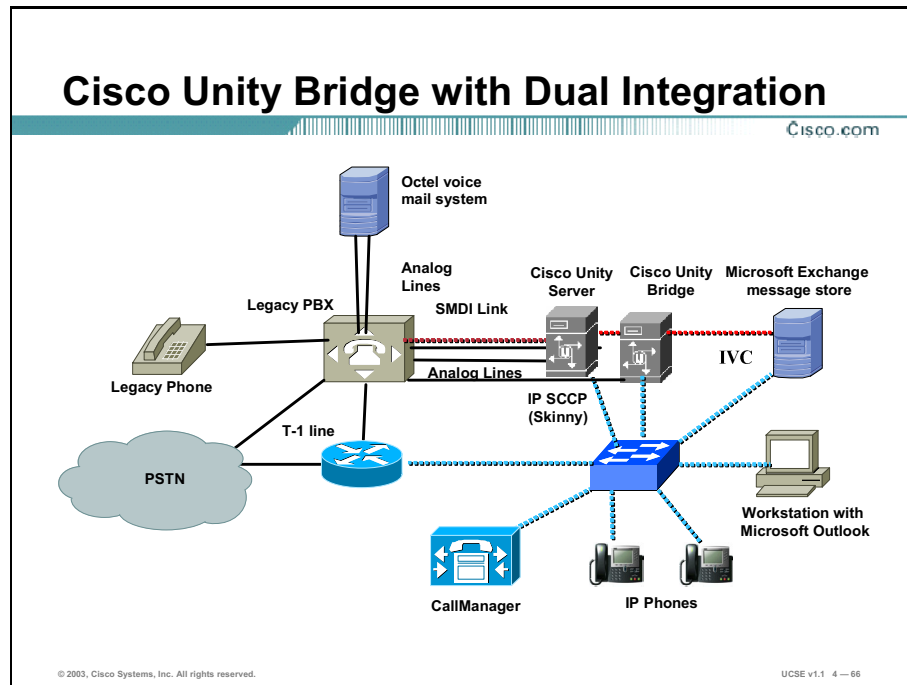
Cisco Unity coupled with Cisco Unity Bridge is a messaging server combination capable of helping an organization manage the transition from legacy telephone equipment to a converged IP network. Cisco Unity is integrated with two switches; a circuit-switched (legacy) PBX and a Cisco CallManager and can manage voice mail accounts for subscribers with either IP telephones or standard single line extensions attached to the circuit-switched PBX. In addition, through the analog lines that connect the legacy PBX and voice mail, Cisco Unity Bridge can send and receive voice mail messages using Octel's analog messaging protocol. In this manner an enterprise may maximize its return on its investment in older telephone equipment while migrating subscribers to an IP telephone network at the pace it dictates.

Cisco Unity Bridge with Cisco CallManager

Octel voice mail system

Analog Lines

Cisco Unity Server

Cisco Unity Bridge

Microsoft Exchange message store

Legacy PBX

Legacy Phone

Analog Lines

IVC

IP SCCP (Skinny)

T-1 line

PSTN

Workstation with Microsoft Outlook

CallManager

IP Phones
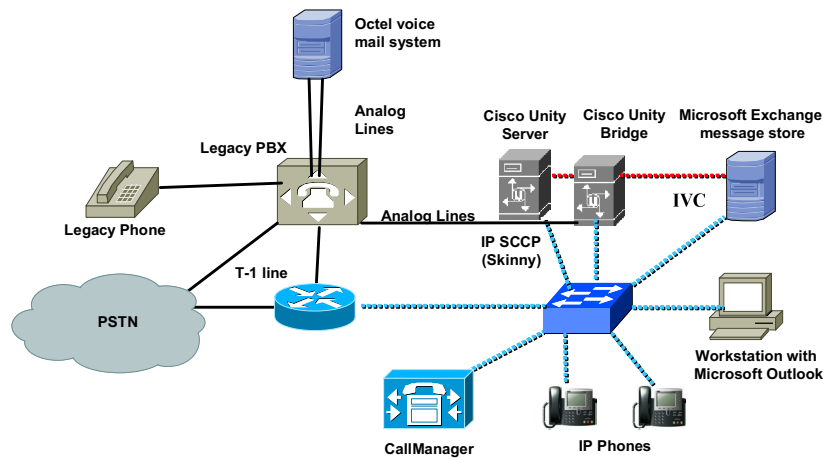
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In this design, Cisco Unity is providing messaging services to subscribers being served by CallManager and a circuit-switched PBX is providing voice mail service to subscribers on an Octel system. Cisco Unity Bridge is helping the organization manage the transition from legacy telephone equipment to a converged IP network. Through the analog lines that connect the legacy PBX and voice mail, Cisco Unity can use the Unity Bridge to send and receive voice mail messages using Octel's analog messaging protocol.

Setting Up Bridge Networking

This section provides information on the procedures necessary for setting up Bridge Networking in Cisco Unity.

Setting up Bridge Networking

- Make decisions on dial plan and gather information
- Provide network connectivity between Exchange server w/Voice Connector and Unity Bridge
- Extend Active Directory schema for Bridge delivery locations
- Configure SMTP options
- Install Voice Connector on an Exchange 2000 server
- Create UOmni mailbox on Cisco Unity bridgehead server
- Customize primary location object
- Set addressing and search options
- Set Bridge subscriber creation and synchronization options
- Create delivery locations for each remote Octel system
- Create Bridge Subscriber accounts (optional)
- Setup remote system(s) with Bridge's Octel node information

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Many of the steps necessary for Bridge networking are similar to the ones for Digital, SMTP, VPIM, and AMIS networking including the installation of the IVC. Because Bridge makes use of analog telephone lines for communication, there are some very important setup differences.

Before any other steps are taken, be sure the server meets the requirements in the *Cisco Unity Bridge System Requirements, and Supported Hardware and Software*, available at the following URL:
http://www.cisco.com/en/US/products/sw/voicesw/ps2237/prod_pre_installation_guides_list.html.

As before, making dial plan decisions before implementing the system will result in an installation that has no conflicting IDs to confuse those searching for subscribers' addresses. Next, provide network connectivity between the Exchange server that will have the IVC installed on it and the Unity Bridge. Then, extend the Active Directory schema to enable Bridge networking. The schema changes made are additions to the Bridge delivery location object class. A full description of the schema changes is listed in the file vpimgateway.ldf located in the Schema\LdifScripts directory on Cisco Unity Disc 1. Next, you may need to grant the Bridge server permissions to relay e-mail through the Exchange SMTP virtual server and you may need to configure an SMTP connector to route messages to the Bridge. Once this is done, you can install the IVC on an Exchange 2000 server. You should have only one installation of the IVC in an AD forest. If a previous version was installed, it must be uninstalled before continuing.

After installation of the current IVC, there are still a number of tasks to perform. If you are installing Bridge Networking on multiple servers to handle a large volume of traffic, then these tasks must be completed on each server. First, create the UOmni mailbox on the Cisco Unity bridgehead server. Next, you customize the primary location object on the Cisco Unity server by entering a meaningful name, giving it a Dial ID, recording a voice name, entering the Node ID (this Node ID must match the serial number on the Unity nodes page in the Bridge Administrator), enter the fully qualified domain name of the Bridge server, and, if appropriate, making it a member of a dialing domain. If you are a part of the dialing domain, the name for the domain only needs to be entered on one server

Setting addressing and search options involves the same set of considerations as in Digital, SMTP, VPIM, or AMIS networking. At this point you will set Bridge subscriber creation and synchronization options. After this create a delivery location for each remote Octel system to which subscribers send messages. Optionally, you may want to change the standard messaging menu conversation or the default display name-parsing rule. Next, you may want to create Bridge Subscribers for those persons you wish to be found from the corporate directory on a permanent basis. If the Bridge will be joining an Octel network as a new node then configuring the remote Octel systems to recognize the new node is the last task necessary for setting up Bridge networking.

The UOmni Mailbox

This section provides information about the UOmni mailbox on the Cisco Unity system.

The UOmni Mailbox

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- **Created on Exchange server partnered with Cisco Unity licensed for Unity Bridge**
- **Storage limits initially defined by message store defaults**
- **Used for administrative messages from Bridge to Unity to create, modify or delete Bridge subscribers in Cisco Unity**
- **If you move the mailbox after creation, restart Cisco Unity**
  - **Prevents 'stuck' messages**

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The UOmni mailbox is created on the Exchange server partnered with the Cisco Unity that is licensed for Unity Bridge. The mailbox will initially take whatever message storage limits are defined in the Exchange system. It is likely that these limits will be acceptable as the function of the UOmni mailbox is to accept administrative messages from the Bridge to Cisco Unity. These messages concern the automatic creation, modification, or deletion of Bridge subscribers in Cisco Unity that happen as a result of Octel NameNet emulation. Octel's NameNet is the feature that allows nodes to obtain new entries from directories on other nodes. When a message is sent to a node by a 'new' subscriber, the node will request display name and recorded name information and will then add that information to its directory. Unity Bridge emulates that behavior and then passes the messages on to Cisco Unity via the UOmni mailbox.

If you do move the UOmni mailbox after it has been created, be sure to stop and restart Cisco Unity so it will be aware of UOmni's new location. Otherwise, messages may get stuck in the mailbox.

Bridge Message Translation

This section describes how the Unity Bridge performs it gateway translation functions.

Bridge Message Translation

- **Maintains two tables**
  - **Octel node table**
    - **Octel server name**
    - **Unique serial number**
    - **Telephone number**
  - **Cisco Unity table for Octel nodes**
    - **Unity server name**
    - **Assigned serial number**
    - **Domain name**
- **Uses appropriate table to look up routing information when receiving messages**

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The Cisco Unity Bridge delivers fax and voice messages between servers that use differing protocols. As a result the Bridge must translate the messages coming to it into the form the receiving server expects to see. To do this it maintains two tables: one for the Octel node(s) that contains the server name, unique Octel serial number and telephone number of each Octel node it communicates with; the second is a Cisco Unity table that contains the Unity server name, assigned serial number and its domain name. Using these two tables, it can receive a message from either type of node, Octel or Cisco Unity, look up the address, reformat the information into the desired form and then send the message to its destination.

Locations and Bridge Networking

This section presents information about the use of locations in Bridge networking.

Locations and Bridge Networking

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- **Location data stored in SQL and in Active Directory**
  - **Data replicates to multiple Cisco Unities in same forest**
    - **Locations only need to be created on one server**
- **Primary location defines Cisco Unity characteristics**
  - **Configure Dial ID, Octel Node ID, Bridge server address**
- **Delivery locations**
  - **Created only on Cisco Unity that communicates with Bridge**
  - **One for each remote system**
    - **Specify Destination Type as Bridge during creation**

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Location objects play a central role in Bridge Networking as it does in all of the other forms of networking. Cisco Unity Administrator allows you to create additional location objects called delivery locations that represent additional target servers. If you are in the same Active Directory forest, there is no need to create additional locations, as they will be available within minutes of their creation as a default object on their home system. Location objects can be "tied" together using a property called a Dialing Domain ID. This allows you to create a meta-location that spans multiple Cisco Unity servers by assigning them all the same Dialing Domain ID. This meta location lets you easily span sites or other networking boundaries and provide "transparent" dialing capabilities to customers that have networked telephone switches.

The important object data for the primary location object on a Cisco Unity server used in Bridge networking includes Node ID (this Cisco Unity server's ID on the Octel analog network), Dial ID (identifies this location to Cisco Unity), and Server Address (the fully qualified domain name of the Bridge server with which Cisco Unity is associated). When defining the primary location object, you give it a Dial ID. Creating a dial plan for your organization that will result in callers reaching subscribers correctly and efficiently is very important. The Dial IDs that you create are an important part of that dial plan. Be sure that they do not conflict with previously assigned IDs.

Delivery locations in Bridge networking are created for each Octel system to which subscribers will send messages. You select Bridge as the destination type during creation, record a voice name for the location, and enter the Octel Node ID (this number must match the number on the Octel node and must match the one recorded in the Bridge Administrator).

Voice Connector and Bridge Networking

This section describes the working of the IVC with Bridge networking.

Voice Connector and Bridge Networking

- **Use Voice Connector for Exchange 2000**
- **Connector registered to handle OMNI address type**
    - **Transforms outbound messages to VPIM and delivers via SMTP to Bridge**
    - **Transforms inbound messages from VPIM to voice message and hands off to Cisco Unity**

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The Voice Connector allows Cisco Unity to send messages to and receive messages from the Bridge. When a message bound for a Bridge recipient is passed to the IVC (because it is registered with Exchange to handle OMNI messages), it transforms the message into the proprietary VPIM format and delivers it to the Bridge via SMTP. Incoming messages are transformed from the VPIM format into voice messages and handed off to Exchange for delivery.

The Voice Connector for Exchange 2000 is the only one supported for use with Unity Bridge. If your installation has a mix of Exchange 5.5 and Exchange 2000 servers, or is a pure Exchange 2000 installation, then use the Voice Connector for Exchange 2000. In a mixed environment, don't use the Exchange 5.5 Administrator program to manage the Voice Connector for Exchange 2000. Use the appropriate MMC snap in.

Bridge Subscribers

This section describes the options available for Bridge Subscribers in Cisco Unity.

Bridge Subscribers

Representation of Octel subscribers on Cisco Unity

Create Bridge delivery locations first

Bridge Subscribers created

    Automatically w/usage-based NameNet emulation

    Manually in Cisco Unity

    Permanently on Bridge

        Automatically creates Bridge subscriber on Unity

Creation, update, and deletion flows from Bridge to Cisco Unity

- Never the reverse

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Bridge subscribers, like Internet, AMIS, and VPIM subscribers, are Cisco Unity subscribers with no mailbox storage on the Exchange mailstore. They are a representation on the Cisco Unity system of subscribers on the Octel system. Before creating any Bridge subscribers, you must first create the Bridge delivery locations corresponding to the Octel node on which their mailbox resides.

Bridge subscribers can be created in a number of ways. They can be created automatically through usage-based NameNet emulation, permanently on the Unity Bridge, or manually in Cisco Unity. When entries are created, updated, or deleted via NameNet emulation or permanently at the Bridge, that information flows from the Bridge to Cisco Unity.

Bridge Subscribers

Calls can be transferred from auto attendant or directory

Contacts in Active Directory

> If deleting Bridge subscribers from Cisco Unity Administrator, remember to delete the underlying contact manually

> If deleting on Bridge server using Bridge Administrator or using Bridge Mailbox Import tool, Bridge subscriber **and** AD contact are deleted

Limited access to Cisco Unity

> Voice name and greeting must be supplied for them

> No log on to Cisco Unity, no VMO or Unity Inbox

> No private lists, No message notification (from Unity) , no MWI

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If you create Bridge subscribers manually, you specify the remote user mailbox number on the delivery system and the delivery location they are associated with. You must include an extension for each Bridge subscriber, though this extension does not have to match the delivery location mailbox number. Bridge subscribers are represented as contacts in Active Directory. When you delete Bridge subscribers, either by deleting individual accounts or by deleting the delivery location that accounts are associated with, remember to go into Active Directory and delete the underlying contact information, as Cisco Unity's Administrator program will not do this.

As with Internet, AMIS, and VPIM Subscribers, any options relating to the local message store are unavailable. This means that Bridge subscribers can't log on to Cisco Unity to check or send messages, log onto Cisco Unity via the telephone or use Cisco Unity Assistant to change personal settings, own private lists, set up or receive message notification, or receive message waiting indication via Cisco Unity.

Summary

This section summarizes the key points discussed in this lesson.

Summary

Upon completion of this lesson, you should be able to perform the following tasks:

- **Choose when a customer would appropriately use the Unity Bridge.**
- **Describe how to create and use Bridge Subscribers.**

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Next Steps

After completing this lesson, go to:

- Networking Cisco Unity Lab

References

For additional information, refer to these resources:

- *Cisco Unity Bridge Networking Guide*

Unified Communications Maintenance and Utilities

Module Overview

This module will cover suggested maintenance procedures and system utilities used to service an efficiently running Cisco Unity or Personal Assistant system. We discuss recommended maintenance procedures and investigate various utilities in the systems. We discuss troubleshooting procedures to help diagnose any issues with either the Cisco Unity or Personal Assistant system.

Upon completing this module, you will be able to:

- Describe the recommended maintenance procedures for Cisco Unity

- Describe the utilities and their functions in Cisco Unity

- Describe troubleshooting procedures for Cisco Unity

- Describe troubleshooting procedures for Cisco Personal Assistant

Outline

The module contains these lessons:

- Cisco Unity Maintenance and Backup

- Cisco Unity Administration Tools

- Cisco Unity Audio Management Tools

- Cisco Unity Diagnostic Tools

- Cisco Unity Reporting Tools

- Cisco Unity Switch Integration Tools

- Personal Assistant Troubleshooting and Monitoring

Cisco Unity Maintenance and Backup

Lesson Overview

This lesson discusses the recommended maintenance and backup procedures for a Cisco Unity system.

Importance

Cisco Unity in unified messaging or voice mail only mode requires regular maintenance to ensure an efficient system. Knowing the procedure for backup of the Cisco Unity is an important component of maintaining a Cisco Unity system.

Objectives

Upon completing this lesson, you will be able to:

■ Describe Cisco Unity maintenance procedures

■ Describe Cisco Unity backup procedures

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

- Knowledge of basic troubleshooting

- Knowledge of Cisco Unity unified messaging and voice mail configurations

Outline

This lesson includes these sections:

- Overview

- Cisco Unity Maintenance

- Cisco Unity Additional Maintenance Resources

- Cisco Unity Backup

Cisco Unity Maintenance

This section covers Cisco Unity maintenance.

Recommended Maintenance for Cisco Unity

- **Forward unaddressed messages to the appropriate recipients**
- **Scan for viruses**
- **Keep virus-scanning definitions up to date**
- **Check for Exchange mailboxes that are over their storage limit**
- **Run Exchange Optimizer on Exchange 5.5 when more than 100 subscribers are added**

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All of the software and hardware associated with the Cisco Unity server requires maintenance to ensure high performance. Degradation in any piece of the installed software can affect server performance. Performing regular maintenance on the Cisco Unity server can assure continuous reliability and performance.

Messages that cannot be delivered are returned to the Unaddressed Messages distribution list. They could arrive there because the network or a home Exchange server assigned to a subscriber is down, or because the subscriber mailbox is full, or messages left in the Operator call handler when an operator may not be available. These messages should be forwarded from the Unaddressed Messages list to their proper recipient. By default however, the only member of the Unaddressed Messages distribution list is the Example Administrator. It is important that someone whose responsibility it is to monitor the system for undelivered messages be added to this distribution list. This person should have no message storage limit on their mailbox.

Virus scanning on a daily basis is recommended. This should be scheduled for off hours when the Cisco Unity server is less busy.

The virus-scanning software for Cisco Unity should be regularly updated with new virus-scanning definitions. A list of virus-scanning software that has been qualified for use with Cisco Unity can be found at:
http://www.cisco.com/univercd/cc/td/doc/product/voice/c_unity/sysreq/index.htm

Recommended Maintenance (cont).

- **Keep up to date with Cisco Unity qualified service packs and hot fixes.**
- **Twice a year run Exchange Eseutil utility from Microsoft (see http://support.Microsoft.com)**
- **Back up Cisco Unity and Message Stores regularly**
- **Include Cisco Unity Servers in schedule if restarting other network servers**
- **Run dbWalker Utility**

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Microsoft frequently provides updates for Windows 2000, Exchange, SQL Server 2000/MSDE 2000, Internet Explorer, and Microsoft IIS. These updates (referred to as security updates, patches, or hot fixes) are limited to changes that fix specific problems. They do not include general defect fixes or new functionality. Cisco TAC provides support for Cisco Unity systems on which of these updates have been qualified for use.

Microsoft also occasionally releases service packs, that contain fixes generated since the general product release. Because the service pack scope is broad, each service pack must be thoroughly tested to ensure that changes do not adversely affect Cisco Unity. Cisco TAC does not support new service packs until they have been qualified for use with Cisco Unity.

Do not install a service pack that has not been qualified, or Cisco TAC will not help you resolve problems until you have uninstalled that service pack.

For information on which service packs have been qualified for use with Cisco Unity, refer to *Cisco Unity Requirements, and Supported Hardware and Software,* available on Cisco.com at http://www.cisco.com/univercd/cc/td/doc/product/voice/c_unity/sysreq/index.htm

The Microsoft Exchange Eseutil is a defragmentation utility for use with Microsoft Exchange. This utility helps to keep Exchange running efficiently. It may however take a long time to complete. It should be run on a regular schedule at least once every six months.

Running Dbwalker will ensure the integrity of the Cisco Unity database. The Dbwalker utility will check for unassociated (orphaned) call handlers, and invalid links caused by not removing all references to deleted call handlers in the database. If these are left unattended they could cause instability in the Cisco Unity server and system lockups. They will affect any attempt to restore a database made from a backup of a corrupted database.

Cisco Unity Additional Maintenance Resources

This section discusses additional information on maintaining Cisco Unity.

Additional Maintenance Resources

Cisco.com

- **White Papers :**
  - **Maintaining a Cisco Unity System**
  - **Security Best Practices for Cisco Unity**
  - **Backing Up and Restoring a Cisco Unity System**
- **http://www.cisco.com/univercd/cc/td/doc/product/voice/c_unity/whitpapr/index.htm**

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These are some additional resources to access for information on maintaining your Cisco Unity system. The information contained in these three white papers, as well as many of the others there, goes into much greater depth about the topics than has been covered here. The URL above takes you to a listing of all of the currently available white papers from the Enterprise Communication Software Business Unit (ECSBU), the people who produce Unity within Cisco Systems, Inc. New white papers are added as necessary topics are discovered, researched and written about. Check the address regularly for new and updated information.

Cisco Unity Backup

This section discusses the recommended Cisco Unity backup process.

Backing up a Cisco Unity System

- **Server preparation – See System Administration Guide**
  - **Circular Logging "OFF"**
  - **Schedule backups during off peak hours**
- **Cisco Unity standard Backup - use Backup Exec**
  - **Cisco Unity**
  - **OS**
  - **Exchange (Domino) Information Store and Directory**
  - **Exchange (Domino) Mailboxes**
  - **SQL**
  - **System State**

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A backup strategy that provides a schedule for performing full backups is essential for restoring Cisco Unity quickly if the system goes down. If your organization does not have a backup strategy as part of its disaster recovery plan for Exchange, refer to the documentation provided by the backup software that is used at your site and to the appropriate documentation available on the Microsoft web site to develop one.

If your organization does not have already have a software package for performing scheduled backups, you can use Backup Exec, a data management program from the VERITAS Software Corporation, to back up the Cisco Unity server. For technical assistance with Backup Exec, contact the VERITAS Software Corporation

The best time to perform a backup is when the Cisco Unity server is not busy: when Cisco Unity is not processing many calls (for example, after the end of the regular business day), or when there are no other processes running (for example, when the system is not generating reports).

Note that customized Cisco Unity call routing rules are not included in the backup files. If you ever need to restore your system, you must recreate such call routing rules manually by using the Cisco Unity Administrator. You can use the listing on the slide to guide you with what items to backup on the Cisco Unity server with Backup Exec. Note that if Cisco Unity is installed on a domain controller or a domain controller/global catalog server, you need to take additional steps to back up the Active Directory. Refer to the Microsoft Web site for information about restoring the Active Directory.

Summary

This section summarizes the key points discussed in this lesson.

Summary

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Upon completion of this lesson, you should be able to perform the following tasks:

- **Describe recommended maintenance for Cisco Unity**
- **List where to find additional resources for maintenance issues**
- **Describe Cisco Unity backup information**

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Next Steps

After completing this lesson, go to:

■ Cisco Unity Administration Tools

References

For additional information, refer to these resources:

■ Cisco Unity White Papers

— Maintaining a Cisco Unity System

— Backing Up and Restoring a Cisco Unity

— Security Best Practices for Cisco Unity

— Available at:
http://www.cisco.com/univercd/cc/td/doc/product/voice/c_unity/whitpapr/index.htm

Cisco Unity Administration Tools

Lesson Overview

In this lesson we discuss the Administration Tools located in the Tools Depot of Cisco Unity. The Administration Tools are used in importing different types of users into the system, upgrading the system, disaster recovery, and changing some registry settings.

Importance

Cisco Unity Administration tools are important for maintaining and, at times, troubleshooting a Cisco Unity system. Familiarity with these tools makes maintenance of the Cisco Unity system much easier.

Objectives

Upon completing this lesson, you will be able to:

■ Describe the function of Cisco Unity Administration Tools

■ Describe the use of Status Monitor

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

■ Knowledge of Cisco Unity unified messaging and voice mail configurations

Outline

This lesson includes these sections:

■ Overview

■ Cisco Unity Audio Text Manager

■ Cisco Unity Bulk Edit Utility

■ Cisco Unity Disaster Recovery Backup and Restore

■ Cisco Unity Migrate Subscriber Data Utility

■ Cisco Unity License Viewer

■ Cisco Unity Global Subscriber Manager

■ Status Monitor

■ Summary

Cisco Unity Audio Text Manager

This sections describes the Cisco Unity Audio Text Manager.
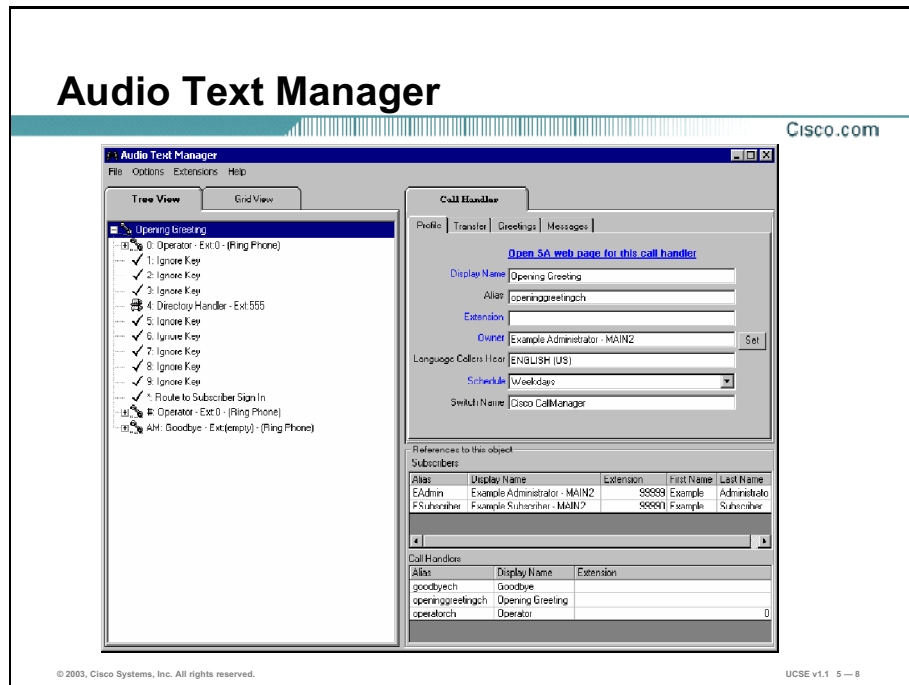
The Audio Text Manager is designed to give you a fast, graphical view of the flow patterns of call handlers configured in the Cisco Unity database and allows you to modify that flow quickly and easily. This is particularly useful for systems with complicated Audio Text applications with many call handlers. It can be especially useful for troubleshooting an audio text application.

You can see the information in the Audio Text Manager in either Tree View or Grid View. Tree View is shown in the screenshot on the slide above. On the right side of the window the tabs allow you to view most of the information that is available to an administrator in the System Administrator.

Bulk Edit Utility

This section discusses the Cisco Unity Bulk Edit Utility.
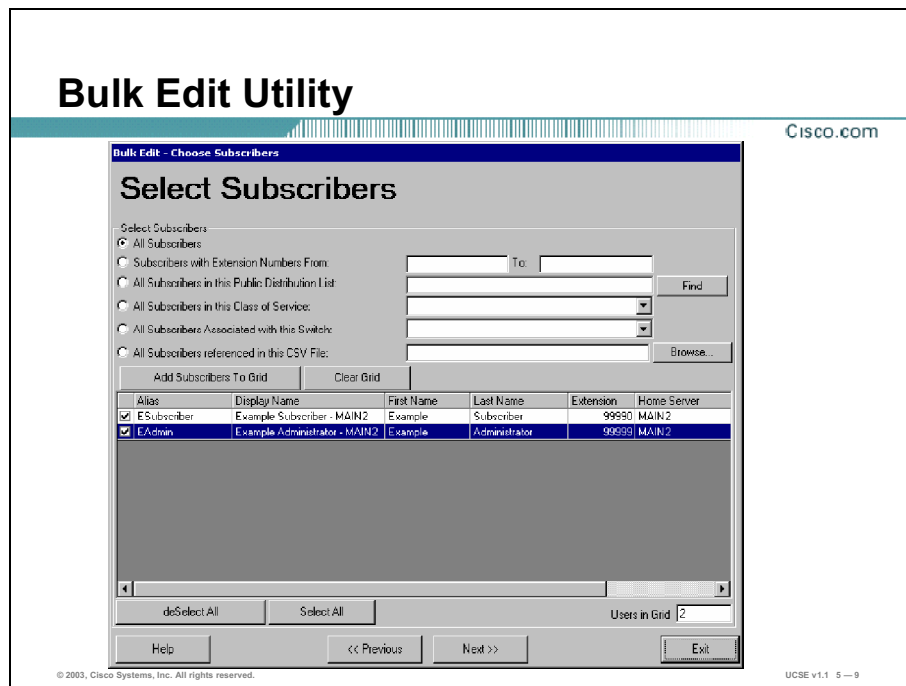
Bulk Edit Utility

The Cisco Unity Bulk Edit Utility is designed to allow you to select large numbers of call handlers or subscribers and make changes to them quickly and easily. Nearly every value you can see and edit via the System Administrator (SA) is available to change en mass using Bulk Edit as well as a few items not visible in the SA. There is no "undo" capability in the utility. In other words if you were to use the Bulk Edit Utility and then realized you had changed the wrong field or entered the incorrect change, you would either have to run the Bulk Edit Utility again to correct or edit each mailbox individually through the SA.

It is possible to look at a list of all subscribers on the Cisco Unity system as well as subsets of them. You can use the tool to edit a range of subscribers with any specified starting and stopping extension, all subscribers on a particular distribution list or class of service, all subscribers attached to a particular telephone switch (in a dual switch integration), or all of the subscribers referenced in a supplied CSV file.

Disaster Recovery Backup and Restore

This section looks at the Disaster Recovery Backup and Restore Utilities

The Unity Disaster Recovery Backup tool captures all Unity specific data from a server so that it can be restored using the Unity Disaster Recovery Restore tool. This is useful for disaster recovery purposes using regular scheduled backups or for migration purposes.

The disaster recovery tools are intended as a mechanism to backup all Unity specific data from a server and store it on a network drive off box. In the event of a catastrophic failure of the server, the customer must rebuild it up to the point where Unity is running as a clean freshly installed system. At that point they can run the restore utility to bring their server back up to the point where the last backup had been done. You must install the same version of Unity that you did the backup from and you need to get it to the point where it's up and running. If you're connecting to Call Manager, you also need to configure your TSP to talk to the CM ports. Once you have the system working as a new, clean install, you can perform the restore operation.

The information preserved includes all Unity objects and data, greetings, voice names, routing rules, switch configuration, etc. It is important to note, however, this tool does NOT backup the message store at all. You must use an Exchange-aware backup product such as BackupExec or the built-in backup tools that come with Win2K and Exchange to get your message store information.

The disaster recovery tool is ideal for sites that have installed Unity in a Unified Messaging configuration and users are homed off box. Typically, sites will already have Exchange backup procedures in place and want a way to quickly and easily backup and restore the Unity specific configuration information without having to backup the entire Unity server. This is also useful for sites that want to upgrade the server Unity is running on or would like to change the

partition configuration and/or where Unity is installed. The Restore tool will handle that on the fly.

There are some caveats which are important to remember. The Disaster Recovery Backup Utility works only in an Exchange environment, not Domino. The backup gathered can only be restored to a like system. In other words, taking a Unity 3.1(1) database backup and trying to restore it to a Unity 3.1(5) or 4.0 will not work.

Migrate Subscriber Data Utility

This section describes the Migrate Subscriber Data Utility.
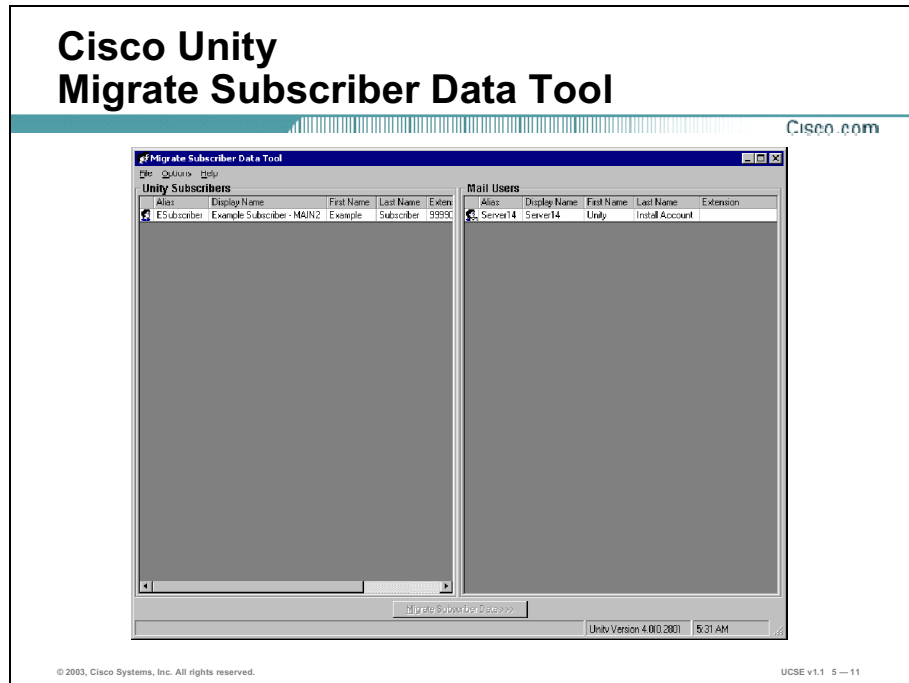
The Migrate Subscriber Data tool allows the Cisco Unity administrator to move subscriber settings from a Cisco Unity subscriber account to a mail user account. Use of this tool allows you to preserve all of the subscriber settings such as voice name, greetings, private distribution lists, and so on, because these Cisco Unity-specific attributes are added to the mail user account attributes. The tool is useful for moving from a voicemail-only installation to unified messaging, or for migrating users from another voicemail system to Cisco Unity (for example, migrating Octel users who have been set up as Bridge subscribers).

For example, imagine you have created two directory accounts for each employee. One account is used for voice mail messages (vJSmith) and the other is used for e-mail (JSmith), and now it's time to move John's voice mail account. You bring up the Migrate Subscriber Data tool and select John's subscriber account and his e-mail account, and click the Migrate Subscriber Data button. The result is that John's subscriber record is modified; his e-mail account directory ID is copied over his voicemail directory ID. His alias, display name, and first and last name are also transferred from his e-mail account to his subscriber record. His primary call handler alias is modified to match his alias. These modifications take place within the Cisco Unity database, not the directory. His previous subscriber directory account is modified to remove the subscriber-specific settings, but the directory account is not deleted. When you exit the tool, the Cisco Unity database is synchronized with the directory. When the directory synchronization is complete, any new voice mail messages John receives will be delivered to his e-mail account.

License Viewer Utility

This section shows the License Viewer utility.

Cisco Unity License Viewer

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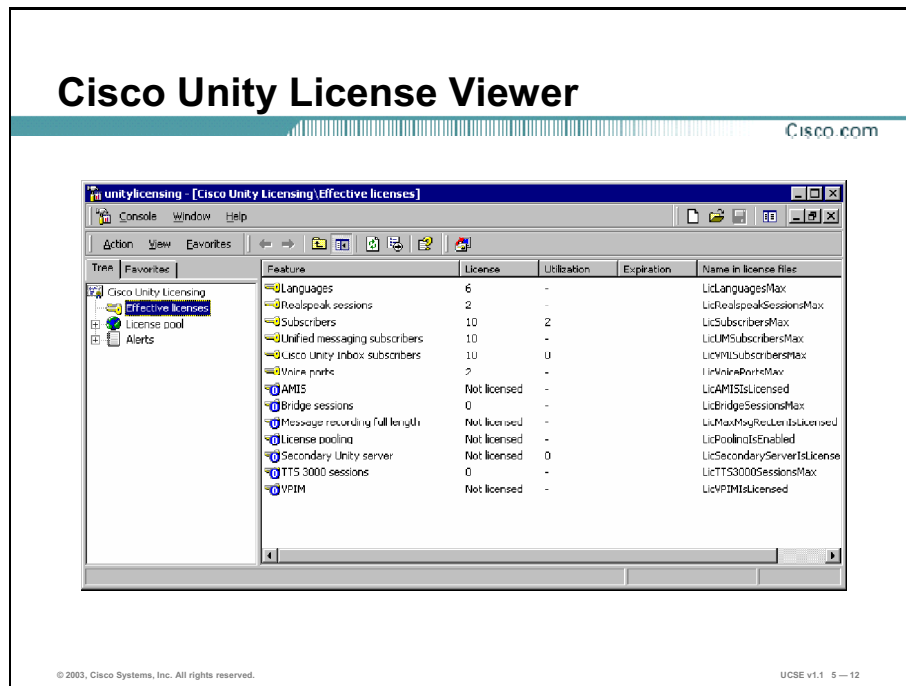
The License Viewer Utility is a handy way to see the current licenses for your Cisco Unity system. The FlexLM licensing controls many aspects of your Cisco Unity configuration such as how many languages you are allowed, voice ports, Text-to-Speech sessions, etc. If you try to install a new feature or add another langauge and the system does not allow you, it may be because you are not licensed for it. In this case you would need to purchases additonal licenses . When you receive the new license file you would run the License wizard and then as a check, look at the License Viewer to confirm your new licenses are active.

Global Subscriber Manager

This section discusses the Global Subscriber Manager.
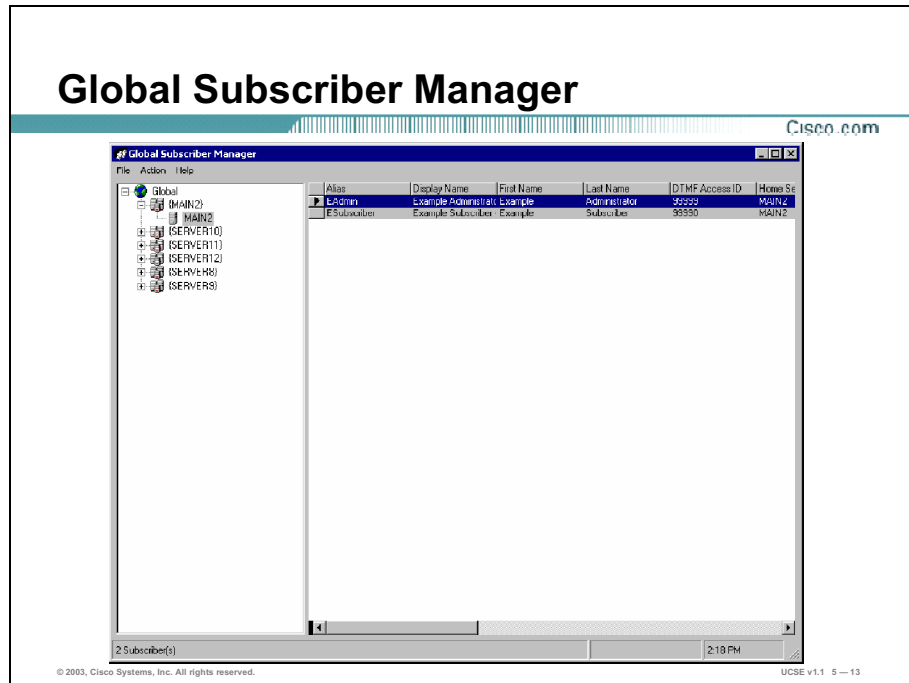
The Global Subscriber Manager (GSM) shows your entire Cisco Unity network broken down by dialing domains and servers. The GSM allows the administrator to quickly locate individual subscribers and, by double-clicking on the subscriber, launch the SA page for that subscriber regardless of which server they are homed on. The administrator can select any scope they want and see all of the subscribers at that level. Searching can be done by dialing domain, server or globally across the entire Cisco Unity network.

The GSM displays your Cisco Unity network in a tree organized by dialing domains and servers. The top of the Cisco Unity network is the Global directory. Under the Global directory will be a node for each Dialing Domain (DD). Under each DD will be a node for each server within that DD. If a Cisco Unity server doesn't belong to a dialing domain it will show up at the DD level with its name surrounded in curly brackets {}.

Clicking on any node in the tree will show All Subscribers at that level. For example, clicking on a DD will show all subscribers homed on any server that is a member of that DD. Clicking on the Global node will show all subscribers in your entire Cisco Unity network.

Once you have located the subscriber you want to view in more detail or edit, you just double-click on them and the GSM will launch the System Administration (SA) console on the subscriber's home server and bring you right to their profile page.

The GSM is also available for importing users into Cisco Unity.

Status Monitor

This section looks at the Status Monitor
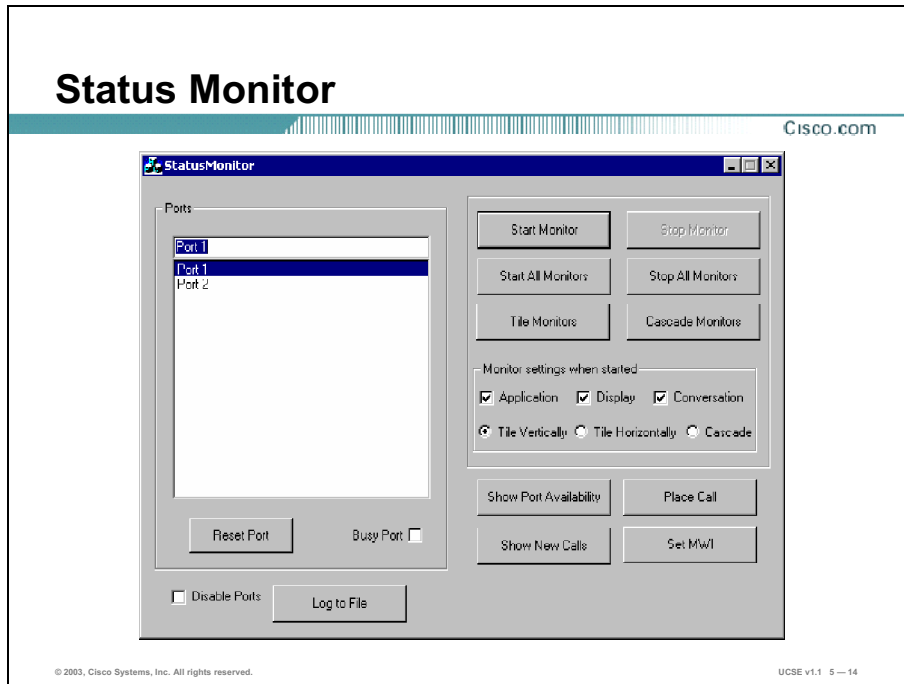
There are two different versions of Status Monitor. The Status Monitor shown here is in the \Commserver\Techtools directory and is not password protected. This Status Monitor provides you with a live graphic representation of the Cisco Unity state of application, display and conversation. It is a useful tool in testing and troubleshooting call handler applications. Before you put a call handler application into production you should test the application on one port to see that call handlers are performing the expected actions.

Summary

This section summarizes the key points discussed in this lesson.

Summary

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Upon completion of this lesson, you should be able to perform the following tasks:

- **Describe the function of selected Cisco Unity Administration Tools**
- **Describe the function of the Status Monitor**

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Next Steps

After completing this lesson, go to:

■ Cisco Unity Audio Management Tools

References

For additional information, refer to these resources:

■ *Cisco Unity Troubleshooting Guide*

■ *Cisco Unity System Administration Guide*

Cisco Unity
Audio Management Tools

Lesson Overview

This lesson discusses various management tools available through the Tools Depot Utility. The Audio Management tools are necessary for modifying audio levels and quality of Cisco Unity prompts and greetings. This is also where you can change the codec (711 or 729a) in which Cisco Unity stores messages.

Importance

There may be times when you have to change the codec on an existing system. After an upgrade there may be a need be to change the audio levels.

Objectives

Upon completing this lesson, you will be able to:

- Describe the use of Set Record Format Utility

- Describe the use of Set Wave Format

- Describe the use of the Set Wave Gain Utility

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

- Knowledge of Cisco Unity System

- Knowledge of available sound codecs

Outline

This lesson includes these sections:

- Overview

- Set Record Format Utility

- Set Wave Format

- Set Wave Gain Utility

- Summary

Set Record Format Utility

This section discusses the Set Record Format utility.
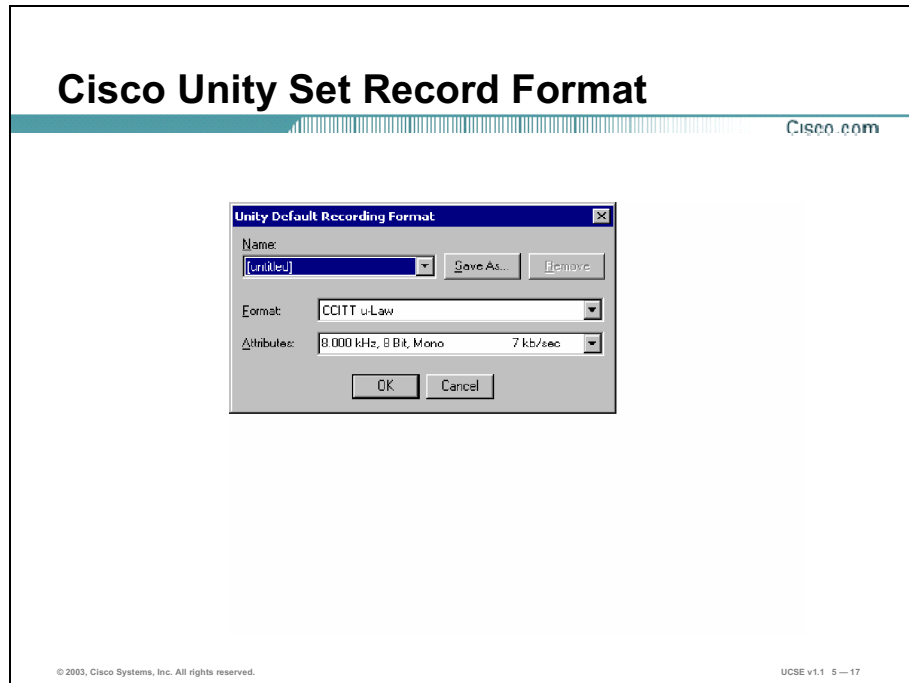
The Set Record Format Utility allows you to choose any sound codec installed on the Unity server as a default recording format Cisco Unity uses for **ALL** recordings. By default the record format is set to 8Kb MuLaw (codec 711). Any codec can be selected and sample rates can be adjusted. Remember that this affects all recordings on Cisco Unity. It is not possible to select specific formats for individual users, ports, WAV file types, etc. It will be necessary to restart Cisco Unity before the recording format changes take effect.

Be sure to select a codec that all clients will be happy with. The audio quality of the 711 and 729 codecs are noticeably different. If you send a voice mail to a user who will be accessing that message via their desktop messaging client, they will need the same codec installed on their local system to play it.

Set Wave Format

This section discusses the Set Wave Format utility.
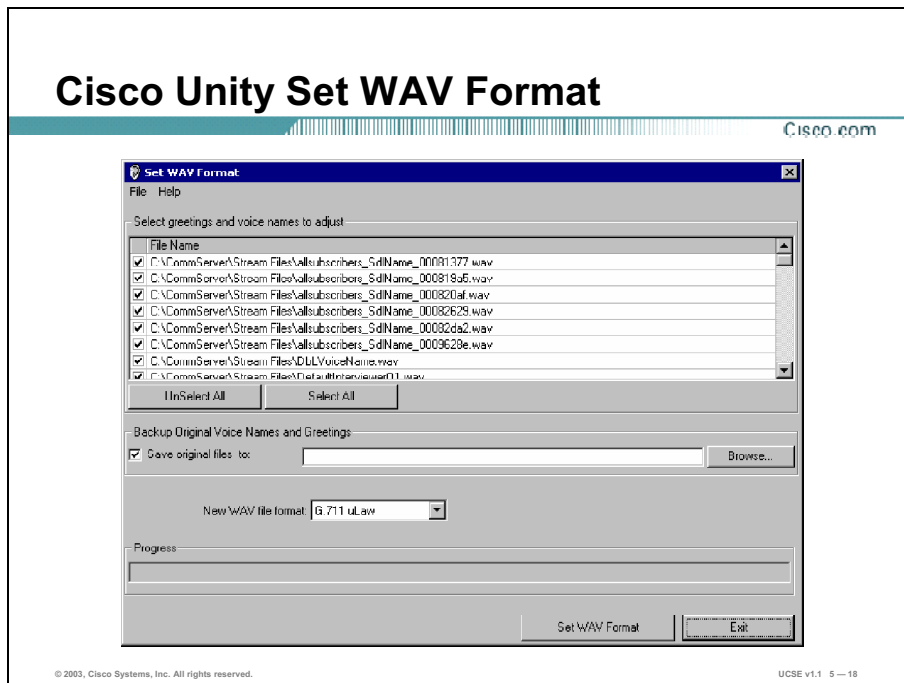
The Set WAV Format tool allows you to convert all the standing greetings and voice names on a Unity server to a selected WAV codec. You can choose from G.711 uLaw, G.711 aLaw or G.729a.

If a site has selected to change recording formats from G.711 (default) to G.729a for instance, you may want to use this tool to convert all standing greetings and voice names into G.729a. While Unity will convert from G.711 to G.729a (and vice versa) on the fly using software, this does require some CPU cycles and it's often desirable to have all WAV files in the same format to prevent this.

It is strongly recommended that you backup your greetings and voice names before changing their format. If the WAV files are damaged or don't sound good, you can then recover some or all of them. The Set WAV Format tool has a built in backup and restore mechanism for all greetings and voice names. Simply select a directory to copy greetings to using the **Browse** button and check the "Save original files to" option. Before modifying the WAV Files, the tool will copy all greetings and voice names to the target directory. To restore these greetings, select the "Restore backed up greetings and voice names" option from the File menu.

This tool does NOT convert standing messages in subscriber's mailboxes. Converting WAV files from 711 to 729 and back to 711 will degrade sound quality since the formats are compressed differently and you lose a certain amount of information during the conversion.

Wave Gain Utility

This section discusses the Wave Gain utility.

Cisco Unity Wave Gain Utility

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WaveGain

Record Gain in dB   0   Set Record Gain

Playback Gain in dB   0   Set Playback Gain

Exit
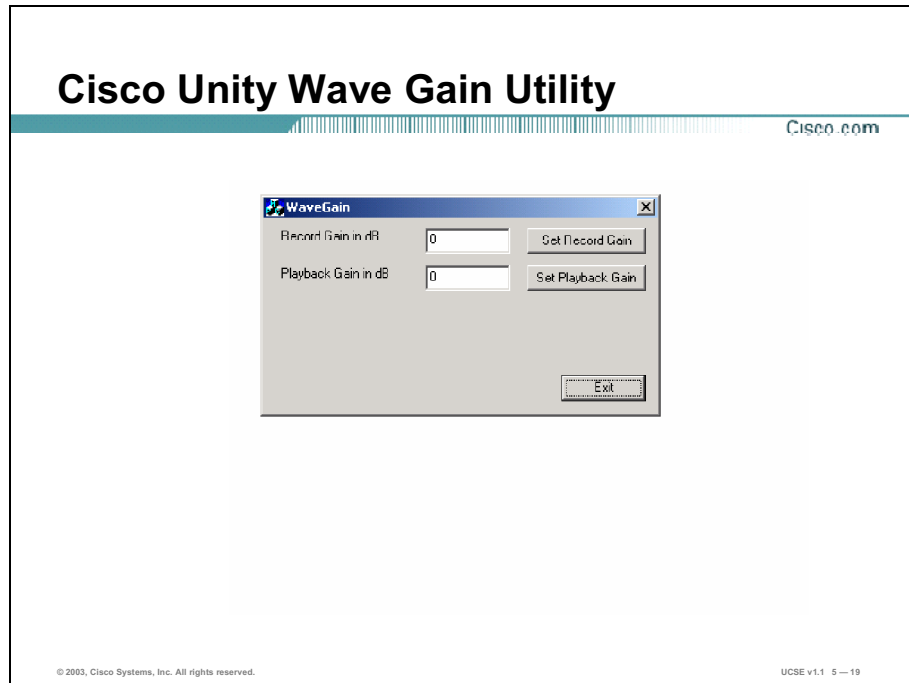
The WaveGain utility allows you to adjust the overall volume adjustment for all new recordings or for all playbacks when using Call Manager. You enter the increase (positive numbers) or decrease (negative numbers) in decibels.   The changes take place immediately while Unity is running so you can quickly adjust the playback/record levels until you're happy with them. Once you've found the values you want, you need to write those into the registry manually or use the Advanced Settings Tool to do this for you. You must edit the registry for the values to be in effect the next time you restart your system.

Summary

This section summarizes the key points discussed in this lesson.

Summary

Cisco.com

Upon completion of this lesson, you should be able to perform the following tasks:

- **Describe the function of Cisco Unity Set Record Utility**
- **Describe the function of Cisco Unity Set Wave Format Utility**
- **Describe the function of Cisco Unity Set Wave Gain Utility**

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Next Steps

After completing this lesson, go to:

■ Cisco Unity Diagnostic Tools

References

For additional information, refer to these resources:

■ *Cisco Unity System Administration Guide*

■ *Cisco Unity Troubleshooting Guide*

Cisco Unity Diagnostic Tools

Lesson Overview

This lesson discusses the Cisco Unity Diagnostics Tools available in the Cisco Unity product. These tools help in setting traces and logging debug information for resolving Cisco Unity problems.

Importance

The Diagnostics tools assist in maintaining a properly running Cisco Unity system. The Database Walker Utility for instance will check the integrity of your database, and the Diagnostic traces will log additional information for TAC to help troubleshoot any issues with your system.

Objectives

Upon completing this lesson, you will be able to:

- Describe the function of the Database Walker utility

- Describe the use of Diagnostic Traces

- Describe the function of the Sys Check utility

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

- Knowledge of the Cisco Unity System

Outline

This lesson includes these sections:

- Overview

- The Database Walker Utility

- Diagnostic Traces

- The Sys Check Utility

- Summary

Database Walker Utility

This section discusses the Database Walker Utility.
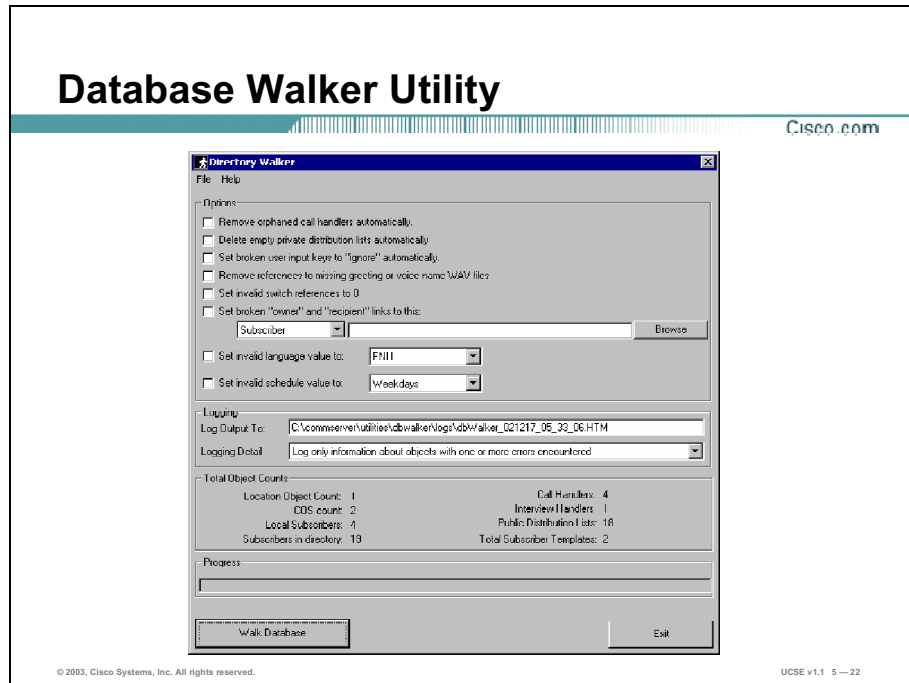
This utility walks the Cisco Unity database and makes a series of checks on all call handler, subscriber, subscriber template, interview handler, locations and directory handler objects in the database. If there's a problem the string "(error)" will appear in red in the output HTML. Warning strings in yellow that start with "(warning) are also logged for items that you should check on but are not necessarily problems. If an item is automatically fixed, a string that starts with "(fixed) will be logged in green directly under the error to indicate what was done. When the utility is complete, a dialog box will pop up letting you know it's finished and telling you how many errors and warnings were encountered in the process. You'll be given the opportunity to view the output file. Just search the output file for the string "(error)" or "(warning)" and you will be taken right to each problem in the log. Brief explanations of the problems encountered will usually appear on the following line in the log. Be sure to read them in their entirety to determine what you should do about them, if anything.

Some problems are logged as errors and fixed automatically on the fly (i.e. if the standard contact rule or greeting rule has been disabled, it will be enabled again on the fly). Some problems are fixed optionally if you indicate it's OK (i.e. orphaned call handlers are removed if you check the option to do so at the top of the form). Other problems cannot be fixed automatically and you will need to intervene manually to clear the issue up.

The **Logging Detail** drop-down list box can be set to show information about all objects checked during the database walk or you can choose to limit the output to only those objects that encounter one or more errors (default). Each time you press the "Walk Database" button; a new output file is generated and stored under the \logs\ directory where you installed dbWalker. To quickly view the logs directory you can select File > View Log Directory from the menu

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and it'll open File Explorer to that directory automatically. Whenever dbWalker runs it will automatically delete any logs in this directory older than 10 days.

Diagnostic Traces

This section discusses the diagnostic traces available.
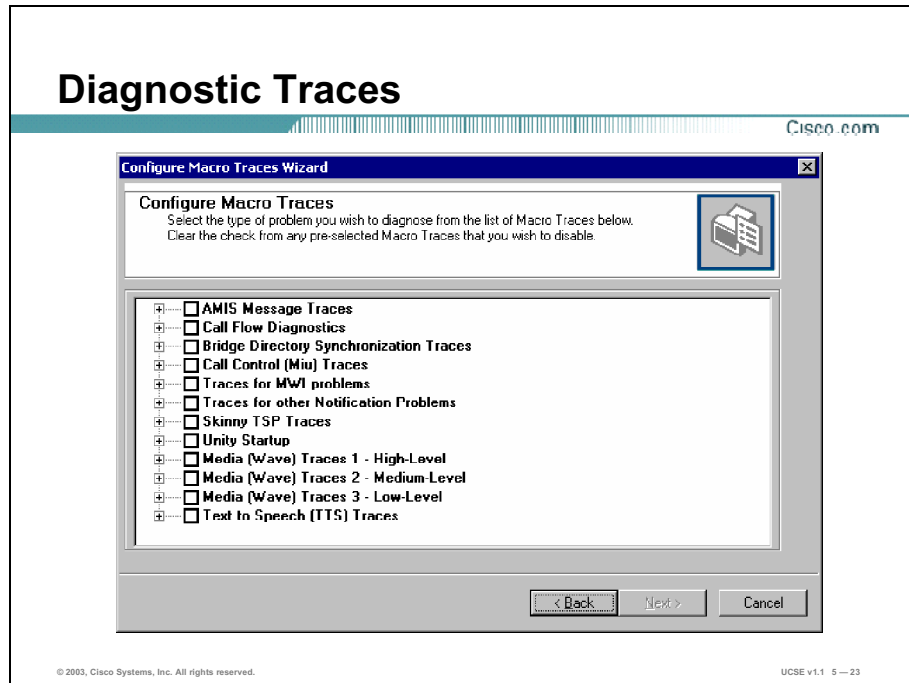
The Cisco Unity Diagnostic Tool allows creating and viewing of diagnostic log files to troubleshoot problems. It replaces the diagnostic log functionality in Maestro Tools, and allows the system administrator or TAC staff to selectively run diagnostic traces at two levels.

- **Macro Traces**. These are collections of component traces that help diagnose problems such as message waiting indicator and system problems.

- **Micro Traces**. These are the individual component traces. Each component has up to 32 traces that can be individually selected.

The Cisco Unity Diagnostic Tool also allows the system administrator or TAC staff to perform the following tasks.

- **Create new log files on demand**. This makes troubleshooting problems easier. When a problem can be reproduced reliably, the system administrator can close all existing log files and create new log files prior to reproducing the problem. This eliminates many unnecessary and unrelated items from the logs.

- **Configure log settings**. The system administrator can adjust the maximum disk space allowed for all diagnostic log files. The default setting is 400 MB. The Logging Properties screen also allows the system administrator to disable all diagnostic output by clearing the Diagnostic Output check box. The system administrator can also change the location of the log files.

- **Gather standard logs**. This option provides the ability to quickly gather all or selected Microsoft Windows and Cisco Unity logs.

- **Disable all traces.** This is a quick way to return diagnostic logs to their default settings after troubleshooting efforts are complete.

- **View the Event Log**. The Event Log files for either the local computer or another computer can be viewed and exported.

Sys Check Utility

This section discusses the Sys Check Utility.
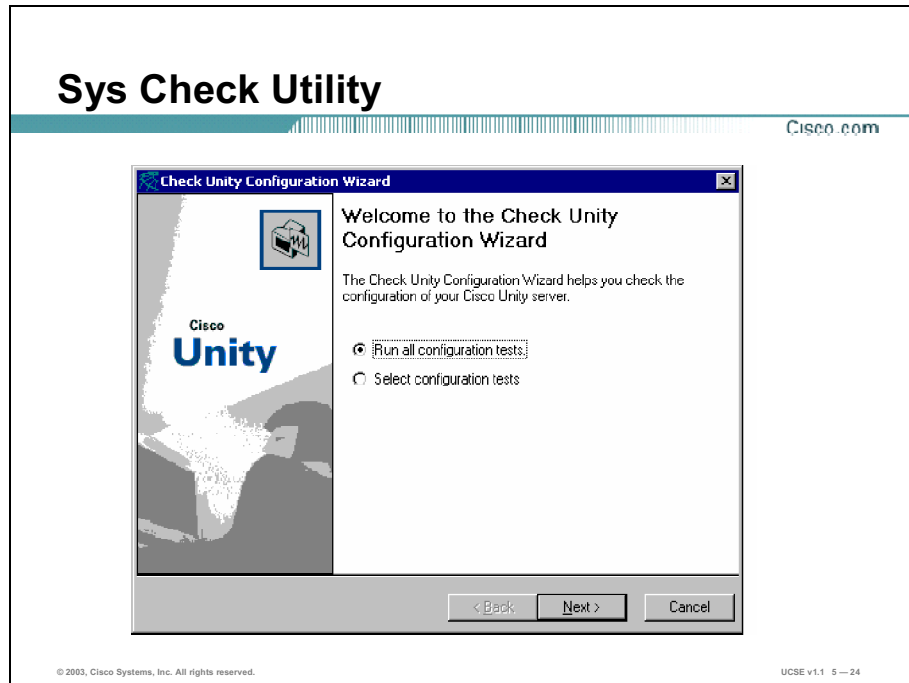
The SysCheck tool is used to help troubleshoot difficulties when the Unity installation program is not able to complete due to missing rights and permissions. This is the same tool used by the setup application itself to determine if the account running Unity setup has all the rights necessary to complete the task. Running SysCheck directly will give more detailed information about the source of the failure and can assist in resolving the problem.

This can be run prior to installation directly from the Unity installation CDs or post install to check if rights/permissions have been removed from the Unity service account and also to check for basic database configuration issues.

To check for database inconsistencies, however, it's recommended you use the dbWalker tool. SysCheck is primarily a rights checking application.

Summary

This section summarizes the key points discussed in this lesson.

Summary

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Upon completion of this lesson, you should be able to perform the following tasks:

- **Describe the function of the Database Walker Utility**
- **Describe the function of Diagnostic Traces**
- **Describe the function of the Sys Check Utility**

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Next Steps

After completing this lesson, go to:

- Cisco Unity Reporting Tools

References

For additional information, refer to these resources:

- *Cisco Unity System Administration Guide*

- *Cisco Unity Troubleshooting Guide*

Cisco Unity Reporting Tools

Overview

This lesson will discuss some of the reporting tools that are part of the Tools Depot in Cisco Unity.

Importance

These reporting tools gather valuable information about your Cisco Unity system. Some of these tools are used specifically with the Cisco Unity Bridge. This information can be important in keeping Unity running smoothly or for troubleshooting purposes.

Objectives

Upon completing this lesson, you will be able to:

■   Describe the function of the Bridge Traffic Analyzer

■   Describe the function of the Port Usage Analyzer

■   Describe the function of the Gather Unity System Information

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

- Knowledge of the Cisco Unity system.

Outline

This lesson includes these sections:

- Overview

- Bridge Traffic Analyzer

- Port Usage Analyzer

- Gather Unity System Information Utility

- Summary

Bridge Traffic Analyzer

This section discusses the Bridge Traffic Analyzer.

Bridge Traffic Analyzer

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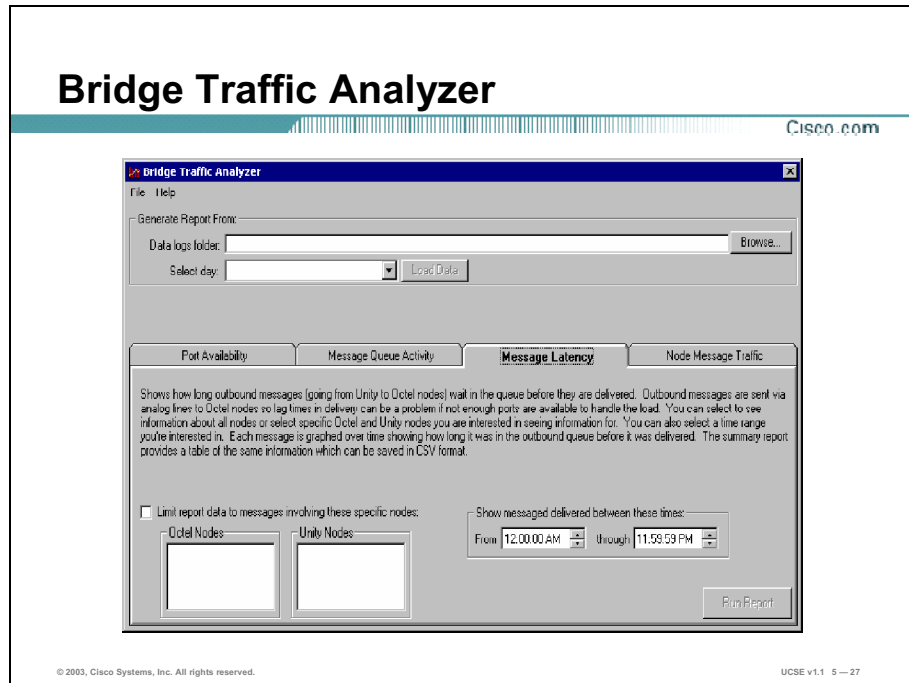
The Bridge Traffic Analyzer is a tool that allows administrators to obtain traffic data on their Cisco Bridge units to determine:

■ Total size of messages sent

■ Number of messages sent

■ Which servers messages have come from or gone to

■ How long it takes for messages to arrive at their destinations

■ How many analog ports are in use for message transport

The Port Availability report does not take any parameters; instead, it processes analog port activity on the log for the entire day. The purpose of this report is to show how many analog ports on the Bridge are being used to communicate to Octel nodes at any given time of the day. The report shows a bar for each minute of the day, indicating how many ports are in use and/or how many ports are available to take calls. You can choose to show busy ports, ports available to take calls, or both, by using the checkboxes at the top of the report form.

The Message Queue Activity report shows how many messages and how much data is passing through the inbound and outbound message queues on the Bridge server. Inbound messages are those traveling from Octel nodes to the Bridge via analog lines and then to the Cisco Unity servers via IP; outbound messages are those traveling from Cisco Unity to the Bridge via IP

and then to the Octel node. The Message Latency report is designed to allow you to see how long messages sit in the outbound queue before they are delivered to the Octel nodes via the analog lines on the Bridge. This report shows only the outbound messages because inbound messages that arrive on the Bridge are delivered to Cisco Unity via IP, and therefore the total time in the queue is very short. Outbound messages, on the other hand, arrive from Cisco Unity via IP, enter the queue, and then are delivered via analog lines to the target Octel node. If port resources are limited on the Bridge unit, messages can wait in queue for delivery for a long time and thus create a bottleneck at the analog lines. The Node Message Traffic report shows how many messages and how much data is passing between different Unity and Octel nodes. For example, this report can show which Octel nodes a specific Cisco Unity server exchanges messages with most heavily. As with the Message Latency report, you can select one or more Unity nodes, one or more Octel nodes, and a time range to run the report against.

Port Usage Analyzer

This section discusses the Port Usage Analyzer.
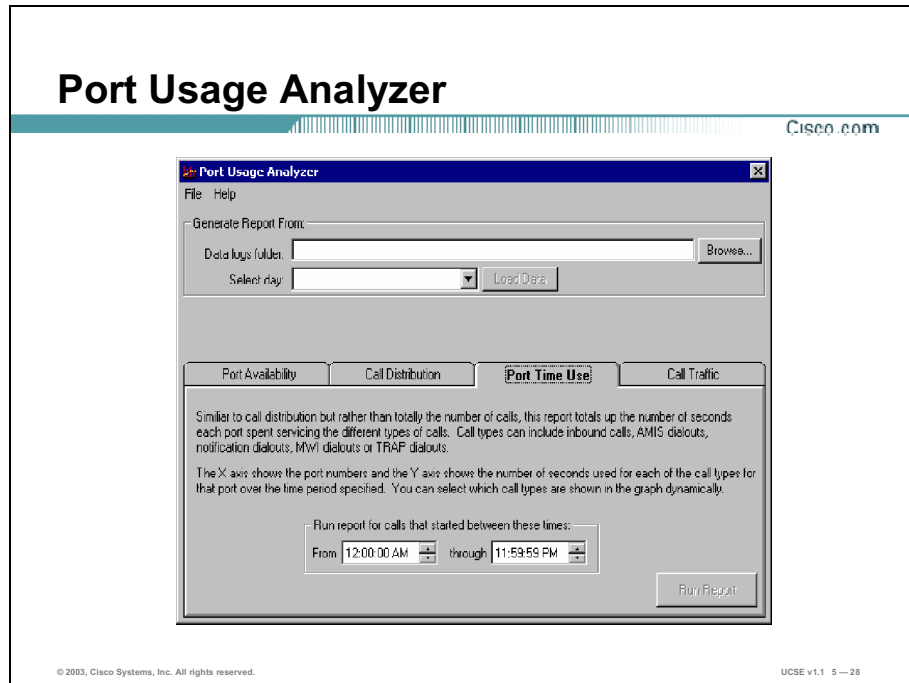
The Port Usage Analyzer could help to determine whether more ports may be needed for your Cisco Unity system. As explained in an earlier module, an insufficient number of ports could result in delayed dialouts for message notification, delayed message waiting indicators resulting in complaints of delayed messages, or callers receiving a busy signal when dialing Cisco Unity.

The Port Usage Analyzer tool is a suite of 4 reports designed to give administrators a better idea of the call traffic loads their Unity servers are experiencing. Reports are generated in a graphical chart style for easy analysis and can also be saved in simple CSV files if more post processing is desired.

The Port Availability report does not take any parameters; instead, it processes port activity on the log for the entire day. The purpose of this report is to show how many ports are being used and how many are available to process incoming calls at any given time of the day. The report shows a bar for each minute of the day, indicating how many ports are in use and/or how many ports are available to take calls. You can choose to show busy ports, ports available to take calls, or both, by using the checkboxes at the top of the report form.

The call distribution report shows what types of calls are coming in or going out of each port over the time range specified. By default the report is run for the entire day and shows totals of call types for each port however you can select a custom time range to run against.

The port time use report shows the same type of information that the call distribution report does. Instead of showing the number of each type of call to come into or go out of each port over a specified time range, it shows how many seconds each port was busy with each type of

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call. Be default the report is run over the entire day and the total number of seconds each port was busy with each type of call is shown.

The call traffic report shows how many of each of the 5 types of calls came into a port or originated from a port for each minute of the day. The report is run over the course of the entire day but you can zoom in from a full 24 hours to as close as 1 hour of data shown at a time using the Zoom menu. This report can be helpful in gauging how many calls are hitting the system during different times of the day, in particular if Unity is acting as a call redirector to internal extensions or the like. In conjunction with the port availability report it should give you a good idea of the traffic load patterns your system is experiencing over the course of a day.

Gather Unity System Information

This section discusses the Gather Unity System Information Utility

Gather Unity System Information Utility

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Gather Unity System Info

File   Help

Unity server name = MAIN2
Back end is Exchange 2000
Companion Exchange Server = MAIN2
Unity domain = CLASSROOM2
Global Catalog Server=main2.classroom2.com
Domain Controllers:
    classroom2.com: main2.classroom2.com
Unity version = 4.0(0.280)
Cisco Unity TSP version = 7.0.1.0
Exchange version = Exchange 2000 build: 5762: SP 2
SQL Version = Microsoft SQL Server 2000   8.00.665 : SP 2 : Security Rollup 1
Windows version = 5.0 Build 2195: Service Pack 3
Switch 1 = Cisco CallManager
Switch 2 - - not installed -
Ports configured = 2
Default recording codec = 8K Mu-Law
TUI Languages loaded = ENU
GUI Languages loaded = ENU
TTS Default Engine =
Total Subscribers = 2
Total Call Handlers = 3
Total subscribers homed locally = 2
Outlook is installed on the local server

Select directory to save CAB file to:

C:\CommServer\SystemInfo\   [Browse...]

[Write To File]   [Exit]

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This utility gathers basic information about the local Unity server installation and the last 5 days worth of application and system event log data.

Using Gather Unity System Information (GUSI) is very straight forward. When you run the tool, the basic system information is shown in the text box as the above screen shot demonstrates. You can copy this information to the clipboard using the File > Paste to Clipboard menu option. To gather the additional event log data that TAC will need for troubleshooting, just hit the "Write to File" button at the bottom. This will dump out the application and system event log messages for the last 5 days, include the system information shown in the text box, and bundle it all into a single CAB file in the directory indicated. In most cases the default directory under \Commserver\SystemInfo\ should be fine. However, if for whatever reason you want to use a different directory, use the Browse button to select an existing directory or create a new one.

Summary

This section summarizes the key points discussed in this lesson.

Summary

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Upon completion of this lesson, you should be able to perform the following tasks:

- **Describe the function of the Bridge Traffic Analyzer Utility**
- **Describe the function of the Port Usage Analyzer Utility**
- **Describe the function of the Gather Unity System Information Utility**

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Next Steps

After completing this lesson, go to:

■ Cisco Unity Switch Integration Tools

References

For additional information, refer to these resources:

■ *Cisco Unity System Administration Guide*

■ *Cisco Unity Troubleshooting Guide*

■ *Cisco Unity Bridge Networking Guide 2.1*

Cisco Unity
Switch Integration Tools

Lesson Overview

This lesson discusses the available Switch Integration tools located in the Tools Depot of Cisco Unity.

Importance

The importance of the Switch Integration Tools cannot be overstated. The tools greatly aid in the troubleshooting of the integration of Cisco Unity with a telephone system. If the integration is not set up correctly, Cisco Unity may not function properly and callers can neither leave messages nor can users retrieve messages. At other times technicians may spend many hours troubleshooting Cisco Unity when in fact the problem is occurring on the telephone system. These Switch Integration tools aid in pointing you in the right direction.

Objectives

Upon completing this lesson, you will be able to:

■   Describe and use the Call Viewer

■   Describe and use the Edit Switch Utility

■   Describe and use the Integration Monitor

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

- Knowledge of Cisco Unity

- Knowledge of PBX or IP Telephony

Outline

This lesson includes these sections:

- Overview

- Call Viewer Utility

- Edit Switch Utility

- Integration Monitor

- Summary

Call Viewer Utility

This section discusses the Call Viewer Utility
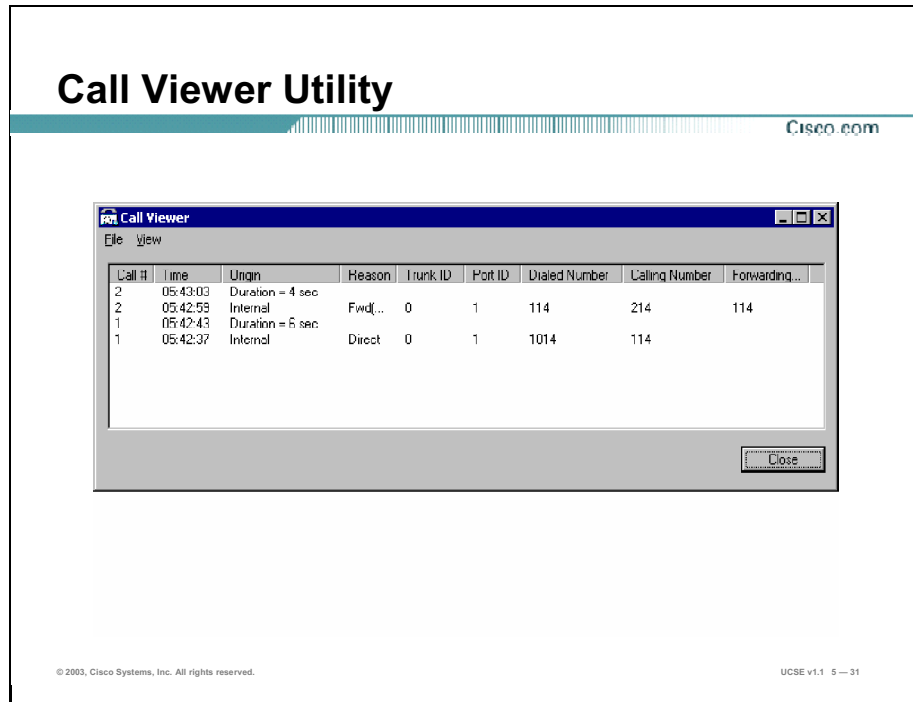
The Call Viewer application shows basic call information for incoming calls on an IP integration. All incoming call information that can be used to generate new call routing rules in Unity is shown. Any information not displayed is not being received from the switch integration for that call

There is an 'always on top' option on the View menu that is especially handy when editing and testing new call routing rules in the SA. You can have the Call Viewer up in the corner while testing your new rule values.

You can also save the information to a log file if, for instance, TAC wanted to review the call data.

This utility only works with an IP Integration, not on circuit-switched PBXes. For circuit-switched PBXes, you would use the Integration Monitor discussed later in this lesson.

Edit Switch Utility

This section discusses the Edit Switch utility.
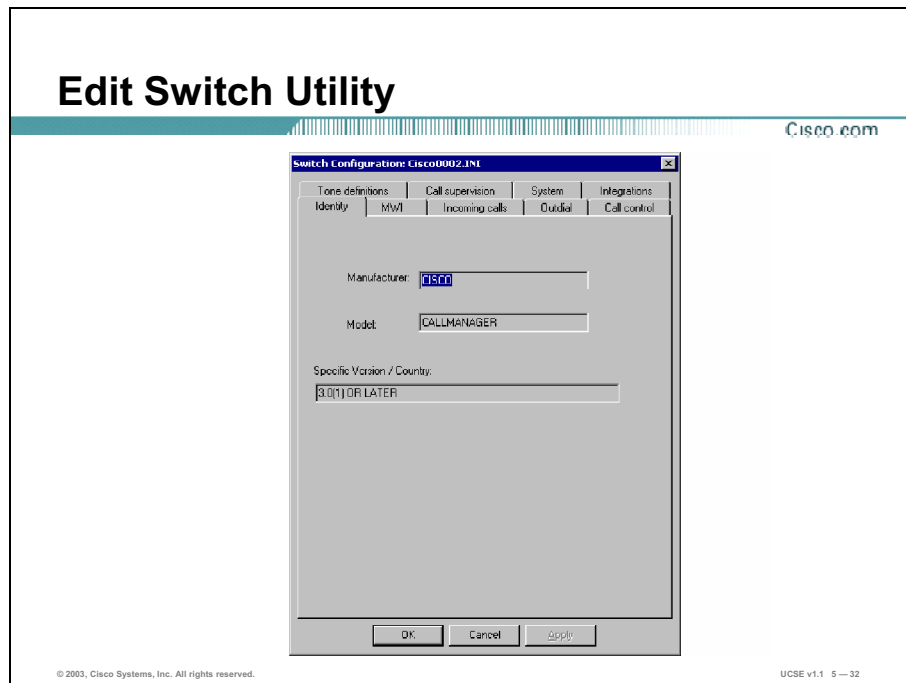
The Switch Configuration Editor allows you to edit specific integration information on the Cisco Unity server for the switch it is connected to. Data such as MWI on/off codes, the number of rings set before Unity will answer an incoming call, delays or access codes needed for outdialing etc. can be set here.

A field technician or a support person with knowledge of the switch integration features uses this tool. You can break your integration with the phone system using this tool if you're not careful. This is analogous to making Registry settings, or changing the protocol (language) one of the devices speaks. If the change is incorrect, the two devices will not understand each other.

This tool should not be used when making switch-related changes to Cisco CallManager. For those purposes use the tool found at Start > Settings > Control Panel > Phone and Modem Options on the Advanced tab. This is where you can gain access to the TSP used by Cisco Unity and CallManager.

Integration Monitor

This section discusses the Integration Monitor.
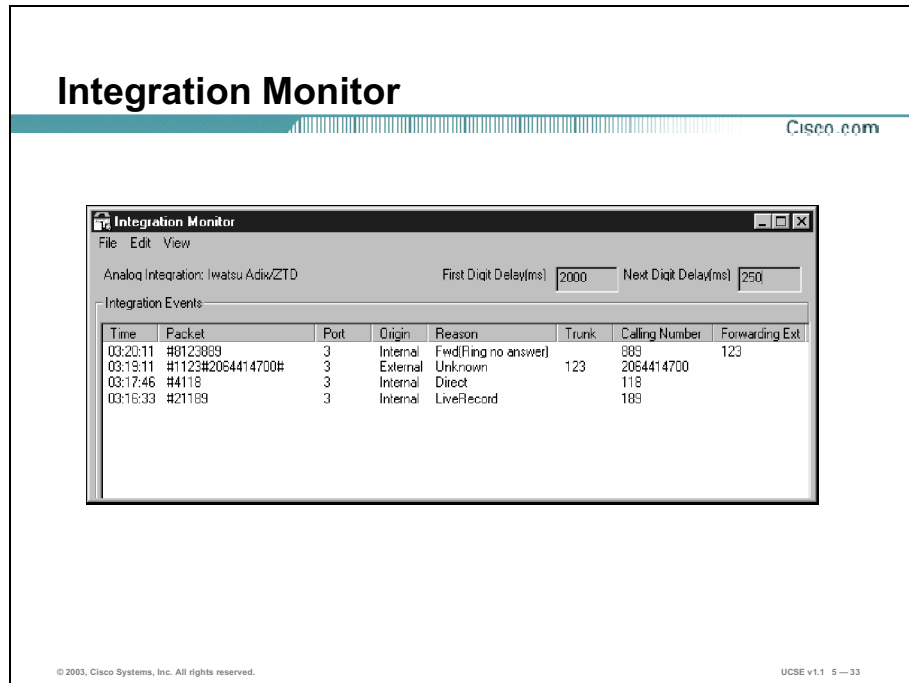
The Integration monitor shows detailed information coming from a circuit-switched phone system about each call. This shows much of the same information that the Call Viewer application shows but there's also raw packet information as well as the ability to see outbound call information

This tool does not work properly with Cisco CallManager as the switch. It should only be used for circuit-switched PBX integrations.

Summary

This section summarizes the key points discussed in this lesson.

Summary

Upon completion of this lesson, you should be able to perform the following tasks:

- **Describe the function of the Call Viewer Utility**
- **Describe the function of the Edit Switch Utility**
- **Describe the function of Integration Monitor**

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References

For additional information, refer to these resources:

- *Cisco Unity CallManager Integration Guide*

- *Cisco Unity Troubleshooting Guide*

Personal Assistant Troubleshooting and Monitoring

Lesson Overview

In this lesson we discuss issues that could arise with the Personal Assistant installation as well as monitoring tools to gauge Personal Assistant performance.

Importance

An efficiently running Personal Assistant system greatly increases the customer's satisfaction with the product. Knowledge of troubleshooting Personal Assistant leads to quick resolution of any issues.

Objectives

Upon completing this lesson, you will be able to:

- Resolve problems using Personal Assistant

- Monitor Performance of Personal Assistant

- Collect Call History Information

- Collect Trace and Debug Information

Learner Skills and Knowledge

To fully benefit from this lesson, you must have these prerequisite skills and knowledge:

■ Knowledge of Personal Assistant architecture and call flow.

Outline

This lesson includes these sections:

■ Overview

■ Resolving Problems Using Personal Assistant

■ Monitoring Performance

■ Collecting Call History Information

■ Collecting Trace and Debug Information

■ Summary

Resolving Problems Using Personal Assistant

This section discusses how to resolve selected issues involving Personal Assistant.

Resolving Personal Assistant Problems

Cisco.com

- **Unable to access user interface**
- **Unable to use speech commands**
- **Too many available options**
- **Dial Rules not working properly**
- **Users cannot browse Voice Mail**

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Listed above are some selected issues you may encounter using Personal Assistant. If you encounter other issues not listed, a good place to look for a resolution is in the *Troubleshooting Personal Assistant* chapter of the *Cisco Personal Assistant Administration Guide*.

If users cannot log in to the Personal Assistant user interface, you should verify that they are using the correct log-in name. This should match the unique user attribute defined in the Corporate Directory. This may be something such as the user's e-mail name or telephone number.

If users are forced to use touch-tone dialing because voice commands do not work, you should first check that the speech recognition server is functioning. If that is not the cause, you may have an inadequate number of speech-recognition servers to handle the number of users. In this case, you may need to add more speech licenses. You should also make sure you have refreshed the servers if you added any new speech-recognition servers recently. This must be done before those servers can support users.

When we refer to "too many available options", we mean users report they are given too many matches when using dial-by-name. To reduce the number of options lower the **Max Disambiguate** parameter of the speech recognition settings on the Personal Assistant server.

Dial Rules can be configured in Personal Assistant through the Personal Assistant administration interface or through the user interface. Those set through the administration interface take priority. Therefore, if a user has configured a dial rule that conflicts with one configured by the administrator, the user's rule will be ignored.

There may be a few reasons why users cannot browse their voicemail messages in Cisco Unity. If all users cannot browse than you should check the messaging configuration at System > Messaging. Personal Assistant requires the voice-mail servers to be identified by unqualified DNS names; in other words, Unity1 rather then Unity 1.domain.com. Entering IP addresses is not accepted.

If only some users cannot browse their Cisco Unity, you should check to see that the user's voice mailbox number matches the user's extension in Cisco CallManager; and that the user's ID is the same in both as well.

Monitoring Performance

This section discusses monitoring the performance of Personal Assistant.

Monitoring Performance

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- **Uses Windows Performance Monitor**
  - **Calls Answered**
  - **Dial-by-Name: Disambiguations**
  - **Dial-by-Name: Reconfirmations**
  - **Dial-by-Name: Speech System Error**
  - **Voice Mail**
  - **Voice Mail Login Failure**
  - **Voice Mail Reconfirmation**

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Personal Assistant uses the Windows operating system Performance Monitor to log performance counters. Above are listed a sampling of the counters that are monitored. These counters may be helpful in determining issues that may occur with Personal Assistant. For example, if there are many Dial-by-Name: Disambiguations it may indicate issues with speech recognition. Other counters may be helpful in justifying additional resources for more speech recognition sessions or overall Personal Assistant sessions.

An explanation of all counters can be found in the *Cisco Personal Assistant Administration Guide.*

Collecting Call History Information

This section discusses collecting call history.

Collecting Call History Information

Cisco.com

- **Used to identify toll fraud**
- **PACallHistoryxx.log in /logs folder**
- **2MB each**
- **100 files**
- **Overwrites when full**

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There may be times you are asked by the customer to investigate telephone toll fraud. The Call History calls can help you track these calls. The first line in the log document will tell you how to read the call history records.

Personal Assistant writes call history records to a series of files named PACallHistoryxx(00to99).log. These are stored on the Personal Assistant server under the /logs folder. Each log is limited to 2MB and when the logs are full, they are overwritten.

Personal Assistant can also use the CiscoWorks 2000 Syslog facility, in which case the call history information will be sent to syslog.

Collecting Trace and Debug Information

This section discusses collecting trace and debug information.

Cisco Personal Assistant Logs

Log Files Are Available for Troubleshooting

21122: Sep 06 12:00:14.229 PDT %PA-PASpeech-7-DEBUG:4006: nresult = 0

21123: Sep 06 12:00:14.229 PDT %PA-PASpeech-7-DEBUG:4006: pauser is null for disambiguation

21124: Sep 06 12:00:14.229 PDT %PA-PASpeech-7-DEBUG:4006: Nothing to disambiguate ..

21125: Sep 06 12:00:14.229 PDT %PA-PASpeech-7-DEBUG:4006: cmd = exit confidence=45

21126: Sep 06 12:00:14.229 PDT %PA-PASpeech-7-DEBUG:4006: MainMenu: isCmdexit: condition check is true

21127: Sep 06 12:00:14.229 PDT %PA-PASpeech-6-INFO:PAVmailDialog: Entering the onExit method

21128: Sep 06 12:00:14.229 PDT %PA-PASpeech-6-INFO:PAVmailDialog: Entering the prepareEndResult method

21129: Sep 06 12:00:14.292 PDT %PA-PASpeech-6-INFO:4006: PAVmailDialog: play VMAIL_PA_TRANSFER

21130: Sep 06 12:00:14.292 PDT %PA-PASpeech-6-INFO:4006: PAVmailDialog: exceptions, return to PA

21131: Sep 06 12:00:14.292 PDT %PA-PASpeech-6-INFO:PAVmailDialog: Exiting the prepareEndResult method

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When you contact Cisco TAC for help with a problem you are experiencing with Personal Assistant you may be requested to collect trace and debug information.

Collecting trace and debug information will affect Personal Assistant's performance, so you should only initiate traces when requested to by Cisco TAC. Traces are set under System Configuration. Available traces are:

■ PASRV-The main Personal Assistant server system.

■ SS_PA_TEL-The telephony system.

■ SS_PA-The Personal Assistant subsystem for LDAP access.

■ SS_PA_MAIL-The subsystem that interacts with the voice mail and paging.

■ PASCCP-The Skinny protocol subsystem.

■ PARULES-The rules-based call routing subsystem.

■ PASpeech-The speech recognition subsystem.

■ PADtmf- The DTMF interface.

The collected trace information is stored in the /logs folder of the Personal Assistant installation directory. Collected trace information may also be written to syslog if CiscoWorks 2000 Syslog is installed.

Course Summary

This section summarizes the key points discussed in this course.

Course Summary

Cisco.com

Upon completion of this course, you should be able to perform the following tasks:

- **Install, configure, and troubleshoot a Cisco Unity 4 messaging system**
- **Install, configure, and troubleshoot a Cisco Personal Assistant system**
- **Prepare to take the Cisco Unity exam**

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Next Steps

After completing this lesson, go to:

■ Prepare for the Cisco Unity Exam.

References

For additional information, refer to these resources:

■ *Cisco Personal Assistant Administration Guide*

Laboratory Exercise 1: Installing Cisco Unified Communications Software (Exchange)

Complete the laboratory exercise to practice what you have learned in this lesson.

Required Resources

These are the resources and equipment required to complete this exercise:

■ Cisco Unity server

Exercise Objective

In this exercise, you will install the Cisco Unity software.

After completing this exercise, you will be able to:

■ Use the Cisco Unity Installation and Configuration Assistant

■ Use the Permissions Wizard

■ Use the License Wizard

■ Use the Cisco Unity Setup

■ Use the Services Configuration Wizard

■ Use the Message Store Wizard

■ Use the Unity Telephone Integration Monitor

Task 1: Using the Permissions Wizard

During this task you will be setting permissions for the Cisco Unity installation.

Exercise Procedure

Complete these steps:

Step 1 On your Cisco Unity Server access the D:drive and select the **Unity 4.0** folder

Step 2 Select the **CD1** folder

Step 3 Double-click on the **SETUP.EXE** icon

Step 4 The Cisco Unity Configuration and Installation Assistant will launch. After reading the instructions, click **Continue**.

Step 5 On the Pre-Installation Requirements page read the steps. On Step 4 click the link **Run the Permissions Wizard**.

Step 6 On the Welcome screen choose **Microsoft Exchange 2000** and click **Next**.

Step 7 On the Choose Windows Account to Install Cisco Unity, type**:** your Domain\your Server#(example classroom1\server1), and click **Next**.

Step 8 On the Account to own Cisco Unity Directory Services screen, click **Change**, find your Service account, (example: Server1=User Server1), and click **OK**. Click **Next**.

Step 9 On the Account to own Cisco Unity Message Store Services screen, click **Change** and find the UnityAdmin Server#, (example Server1=UnityAdmin1). Click **OK**. For the password, type the word: password (lower case). Click **Next**.

Step 10 On the select Active Directory Container for New Objects screen, under Users, click **Modify** and select the Org# that corresponds with your Server # (example: Server1=Org1).

Step 11 Repeat the same steps for Groups. Click **Next**.

Step 12 On the Select which objects Cisco Unity Administrator can create screen, choose **all options** and click **Next**.

Step 13 On the Active Directory container for Location objects screen, click **Modify** and choose the Org that corresponds with your Server#. Click **Yes** to replace and then click **Next**.

Step 14 On the Active Directory Containers for Import screen, click **Add**, expand the domain and choose your Org. Click **OK** and then click **Next**.

Step 15 On Verify Permissions screen read it to make sure the correct selections were made, and click **Next**. The system will take a few minutes while it sets the permissions.

Step 16 After the permissions are granted, click **Finish**. You should be taken to a read me file that contains information on setting the necessary Exchange 5.5, Exchange 2000, or Domino permissions for the Cisco Unity installation. These permissions have already been set by your instructor so close the screen.

Exercise Verification

You have completed this exercise when you attain these results:

■   You are at the Install Unity Screen.

Task 2: Using Cisco Unity Setup

During this task you will be running the Cisco Unity Setup wizard.

Exercise Procedure

Complete these steps:

Step 1   On the Install Cisco Unity screen under Step 3, click the **<u>Run the Cisco Unity Setup Program</u>** link.

Step 2   A language selection box will appear. Double-click the **Double-click to continue in English** option**.**

Step 3   On the Welcome screen, click **Next.**

Step 4   The setup program takes a few minutes while it examines your server.

Step 5   On the User Information screen you will accept the defaults and click **Next**.

Step 6   On the Enter Installation Locations screen accept the defaults, and click **Next**.

Step 7   On the Select Features page make sure Install Unity and Enable TTS are checked. Uncheck the **Install Voice Card software** box. Click **Next**.

Step 8   On the Choose the System Prompt Set page select **G711**. Click **Next**.

Step 9   On the Unity Languages page select the **English (United States)** box. Click **Next**.

Step 10   On the Select Default Languages page you keep the English (United States) defaults and click **Next**.

Step 11   On the Select Keypad Map page you keep the default. Click **Next,** and again click **Next**.

Step 12   The program now has enough information to continue the install, so click **Next**.

Step 13   The system now installs the system default configuration. This could take up to 20 minutes. When you receive the Setup Complete message page click **Finish** to reboot the server.

Exercise Verification

You have completed this exercise when you attain these results:

■   You are at the Install the License File Wizard.

Task 3: Install the Cisco Unity License File

During this task you will install the license file for Cisco Unity.

Exercise Procedure

Complete these steps:

Step 1 On the Install Cisco Unity License File page, select the link in Step 2 **Run the Cisco Unity License File Wizard**.

Step 2 On the Welcome screen click **Next**.

Step 3 On the License Files page click **Add**.

Step 4 On the Add page, select **CiscoUnity4.0.lic** and click **Open**.

Step 5 The file will appear in the License Files page. Click **Next**.

Step 6 The Licenses page shows you the licenses allowed on your system. Review them and click **Next**.

Step 7 On the Completing the Install License File Wizard page, click **Finish**.

Exercise Verification

You have completed this exercise when you attain these results:

You are at the Configure Cisco Unity Services screen.

Task 4: Configure the Cisco Unity Services

During this task you will configure the services for Cisco Unity.

Exercise Procedure

Complete these steps:

Step 1   On the Configure the Cisco Unity Services screen, select the link in Step 2 **Run the Cisco Unity Services Configuration Wizard**.

Step 2   On the Welcome to the Cisco Unity Configuration Wizard screen, click **Next**.

Step 3   On the Message store type, select **Microsoft Exchange 2000**, then click **Next**.

Step 4   On the Select directory services account page, confirm the Server# account is in the Account field.

Step 5   In the **password** field type `password`. Click **Next**.

Step 6   On the Select message store account page, confirm the Unity Admin Server# account is in the Account field.

Step 7   In the **password** field type `password`. Click **Next**

Step 8   On the Select local services account page**,** click **Account**, and click **Browse,** and find your server account (example Server1@classsroom1.com), and click **OK**.

Step 9   The password field is filled in for you. Click **Next**.

Step 10 Click **Next** to confirm changes, and the wizard loads the changes. Click **Next** to continue and then click **Finish** to complete the wizard**.**

Exercise Verification

You have completed this exercise when you attain these results:

You are at the Configure Cisco Unity Message Store screen.

Task 5: Configure the Cisco Unity Message Store.

During this task you will configure the Message Store for Cisco Unity.

Exercise Procedure

Complete these steps:

Step 1   On the Configure the Cisco Unity Message Store screen, select the link in Step 3 **Run the Cisco Unity Message Store Configuration Wizard**.

Step 2   On the Welcome screen, click **Next.**

Step 3   On the Select installation account, check that the User name is your server# account and under password, type: password. Click **Next**.

Step 4   The Select Unity System Administrator account will be the one you selected earlier, so click **Next**

Step 5   On Select message store, select **Microsoft Exchange 2000** and click **Next**.

Step 6   On Select mailbox location under Exchange server select **your server#**. Click **Next**.

Step 7   On the Select Active Directory container for new objects confirm that Users, Distribution lists and Locations are set for your Org. Click **Next**..

Step 8   Click **OK** to stop Unity the services.

Step 9   Next you decide how subscribers will be created. Select **Create new accounts** and **import existing accounts**. Click **Next**.

Step 10   The Directory services account will be the same one you selected earlier. Click **Next**, and then click **Finish** to complete the wizard.

Exercise Verification

You have completed this exercise when you attain these results:

You are at the Integrate the Phone System with Cisco Unity.

Task 6: Integrate the Phone System with Cisco Unity

During this task you will use the Cisco Unity Telephone Integration Manager to configure a Cisco Unity/Cisco CallManager integration.

Exercise Procedure

Complete these steps:

Step 1   On the Integrate the Phone System with Cisco Unity page, select the link in Step 1, **Run the Cisco Unity Telephone Integration Manager**.

Step 2   On the Manage Integrations page select **Create Integration**.

Step 3   On the Welcome to the Telephony Integration Setup Wizard select **Cisco CallManager** and click **Next**.

Step 4   Accept the defaults on the name of Cisco CallManager and the Cluster. Click **Next**.

Step 5   Enter the IP address designated by your instructor, and accept the default TCP port of 2000. Click **Next**.

Step 6   Click **Next** to bypass the Secondary server for failover setup.

Step 7   Under the MWI extensions enter `7001` for MWI on extension and `7002` for MWI off extension. Click **Next**.

Step 8   Change the number of VoiceMail ports to **2**. Change the default CallManager Device Name Prefix to `Cisco UM(your Server#)-V1` (example: Server1=CiscoUM1-V1). Click **Next**.

Step 9   Click **Next** to bypass the Enter trunk access code setup and then click **Finish** to complete the Integration Wizard.

Step 10   Select **OK** after Cisco Unity tells you the services have restarted.

Step 11   Close the Manage Integration Screen. Click **Close** to close and complete the Cisco Unity Installation and Configuration Assistant.

Exercise Verification

You have completed this exercise when you attain these results:

You are able to dial your Cisco Unity system and listen to the Opening Greeting.

Laboratory Exercise 2: Installing Cisco Unified Communications Software (Domino)

Complete the laboratory exercise to practice what you have learned in this lesson.

Required Resources

These are the resources and equipment required to complete this exercise:

- Cisco Unity server

Exercise Objective

In this exercise, you will install the Cisco Unity software.

After completing this exercise, you will be able to:

- Use the Cisco Unity Installation and Configuration Assistant

- Use the Permissions Wizard

- Use the License Wizard

- Use the Cisco Unity Setup

- Use the Services Configuration Wizard

- Use the Message Store Wizard

- Use the Unity Telephone Integration Monitor

Task 1: Using the Permissions Wizard

During this task you will be setting permissions for the Cisco Unity installation.

Exercise Procedure

Complete these steps:

Step 1   On your Cisco Unity server access the D: drive and select the **Unity 4.0** folder.

Step 2   Select the **CD1** folder.

Step 3   Double-click the **SETUP.EXE** icon.

Step 4   The Cisco Unity Configuration and Installation Assistant will launch. After reading the instructions, click **Continue**.

Step 5   On the Pre-Installation Requirements page read the steps. On Step 4 click the link **Run the Permissions Wizard**.

Step 6   On the Welcome screen choose **Lotus Domino** and click **Next**.

Step 7   On the Choose Windows Account to Install Cisco Unity, Your installation account is filled in. Confirm it is your classroom domain\Server#(example `classroom1\server1`), and click **Next**.

Step 8   On the Account to own Cisco Unity Services screen, click **Change** and find your Service account, (example: Server1=User Server1), and click **OK**. Click **Next**.

Step 9   On Verify Permissions screen read it to make sure the correct selections were made, and click **Next**. The system will take a few minutes while it sets the permissions.

Step 10   After the permissions are granted, click **Finish**. You should be taken to a read me file that contains information on setting the necessary Exchange 5.5, Exchange 2000, or Domino permissions for the Cisco Unity installation. These permissions have already been set by your instructor so close the screen.

Exercise Verification

You have completed this exercise when you attain these results:

- You are at the Install Unity screen.

Task 2: Using Cisco Unity Setup

During this task you will be running the Cisco Unity Setup wizard.

Exercise Procedure

Complete these steps:

Step 1   On the Install Cisco Unity screen under Step 3, click the **Run the Cisco Unity Setup Program** link.

Step 2   A language selection box will appear. Double-click the **Double-click to continue in English** option**.**

Step 3   On the Welcome screen, click **Next.**

Step 4   The setup program takes a few minutes while it examines your server.

Step 5   On the User Information screen you will accept the defaults and click **Next**.

Step 6   On the Enter Installation Locations screen accept the defaults, and click **Next**.

Step 7   On the Select Features page make sure Install Unity and Enable TTS are checked. Uncheck the **Install Voice Card software** box. Click **Next**.

Step 8   On the Choose the System Prompt Set page select **G711**. Click **Next**.

Step 9   On the Unity Languages page select the **English (United States)** box. Click **Next**.

Step 10   On the Select Default Languages page you keep the English (United States) defaults and click **Next**.

Step 11   On the Select Keypad Map page you keep the default. Click **Next,** and again click **Next**.

Step 12   The program now has enough information to continue the install, so click **Next**.

Step 13   The system now installs the system default configuration. This could take up to 20 minutes. When you receive the Setup Complete message page click **Finish** to reboot the server.

Exercise Verification

You have completed this exercise when you attain these results:

■   You are at the Install the License File Wizard screen.

Task 3: Install the Cisco Unity License File

During this task you will install the license file for Cisco Unity.

Exercise Procedure

Complete these steps:

Step 1   On the Install Cisco Unity License File page, select the link in Step 2 **Run the Cisco Unity License File Wizard**.

Step 2   On the Welcome screen click **Next**.

Step 3   On the License Files page click **Add**.

Step 4   On the Add page, select **CiscoUnity4.0.lic** and click **Open**.

Step 5   The file will appear in the License Files page. Click **Next**.

Step 6   The Licenses page shows you the licenses allowed on your system. Review them and click **Next**.

Step 7   On the Completing the Install License File Wizard page, click **Finish**.

Exercise Verification

You have completed this exercise when you attain these results:

■   You are at the Configure Cisco Unity Services screen.

Task 4: Configure the Cisco Unity Services

During this task you will configure the services for Cisco Unity.

Exercise Procedure

Complete these steps:

Step 1   On the Configure the Cisco Unity Services screen, select the link in Step 2 **Run the Cisco Unity Services Configuration Wizard**.

Step 2   On the Welcome to the Cisco Unity Configuration Wizard screen, click **Next**.

Step 3   On the Message store type, select **Lotus Domino R5**, and then click **Next**.

Step 4   On the Select directory services and message store account page, confirm the Server# account is in the Account field.

Step 5   In the **password** field type `password`. Click **Next**.

Step 6   On the Select local services account page**,** click **Account**, and click **Browse,** and find your server account (example Server1@classsroom1.com), and click **OK**.

Step 7   The password field is filled in for you. Click **Next**.

Step 8   Click **Next** to confirm changes, and the wizard loads the changes. Click **Next** to continue and then click **Finish** to complete the wizard**.**

Exercise Verification

You have completed this exercise when you attain these results:

■   You are at the Configure Cisco Unity Message Store screen.

Task 5: Configure the Cisco Unity Message Store.

During this task you will configure the Message Store for Cisco Unity.

Exercise Procedure

Complete these steps:

Step 1   On the Configure the Cisco Unity Message Store screen, select the link in Step 3 **Run the Cisco Unity Message Store Configuration Wizard**.

Step 2   On the Welcome screen, click **Next.**

Step 3   On the Select installation account, check that the User name is your server# account and under password, type: password. Click **Next**.

Step 4   The Select Unity System Administration account will be the one you selected earlier, so click **Next**

Step 5   On Select message store, select **Lotus Domino R5** and click **Next**.

Step 6   On Select Directory Services Account, confirm the User name is your server account. Click **Next**.

Step 7   On the Confirm Domino User ID password, type: password, Click **Next**. (If you receive an error of "wrong password", leave the password field blank)

Step 8   On Collect Address Book Information enter the following information: Server type: Domino1 or Domino2 depending on which domain you are in, Address Book: Names.nsf, Display Name: Domino User List. Click the   button to add the information and then click **Next**.

Step 9   Click **OK** to stop the Unity services.

Step 10   Click **Finish** to complete the wizard.

Exercise Verification

You have completed this exercise when you attain these results:

■   You are at the Integrate the Phone System with Cisco Unity screen.

Task 6: Integrate the Phone System with Cisco Unity

During this task you will use the Cisco Unity Telephone Integration Manager to configure a Cisco Unity/Cisco CallManager integration.

Exercise Procedure

Complete these steps:

Step 1   On the Integrate the Phone System with Cisco Unity page, select the link in Step 1, **Run the Cisco Unity Telephone Integration Manager**.

Step 2   On the Manage Integrations page select **Create Integration**.

Step 3   On the Welcome to the Telephony Integration Setup Wizard select **Cisco CallManager** and click **Next**.

Step 4   Accept the defaults on the name of Cisco CallManager and the Cluster. Click **Next**.

Step 5   Enter the IP address designated by your instructor, and accept the default TCP port of 2000. Click **Next**.

Step 6   Click **Next** to bypass the Secondary server for failover setup.

Step 7   Under the MWI extensions enter `7001` for MWI on extension and `7002` for MWI off extension. Click **Next**.

Step 8   Change the number of VoiceMail ports to **2**. Change the default CallManager Device Name Prefix to `Cisco UM(your Server#)-VI` (example: Server1=CiscoUM1-VI). Click **Next**.

Note   The character after the "V" is the letter "l", not the numeral "1".

Step 9   Click **Next** to bypass the Enter trunk access code setup and then click **Finish** to complete the Integration Wizard.

Step 10 Select **OK** after Cisco Unity tells you the services have restarted.

Step 11 Close the Manage Integration Screen. Click **Close** to close and complete the Cisco Unity Installation and Configuration Assistant.

Exercise Verification

You have completed this exercise when you attain these results:

■   You are able to dial your Cisco Unity system and listen to the Opening Greeting.

Task 7: Installing Domino Unified Communications Software (DUCS)

During this task you install DUCS, which gives you ViewMail for Notes capability

Exercise Procedure

Complete these steps:

Step 1 On the desktop navigate to **My Computer > Unity (D:) > DUCS 1.11 > csClient.** Double click **Setup.**

Step 2 Click **Accept** to accept the License Agreement.

Step 3 Click **Next** on the Welcome page**.** Accept the default location by clicking **Next.**

Step 4 Check the **Update mail file** box. Confirm **Office (Network)** is highlighted and click **Next.**

Step 5 If the install asks for a password, type**:** password and click **OK.**

Step 6 Click **Next** to copy files**.**

Step 7 Uncheck the **Readme file** box and then click **Finish.**

Step 8 When asked to install the 729a driver, click **OK.** You may be told the file already exists do you want to overwrite. If so, click **NO.** Click **Yes** to restart the computer.

Step 9 After the computer restarts, login and click **Start > Search > For files and folders**, and search for the Notes.ini file on C: drive.

Step 10 Open the file and find the following line: **EXTMgR_Addins=ucclient**

Step 11 Edit the line by adding a comma then: CsNotesPwdSvr. (So the end result should be EXTMgr=ucclient,CsNotesPwdSvr.)

Step 12 Click **File**, and then **Save**. Close the file and restart the server.

Exercise Verification

You have completed this exercise when you attain these results:

■ You are able to open Lotus Notes and see the option for voice message.

Laboratory Exercise 3: Digital Networking in Cisco Unity

Complete the laboratory exercise to practice what you have learned in this lesson.

Required Resources

These are the resources and equipment required to complete this exercise:

■ Cisco Unity server

Exercise Objective

In this exercise, you will configure digital networking for Cisco Unity.

After completing this exercise, you will be able to:

■ Configure the default location object correctly.

■ Implement Digital Networking

■ Configure Dialing Domains

■ Configure Search Scopes

Task 1: Add an Active Directory Account and Import into Cisco Unity

During this task you will be adding an Active Directory Account and importing the account as a Cisco Unity subscriber.

Exercise Procedure

Complete these steps:

Step 1   Click **Start > Programs > Microsoft Exchange > Active Directory Users and Computers.**

Step 2   In the left side panel, expand the domain and right click **your Org**. Click **New**, and click **User.**

Step 3   Create a user by filling in the name. For User Logon enter `first initial` and `last name`. Click **Next.**

Step 4   You can create or leave the password blank. Confirm the rest of the fields are unchecked. Click **Next.**

Step 5   Confirm Create an Exchange Mailbox is checked. Under Server, select your server #. Click **Next** and then click **Finish**.

Step 6   On the right side panel find your new user and double click. Click **Member of**, click **Add**, select **Domain Admins**, and click **Add**. Click **OK**, click **OK**. Close the Active Directory Users and Computer window.

Step 7   Double-click the **System Administration shortcut** on the desktop.

Step 8   Click **Subscribers**, and click the **Add Icon**.

Step 9   Select **Import Existing Exchange User**, and click **Select**. Confirm Exchange is optioned under Mail system type and click **Find.**

Step 10   Scroll until you find the new user you created in Active Directory and click the **first name** link.

Step 11   Choose the **Default Administrator** subscriber template.

Step 12   Enter your telephone extension as the Extension and click **Add.**

Step 13   On the Profile page record the user's name. Uncheck **Set subscriber for self-enrollment at next login.**

Step 14   On the Phone Password page, uncheck **User Must Change Password at Next Logon**.

Step 15   Click **Greetings** and under Source select **Recording**, and record a personal greeting for the user.

Step 16   Click **Call Transfer**, select **Yes, ring subscriber's extension.** Click the **Save icon**.

Exercise Verification

You have completed this exercise when you attain these results:

■   You are able to call in to Cisco Unity from your telephone extension and are prompted to enter your password (12345).

Task 2: Configuring the Primary Location Object and Dialing Domains

In this task you configure the Primary Location object for your Cisco Unity server and set a Dialing Domain.

Exercise Procedure

Complete these steps:

Step 1   From the System Admin screen, click **Primary Location.**

Step 2   Under Display Name, type: your Server# (example Server1). Under Dial ID, type: 90Server# (example: Server1=901). Record your display name.

Step 3   For Dialing Domain, select the lower radio button and type in your domain name in lower case (dialing domain entries are case sensitive). Under SMTP also type in your domain name.

Step 4   On the Navigation bar, click **Addressing Options,** and set both the Subscriber Searches and Blind Addressing fields to **Global Directory**. Check **Include location in searches** box**.** Click the **Save Icon.**

Step 5   Move to the main Navigation bar using the **Back** (blue triangle) button.

Step 6   After a few minutes click **Delivery Location**. Click the **Find Icon**. You should see all the other servers within your domain listed**.**

Exercise Verification

You have completed this exercise when you attain these results:

- When you can see the other servers within your domain listed under Delivery Locations.

Task 3: Messaging within an organization using the TUI

In this task you will leave a message for a subscriber on another Cisco Unity server within your organization using the telephone.

Exercise Procedure

Step 1   From the primary extension on your telephone dial into Cisco Unity and access your mailbox. After entering your password press **2** to leave a message.

Step 2   Spell out the name of a subscriber on another Cisco Unity server within your organization and leave that person a message.

Step 3   Confirm that the person has received the message.

Exercise Verification

You have completed this exercise when you attain these results:

The subscriber you left the telephone message for confirms they received it.

Task 4: Installing VMO and Creating an Outlook Profile

In this task you load the View Mail for Outlook client and configure an Outlook profile for a subscriber.

Exercise Procedure

Step 1   While logged on as the server account on your Cisco Unity server , click **My Computer**, and select the D Drive. On the D drive, click the **ViewMail** Folder, and then click the **Setup** icon**.**

Step 2   On the ViewMail Installation Wizard screen, click **Next.** Choose the language you wish to hear the VMO prompts in and click **OK.**

Step 3   At the Welcome to ViewMail for Outlook screen, click **Next**. On the Select Directory screen, click **Next**. (If asked, click OK to build the directory). The install program loads the software. When completed, click **Finish.**

Step 4   Log off your server using the server account. Log back on using the subscriber account you created earlier.

Step 5   On the desktop, double-click the **Microsoft Outlook icon**. If the Install Outlook Millenium Edition begins to run, click **Cancel**. In the lower right of the screen a User box will appear, click **OK**.

Step 6   The Microsoft Outlook Wizard begins. Check **Microsoft Exchange Server**. Leave the Internet Email box unchecked. Click **Next**.

Step 7   In the Microsoft Exchange Server field, type: `your Server#`(example `Server1`). In the logon box confirm your logon name is entered. If not, type it in. Click **Next.**

Step 8   Confirm No is selected to the question, "Do you travel with this computer?" Click **Next.** Click **Finish.**

Step 9   Click **No** when asked if you would like Outlook to be your default manager.

Exercise Verification

You have completed this exercise when you attain these results:

You double-click the Outlook icon on the desktop and your Outlook Inbox appears.

Task 5: Messaging within your Organization Using VMO

In this task you will leave a message for a subscriber on another Cisco Unity server within your organization using the VMO.

Exercise Procedure

Step 1 On the Outlook Tool bar, Click the **New Voice Message** Icon located on the far right of the tool bar.

Step 2 The ViewMail for Outlook form opens. Click **To** and select a subscriber on another Cisco Unity server**.** Highlight the subscriber's name and double click. The name appears in the Message Recipients field. Click **OK**.

Step 3 On the Media Master bar. click the **down options arrow**, and select your playback and record device. Click the **Red button** on the bar to record your message. In your message ask the recipient to send a response.

Step 4 Click **Send**.

Step 5 To listen to the response, double-click on the message in the Outlook Inbox and click the **Play button** on the Media bar.

Exercise Verification

You have completed this exercise when you attain these results:

You receive a response from the voice mail message you sent using VMO.