555-7101-100

CallPilot

Networking Planning Guide

Product release 2.5 Standard 1.0 October 2003

NORTEL NETWORKS™

CallPilot

Networking Planning Guide

Publication number:	555-7101-100
Product release:	2.5
Document release:	Standard 1.0
Date:	October 2003

Publication history

October 2003	Standard 1.0 issue of the CallPilot 2.5 *Networking Planning Guide* is released.

Contents

chapter 1

About CallPilot

This chapter introduces CallPilot, the powerful multimedia messaging system from Nortel Networks. CallPilot offers a single solution for managing many types of information, including voice mail, fax-mail, e-mail, telephone calls, conferencing, calendars, directories, and call logs.

CallPilot enables you to get all the information you need from one source, whether through display-based telephone sets, your wireless set, your Windows desktop computer, a speech recognition interface, or another personal communications device.

In this chapter

About this guide

In this section

Overview

Introduction

The *Networking Planning Guide* is the first guide in the CallPilot networking suite. The guide is intended to be read before any networking solution is implemented.

The *Networking Planning Guide* provides an overview of key concepts and terminology necessary to implement a messaging network. This guide introduces all of the networking solutions offered with CallPilot and describes specific feature interactions. This guide also explains the process that you follow to implement one or more networking solutions.

Assumptions

This guide assumes that the Meridian Application Server has been correctly installed and is operational. If the application has not been installed, then install it before proceeding. For installation instructions, refer to the hardware installation guide appropriate to your server type.

If the server has been installed but is not operational, refer to the *Maintenance and Diagnostics Guide* for information on troubleshooting your system.

Skills you need

Introduction

You need certain skills and knowledge to use this guide effectively.

Nortel Networks product knowledge

Knowledge of, or experience with, the following Nortel Networks products will assist you:

- previous releases of CallPilot
- Meridian Mail

PC experience or knowledge

Knowledge of, or experience with, the following PC products will be of assistance. This guide does not document the following functionality:

- Microsoft Windows NT
- Microsoft Windows 95
- Microsoft Windows 2000

Other experience or knowledge

Other types of experience or knowledge that may be of use include the following:

- switch configuration and operation (especially trunk group access restrictions [TGARs] and network classes of service [NCOS])
- network management
- client-server systems
- flowcharting
- troubleshooting

How this guide is organized

Introduction

The *Networking Planning Guide* provides an overview of key CallPilot concepts and terminology. This guide is designed to help you to understand and implement a messaging network.

Contents

The *Networking Planning Guide* contains the following chapters:

Chapter title	Description
Chapter 1, About CallPilot	This chapter describes how to work with the CallPilot interface and how to use this guide.
Chapter 2, Getting started	This chapter introduces networking and networking protocols. It also describes the key concepts necessary to understand messaging networks.
Chapter 3, Understanding CallPilot networking solutions	This chapter describes each the networking solutions, their features, and how they work. This chapter also provides detailed information about how each networking solution works.
Chapter 4, Dialing plans and networking	This chapter describes each dialing plan supported by CallPilot. This chapter also describes how to create a network representation using the dialing plan information.

Chapter title	Description
Chapter 5, Implementing CallPilot networking	This chapter describes how networking solutions are implemented. It describes the information that is required and describes where a networking solution is configured. This chapter stresses the importance of organizing all sites in the messaging network and coordinating information.

Related information products

Introduction

The following CallPilot technical documents are stored on the CD-ROM that you receive with your system. The documents are also available from the following sources:

- CallPilot Manager
- My CallPilot
- the Nortel Networks Partner Information Center (PIC) at http://my.nortelnetworks.com

  You require a user ID and a password to access the PIC. If you do not have a PIC account, click Register to request an account. It can take up to 72 hours to process your account request.

You can print part or all of a guide, as required.

Note: To order the documents that are available in printed format, contact your Nortel Networks sales representative.

Planning and migration guides

Use these guides before you install CallPilot to help plan your system, or to plan a migration of data from Meridian Mail to CallPilot:

Document title	NTP number
Installation and Configuration Planner	—
Planning and Engineering Guide	555-7101-101
What's New Guide	555-7101-901

Installation and configuration guides

The following guides describe how to install the following:

- CallPilot server hardware and software
- desktop messaging and My CallPilot software

Document title	NTP number
Desktop Messaging and My CallPilot Installation Guide	555-7101-505
Installation and Configuration Guide for your server model This is a binder that contains the following five documents: ■ *Part 1: Installation and Maintenance Overview* ■ *Part 2: <Server model> Server Hardware Installation* ■ *Part 3: <Switch name> and CallPilot Server Configuration* ■ *Part 4: Software Installation and Maintenance* ■ *Part 5: <Server model> Server Maintenance and Diagnostics*	Refer to the *CallPilot Installation and Configuration* binder for NTP numbers.

Administration guides

The following guides provide specialized information to help you configure administer and maintain CallPilot, and use its features:

Document title	NTP number
Administrator's Guide	555-7101-301
Reporter Guide	555-7101-310
Application Builder Guide	555-7101-325

Document title	NTP number
Desktop Messaging and My CallPilot Administration Guide	555-7101-503
Meridian Mail to CallPilot Migration Utility Guide	555-7101-801

Networking guides

The following guides describe how to plan, install, set up, and troubleshoot the CallPilot networking services:

Document title	CallPilot release	NTP number
Networking Enhancements Guide	2.0	555-7101-507
Networking Planning Guide	1.0	555-7101-100
NMS Implementation and Administration Guide	1.0	555-7101-302
AMIS Networking Implementation and Administration Guide	1.0	555-7101-303
Enterprise Networking Implementation and Administration Guide	1.0	555-7101-304
Integrated AMIS Networking Implementation and Administration Guide	1.0	555-7101-305
VPIM Implementation and Administration Guide	1.0	555-7101-306

Note: For instructions on how to configure the networking services on CallPilot, refer to the CallPilot Manager online Help.

End user guides

The following guides are intended for CallPilot end users, such as telephone set users and desktop messaging users:

Document titles
Unified Messaging Quick Reference Card
Unified Messaging Wallet Card
Unified Messaging What's New Card
Command Comparison Cards
Menu Interface Quick Reference Card
Alternative Command Interface Quick Reference Card
Multimedia Messaging User Guide
Speech Activated Messaging User Guide
Desktop Messaging User Guides
My CallPilot User Guide

Troubleshooting

The *CallPilot Troubleshooting Reference* describes symptoms that can appear on all CallPilot server platforms, and describes ways to resolve them.

The *CallPilot Troubleshooting Reference* is intended for Nortel Networks distributors and technical support representatives; therefore, it is not part of the customer documentation package. Nortel Networks continually updates the *CallPilot Troubleshooting Reference*, which is available from the Nortel Networks Partner Information Center (PIC) at http://my.nortelnetworks.com.

You require a user ID and a password to access the PIC. If you do not have a PIC account, click Register to request an account. It can take up to 72 hours to process your account request.

Note: If you are not a Nortel Networks distributor, then contact your Nortel Networks technical support representative for assistance.

Using online sources

CallPilot administration online Help

The CallPilot Manager and CallPilot Reporter software contain administration online Help areas that provide access to

- technical documentation in Acrobat PDF format
- online Help topics in HTML format

To access online information, use either of the following methods:

- Click the orange Help button at the top of any page to access the Administration Help area.
- Click the grey Help button on any page to display a topic that relates to the contents of the page.

For more information about using these Help systems, access the CallPilot Manager Help, open the Getting Started book, and click “Navigating CallPilot Manager Help.”

The Application Builder software contains a Windows Help system as well as context-sensitive Help (available by clicking the ? button and then a field or label).

CallPilot end-user online Help

The My CallPilot software contains a Useful Information area that provides access to the end-user guides in PDF format.

To access online Help for the currently selected My CallPilot tab, click the Help button on the upper-right corner of the My CallPilot page.

Desktop messaging provides product-specific Windows Help for groupware clients (Microsoft Outlook, Novell GroupWise, and Lotus Notes). The stand-alone version of CallPilot Player also provides addressing and troubleshooting information for Internet mail clients.

Contacting technical support

Contact your distributor's technical support organization to get help with troubleshooting your system.

Conventions

Commands documented in procedures

As in many other Windows-based applications, in CallPilot you can execute a command in several ways. For example, to copy text you can choose any of the following methods:

- Select Copy from the Edit menu.
- Click the Copy button on the toolbar.
- Type the keyboard shortcut Control + C.

The procedures in this guide use only the first method: selecting a command from a menu.

Navigation information in procedures

A **Getting there** statement precedes each procedure in this guide. This statement summarizes the steps you must take to navigate to the window or tab where you carry out the procedure.

All **Getting there** statements start at the Nortel System Management Interface (SMI) window. This assmues that you logged on and selected the appropriate system. Eac item mentioned after the Nortel SMI window represents an icon, window or tab that makes up the path to the final destination.

Example

To define special mailboxes, such as the broadcast mailbox, you must be on the Mailboxes tab.

Getting there Nortel SMI > Meridian Application Server > CallPilot > Message Administration

After you double-click Messaging Administration, the Message Administration Properties sheet displays. Click the Mailboxes tab.

Finding your way around CallPilot

In this section

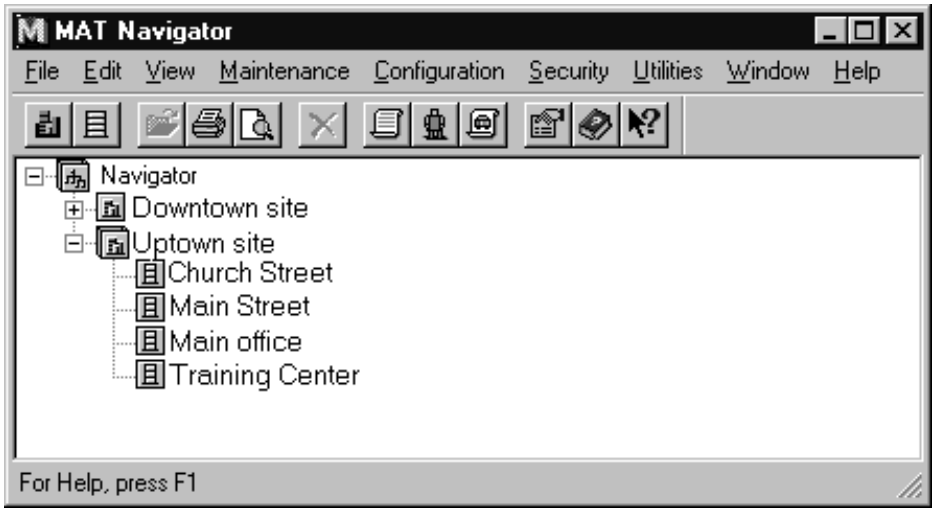
Connecting to CallPilot

Introduction

To perform administrative tasks, or to build or work with CallPilot applications, you must first connect to the Meridian Application Server (the MAS server). The MAT Navigator and the System Management Interface (SMI) work together to give you access to your system and sites.

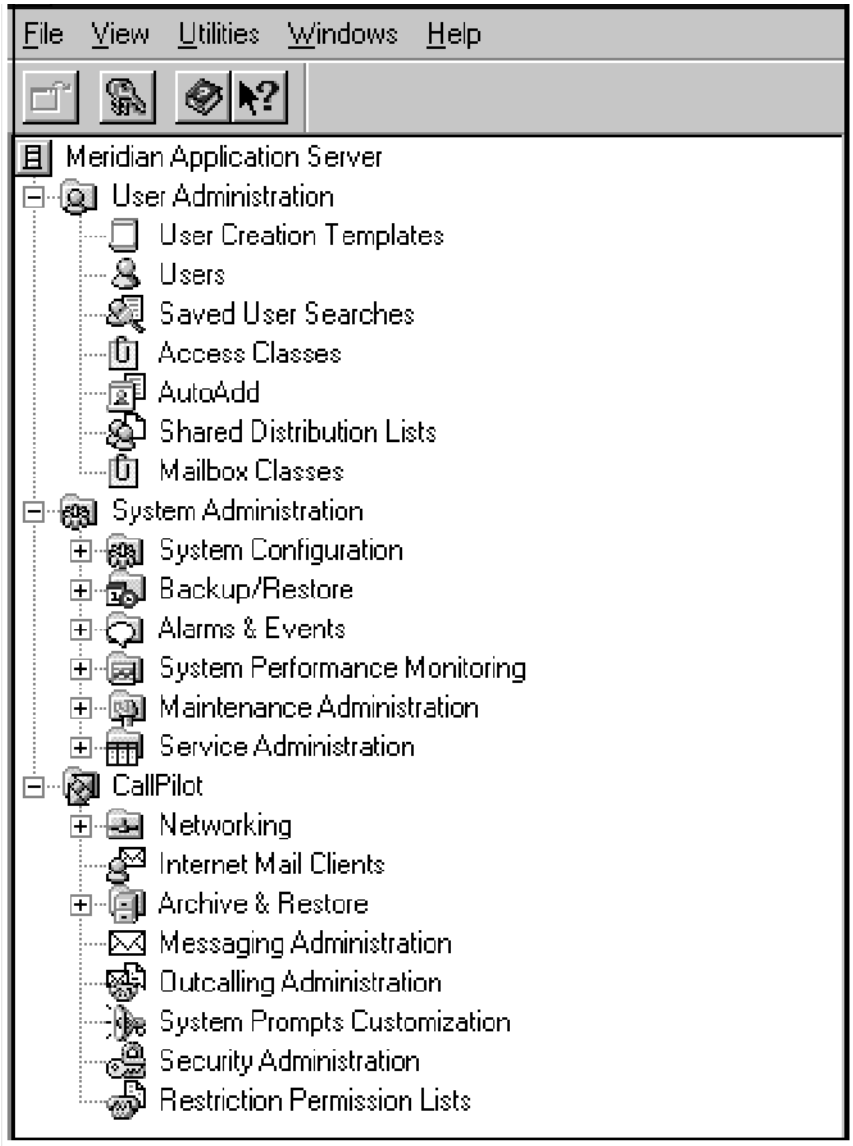
Selecting a system-the MAT Navigator

The first step in logging in is to launch the MAT Navigator, which has its own password. The MAT Navigator connects your administration client to the MAS server. It displays all your sites and systems and enables you to select one to work on.



Selecting a program—the System Management Interface (SMI)

When you select a system from the MAT Navigator, you are prompted for a second password. At this point, the SMI window for the selected system or site displays.



The SMI gives you quick and easy access to your system or sites. The SMI uses a navigation tree to display the system's hierarchy. In the tree, icons represent the folders and programs. Double-click a folder icon to view its contents. Folders can contain programs and other folders. Double-click a program icon to run the associated program.

Selecting an object-list views

When you launch certain programs, the first thing you see is a list view. The list view displays all the objects of a certain type (such as mailbox classes) that are currently defined in the system. The list view includes predefined objects as well as those defined by an administrator. From the list view window, you can select a specific object to work on.

Viewing and changing properties

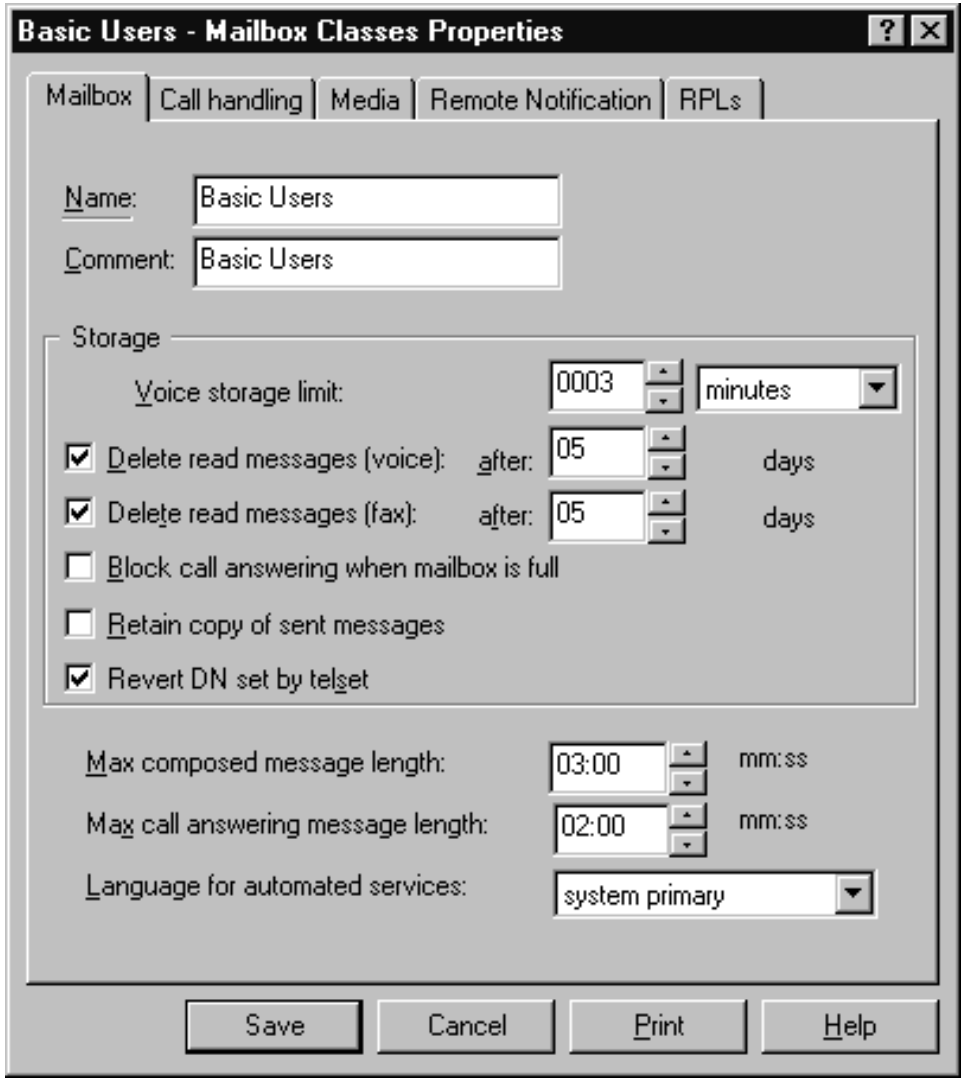
Select an object and display its properties by

- double-clicking it or
- single-clicking it and selecting Properties from the File menu
- right-clicking it and selecting Properties from the popup menu

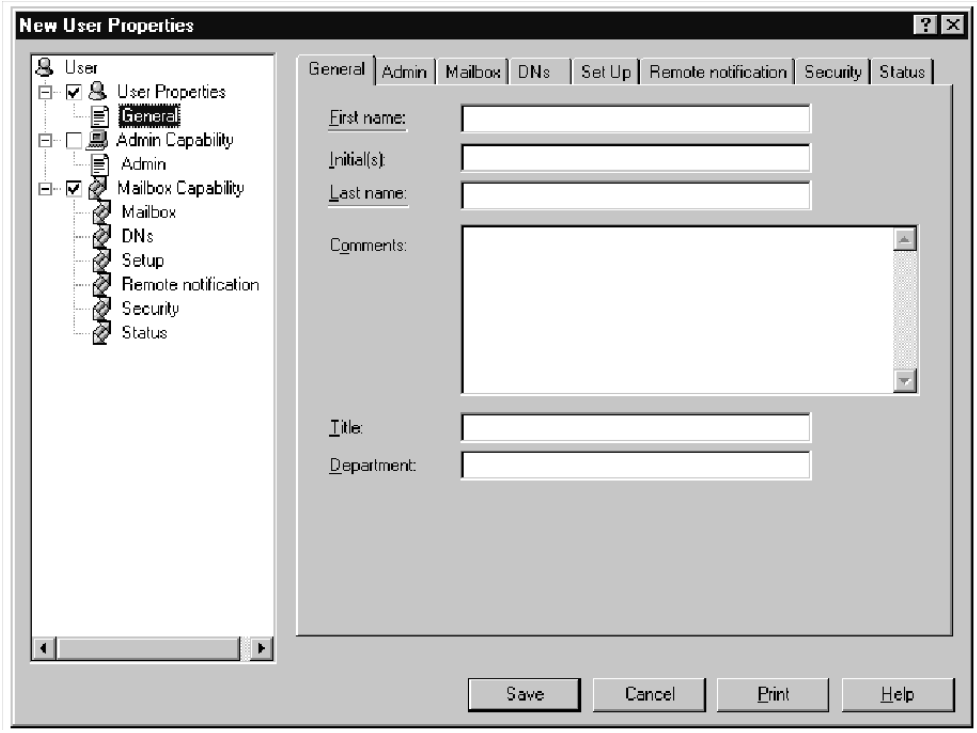
Entering data and choosing options-property sheets

A property sheet is displayed when you view an object selected from a list view. Certain programs, such as Messaging Administration, display a property sheet immediately after launching. Property sheets have one or more tabs. Each tab has fields, referred to as boxes, in which you can type data or from which you can select options.

Most CallPilot property sheets look like the following:



Some property sheets are divided into two panes. When a box is checked in the left pane, the selected capabilities are enabled and you can access the associated tabs. Select a tab by clicking its name in the left pane or by clicking the tab in the right pane. These property sheets look like this:



Mandatory boxes

If the name of a box is underlined, the box is mandatory, and you must fill it in. You cannot save if any mandatory boxes are empty.

Common buttons

The following buttons appear on most property sheets:

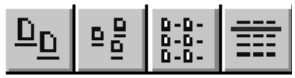
Button	Description
Save	Saves all changes made on any of the tabs in a property sheet and closes the property sheet. Therefore, save only when you have made the necessary changes on all tabs.
Cancel	Closes the property sheet without saving any changes.
Print	Prints the contents of all tabs in the property sheet.
Help	Displays Help for the current tab. From this overview Help topic, you can access other Help topics, the index, and the search function.

Using the toolbar buttons

For easier access, some of the more common tasks, such as Print and Save, are represented as buttons on the toolbar.

The following buttons are used throughout CallPilot. Buttons or icons specific to certain CallPilot functions, such as backups and archives, are documented in the relevant chapters.

Toolbar button	Description
	Saves any changes you have made and then transfers all the application's data to the server.
	Opens the Print dialog box and prints the active file or the objects you specify.
	Deletes the object you select.

Toolbar button	Description
	Displays the properties of the object you select.
	Displays the Help topics window.
 	Explains the next menu item or screen object you click. In a window, there is an arrow. On tabs or in dialog boxes, there is no arrow.
 	Opens the New dialog box, where you identify the properties of the object you are creating. The button looks different in different applications.
 	Displays the Open dialog box, where you select an object to open. The button is different in different applications.
	Reloads the current page and displays the changes you have made.
	Enables you to select how the system displays icons.

Multi-administrator access

Introduction

You can create multiple administrator accounts to make administering CallPilot easier and more efficient. Multiple accounts enable administration responsibilities to be distributed among a number of people. Therefore, certain administrators can specialize in certain tasks, such as maintaining users, performing backups, analyzing reports, or creating multimedia services.

Access classes

For security reasons, administrators should be given access only to those parts of the system that relate to their role. For example, an administrator who is responsible only for creating multimedia services should have access only to Application Builder and the Service Directory Number Table.

Each administrator account is assigned an access class. An access class is a list of the parts of the system and the level of access allowed. The access levels are as follows:

- create/delete (enables an administrator to delete objects such as users and services)
- edit
- view
- none

For example, an administrator may be able to create or delete objects in Application Builder but only view User Templates.

Simultaneous access

Multiple administrators can log in to CallPilot at the same time without overwriting other work.

If you are the first to log in to a particular resource, such as a specific mailbox class or user profile, and another administrator tries to access the same resource, a dialog box appears to inform you of the other administrator. At this point, you can do one of the following:

- Keep editing.
- Save your changes, and release the resource to the other administrator.
- Cancel your changes, and release the resource to the other administrator.

If you do not respond to this prompt within two minutes—because you are away from the terminal, for example—the system releases the resource so that others can access it. If this happens, all your unsaved changes are lost.

An administrator who accesses a resource that is currently being edited sees a read-only view of the property sheet in which all boxes are dimmed. This indicates that the resource is currently locked. The administrator is not notified when the resource is released, but must try to access the property sheet again to see whether its status has changed.

If a user tries to log on to a mailbox while an administrator is changing the profile, the user is unable to log on and receives a message that says the mailbox is in use.

Refreshing screens

Because multiple administrators can access the same database at the same time, a Refresh command is available from the View menu to ensure that the view you are seeing is the most up-to-date.

For example, if you are viewing a list of users when another administrator deletes a user, the only way to see the change is to refresh the screen. You should, therefore, refresh the screen regularly.

Error handling in property sheets

Introduction

If you make certain types of errors while entering data, you are not able to save your changes until you correct the errors. For example, if you leave a mandatory box empty, you receive a message prompting you to fix it.

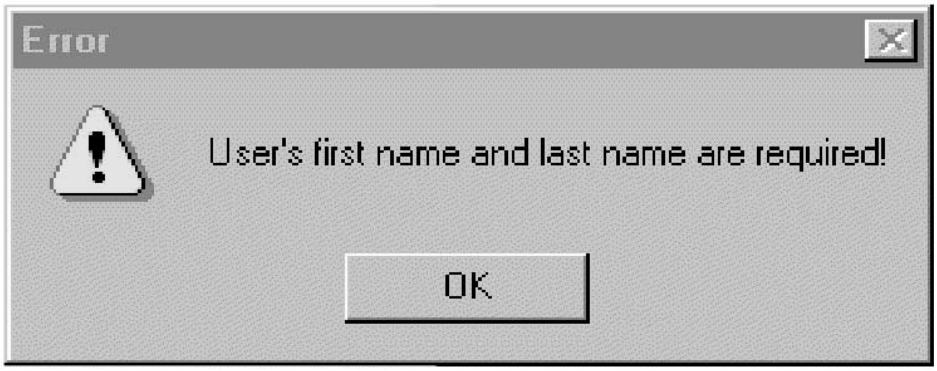
Note: These errors do not show up in the Event Browser or Alarm Monitor because the errors relate only to data entry and are not operational problems.

How error handling works

There are two types of error messages.

Type 1

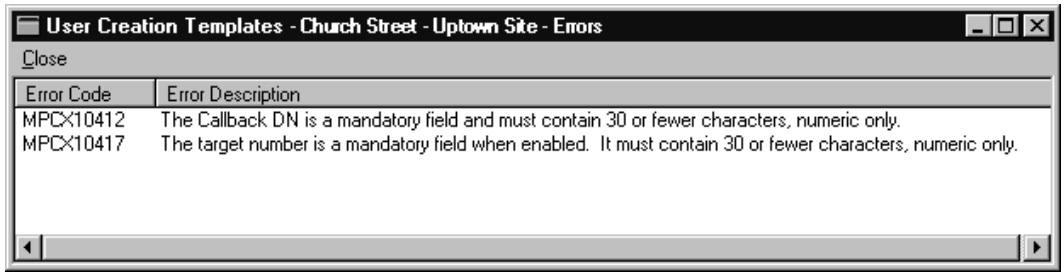
If you get this type of error message, click OK, and then fix the problem described in the message before you try to save again.



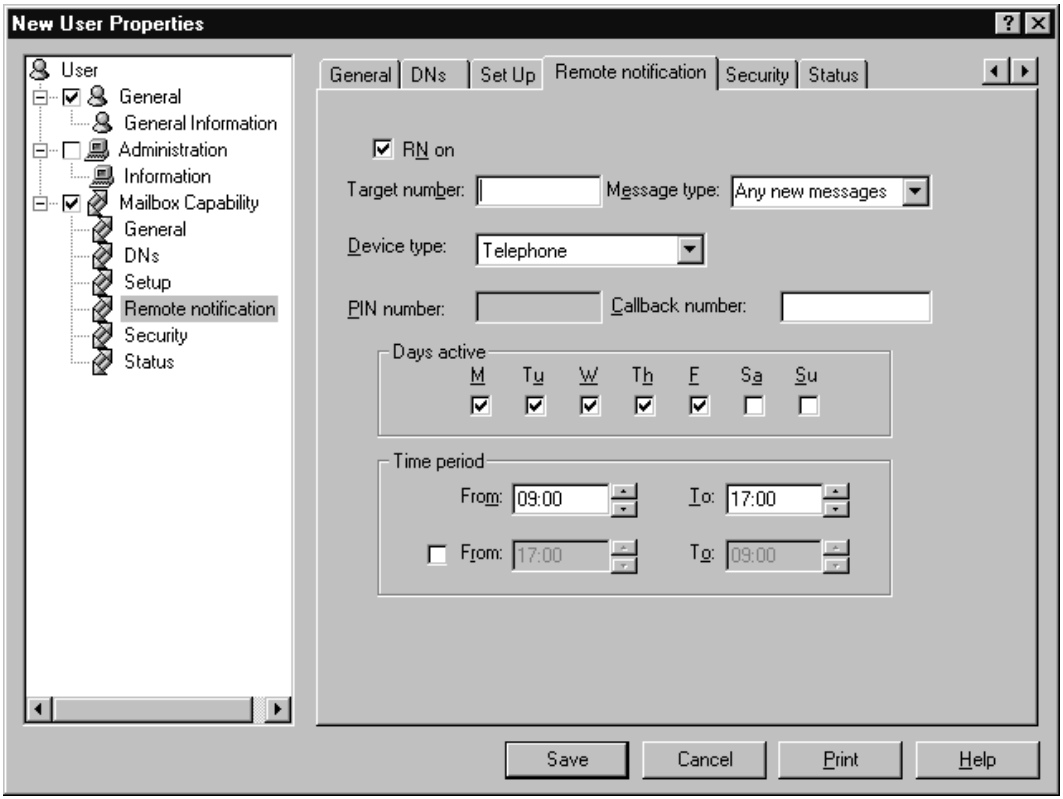
Type 2

If you get this type of error message, click OK to see a list of errors.

Double-click an error from the list. Your cursor is automatically placed in the box where the error was made so that you can correct it.



For example, if you double-click the second error, the Remote notification tab is displayed, with the cursor in the Target number box.



Using the online Help

Introduction

While administering or maintaining CallPilot, you may have questions about the purpose of certain boxes and buttons, or need more information about completing certain tasks. Online Help provides brief answers to the questions "What's this?" and "How do I...?"

Context-sensitive Help

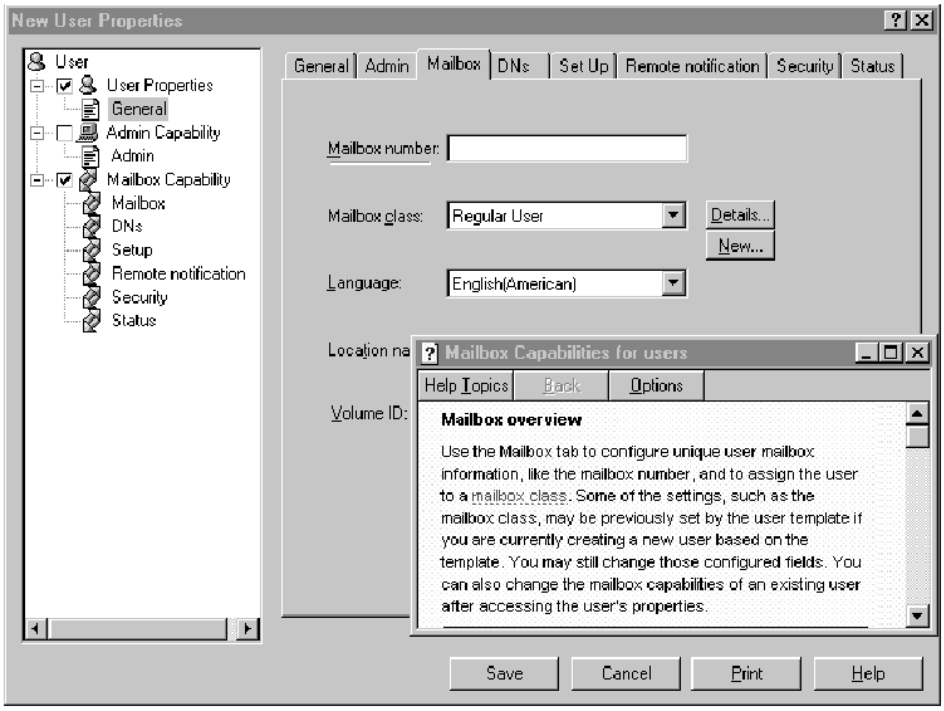
If you need to know the purpose of a particular box or button, use context-sensitive Help.

To access context-sensitive Help

1 Click the  icon in a window or the  icon on a tab or in a dialog box.

2 Point to the box or button for which you want more information, and click.

Result: A pop-up description of the selected object is displayed.



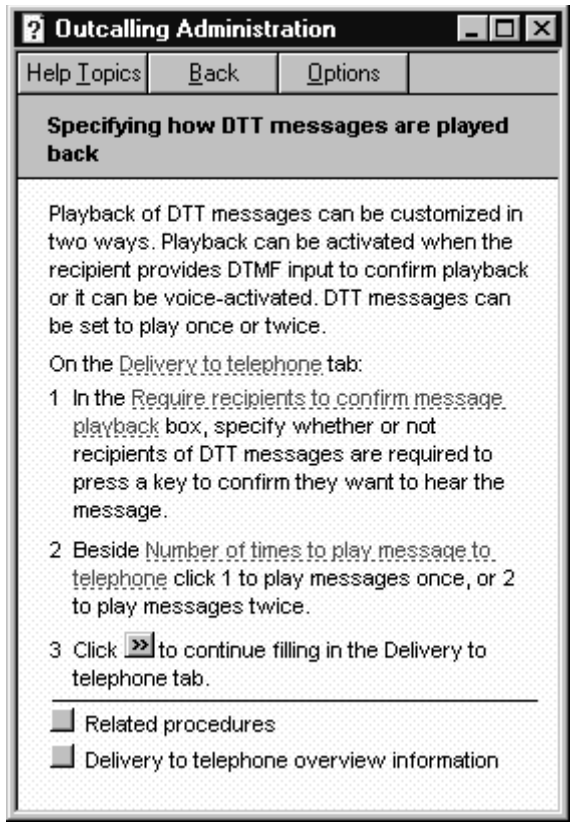
Procedures

If you need to know how to do something, you can access procedures to lead you through a task.

High-level tasks

In some cases, high-level tasks take you through longer procedures. These tasks also provide you with navigation to the step-by-step procedures they include.

For example, setting up Delivery to Telephone requires several procedures. The high-level task summarizes these procedures. You click the gray buttons within the task to open the step-by-step procedures. The high-level task remains on your screen so that you can continue to use it to move through the procedures.



Overview topics

Overview topics provide brief descriptions of tabs, features, and the tasks carried out from the tabs. However, the online guides contain more detailed feature descriptions.

To access overview topics

Click the Help button on a tab.

To find information in Help

You can look up procedures and overview topics in the following ways:

1 From the Help menu, select Help Topics.

Note: You can also press F1 on the keyboard.

2 Go to one of the following tabs:

- To see the table of contents of all the Help topics, select the Contents tab.
- To look up a subject alphabetically, select the Index tab.
- To do a full-text search to find topics that contain the words you enter, select the Find tab.

chapter 2

Getting started

This chapter introduces some basic networking concepts and terms that are necessary to understand CallPilot messaging solutions.

In this chapter

About networking and networking protocols

In this section

Overview

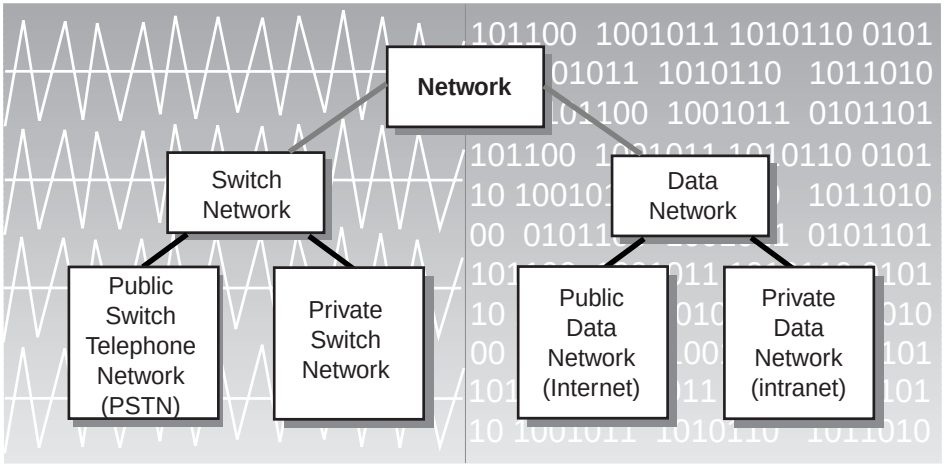
Introduction

Basic networking concepts and terms are a useful background for CallPilot messaging networks.

Definition: Network

At its simplest, a network is a communication system that connects two or more sites. A network allows users at all sites to exchange information and to share specified resources.

Data networks and switch networks are two of the most common types of networks. Both types can be either public or private.



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Definition: Switch network

Traditionally, telephone systems have been organized into switch networks.

There are three basic parts to a switched network:

- terminals (such as telephones or computers)
- transmission links (such as lines or trunks)
- one or more switches

In a switch network, a physical line is used to carry signals between the sender and the receiver. The sender uses a terminal and connects to a series of private and public telephony switches that terminate at the terminal of the receiver. The path of connection is maintained for the duration of the call and is destroyed when the call is completed. The signals are delivered in their original order.

Public switched network

If the switched network is maintained by a telecommunications service provider and is used by more than one customer, it is considered the public switch network. The public switched telephone network (PSTN) is the public telephone network used around the world.

Private switch network

If the switched network is privately owned and operated, and its use is restricted, it is considered a private switch network.

Definition: Data network

A data network is a communication system that enables two or more computers to communicate with each other and share resources.

In a data network, a stream of communication, such as a spoken message, is broken down into a series of packets. These packets contain information that identifies their origin, their intended recipient, and their correct order. The packets are routed through a network and are reconstructed, in their proper order, at their destinations.

There are many types of data networks, including local area networks (LANs), wide area networks (WANs), metropolitan area networks (MANs), and global area networks (GANs).

Public data network

A data network can make use of the publicly available infrastructure to transmit information. The Internet is an example of a public data network.

Private data network

A data network can be privately controlled. An intranet is an example of a private data network.

Definition: Messaging network

A network that exists for the purpose of exchanging messages is called a messaging network.

When you implement any of the CallPilot networking solutions, you are creating a messaging network.

Messaging networks are built on an existing switch or data network infrastructure. The existing structure is often called the backbone. A messaging network is usually private, although it is possible to exchange messages with sites that are not within the private messaging network.

Network setup

Introduction

All networks have a physical set that determines how the network operates.

The setup of a messaging network is an important factor in determining how you implement networking solutions and how users are able to exchange messages. The network setup consists of the sites and the connections between them. This setup is often called a network topology.

Possible setups

CallPilot supports different network setups to ensure that your messaging network is designed for the specific needs of your organization.

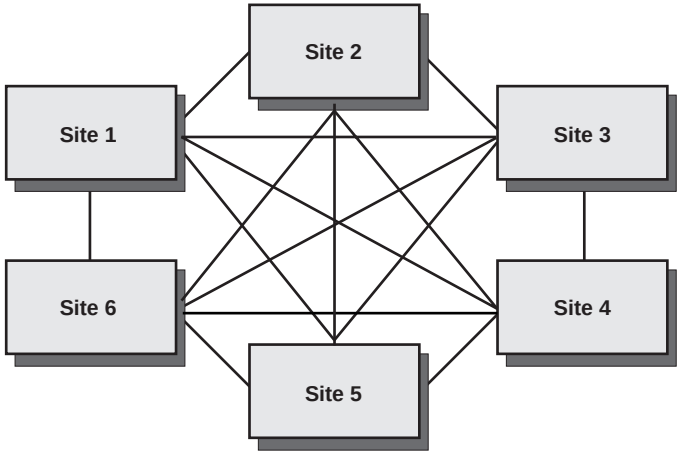
Two common types of network setup are the mesh network and the non-mesh network.

Mesh network

One of the most common network setups is the mesh network. In a mesh network, every site is connected to every other site in the messaging network.

For small messaging networks, a mesh setup is common. Every site can exchange messages with every other site in the network.

The following diagram shows a small mesh network:



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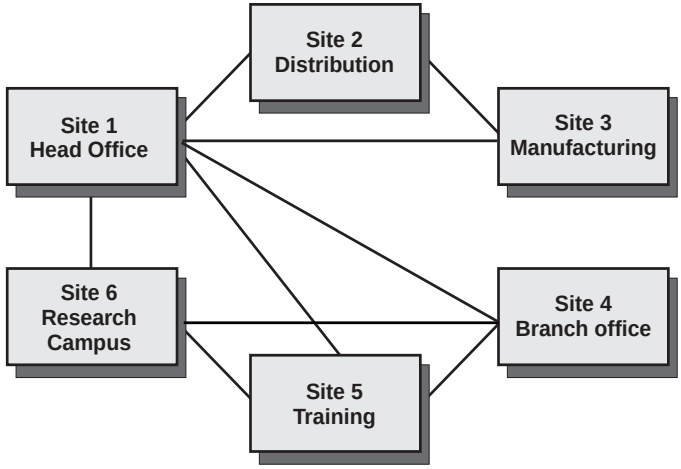
Non-mesh network

For larger messaging networks, a mesh network may be impractical or unnecessary. In fact, in most messaging networks, a site is connected only to those remote sites with which it commonly exchanges messages.

The following diagram illustrates a non-mesh network. In this example, only the head office is connected to every other site. All other sites are connected only to those sites with which messages are exchanged. The manufacturing center, for example, is connected only with the distribution center and the head office.



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This type of network setup also greatly simplifies the implementation and administration of the messaging network. Site 1 is the most complicated site to administer, because records for all other sites must be maintained. Site 3, however, is much simpler to administer, because records for only the two sites with which messages are exchanged must be maintained.

Protocols

Introduction

Communication among sites in a messaging network is achieved by protocols.

Definition: Protocol

A protocol is a set of rules that defines how sites exchange information.

A protocol must be used to exchange information between transmitting and receiving sites.

Types of protocols

CallPilot uses two types of protocols for exchanging messages: analog and digital.

Analog protocols are used over switch networks. Digital protocols are used over data networks.

Within these two main categories there are both industry-standard and proprietary protocols.

Industry-standard protocols

Industry-standard protocols are based on industry-recognized rules and conventions.

Proprietary protocols

Proprietary protocols are based on specifications defined by a closed group or organization for its own use within its own products.

Analog and digital protocols

Introduction

A network can use analog protocols and digital protocols.

Analog protocols

Analog protocols send signals—voice, video, or images— that are similar to the original signal.

CallPilot supports two analog protocols:

- **Audio Messaging Interchange Specification–Analog (AMIS-A)** Issued in 1990, AMIS-A is an industry standard that allows the voice messaging systems produced by different vendors to exchange voice messages.
- **Enterprise Networking** Nortel's proprietary protocol for analog transmission of voice messages. Enterprise Networking is an extension of AMIS-A and adds many important improvements, including longer voice message length and the ability to address a single message to multiple recipients.

Digital protocols

Digital protocols convert analog signals into binary format and amplify them before transmission.

CallPilot supports several Transport Control Protocol/Internet Protocol (TCP/IP) application protocols, which are a specific family of digital protocols.

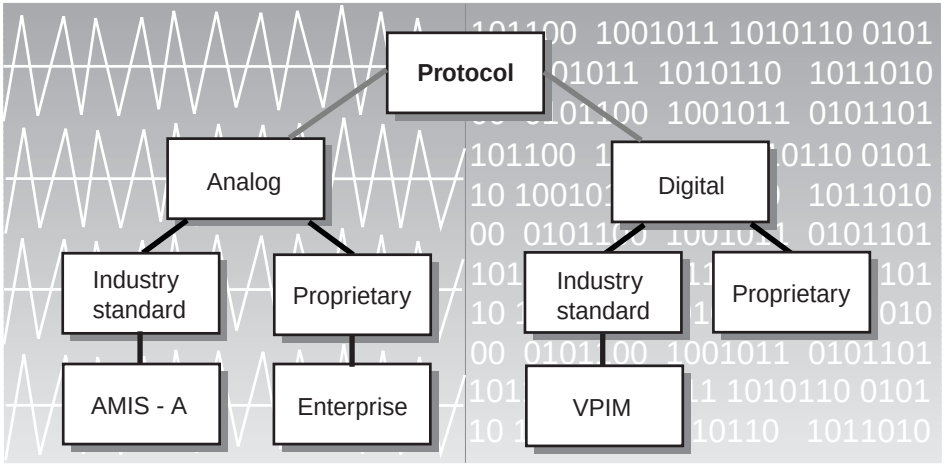
The TCP/IP application protocols used are

- **Simple Message Transfer Protocol (SMTP)**
  A protocol for sending electronic mail (e-mail).
- **Multipurpose Internet Mail Extensions (MIME)**
  A means of representing the format of multimedia messages, including graphics, audio, and text files, over the Internet.

Voice Profile for Internet Mail

Voice Profile for Internet Mail (VPIM) is a profile that specifies the use of SMTP as the message transfer protocol and the use of MIME to format messages. CallPilot uses the SMTP and MIME protocols in compliance with industry-standard specifications.

Protocol hierarchy



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Analog and digital protocols compared

In an analog transmission, the signal may pick up stray or random noise. Messages sent with analog protocols may become degraded when they are forwarded, because of rerecording.

In a digital transmission, the signal does not pick up stray noise and may be cleaner than an analog signal.

Because computers use digital information, digital protocols allow telephone messaging to use the latest technologies available, including greater integration with electronic messaging, such as fax and e-mail, and desktop applications. Messages consist of digital parts that contain different media, including voice, fax, and text.

Digital messages are less expensive than analog messages because no long-distance toll charges are currently associated with the Internet.

Messaging networks

In this section

Networks and messaging

Definition: Messaging

Messaging is the exchange of information. Messaging is a common function of a network.

Definition: Messaging network

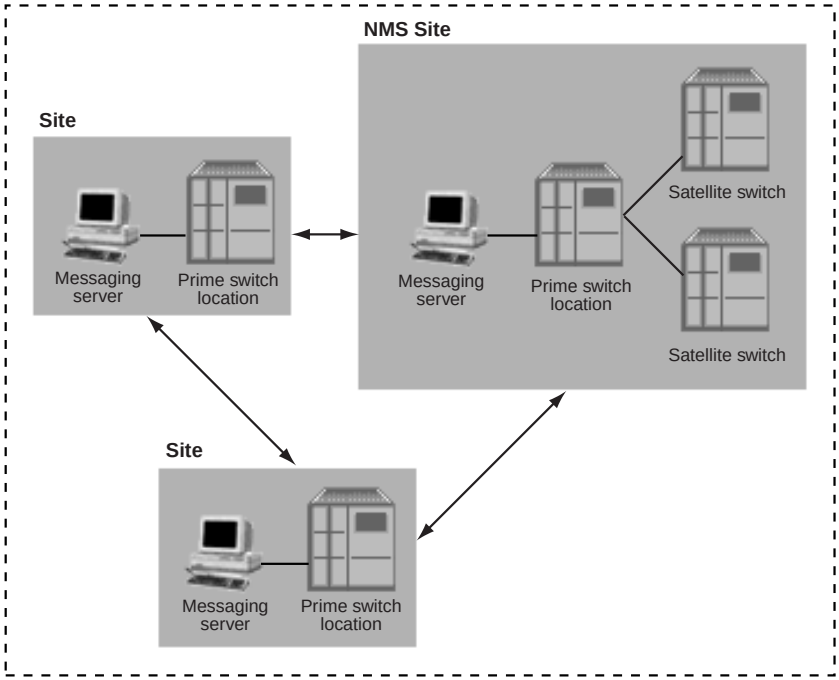
CallPilot enables networks to function as messaging networks. A messaging network is a private network, whether data or switch, that allows users at one site to send messages to and receive messages from users at other sites.

In the past, it was common to talk about voice messaging systems. However, the contents of the messages are no longer limited to voice. Today, it is common to talk about multimedia messaging systems.

CallPilot handles voice, fax, and text messages. Messages are sent and received through the telephone, the computer desktop, or a combination of both.

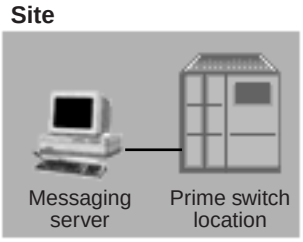
Sites and connections

A messaging network consists of sites and connections. Connections are the agreed-upon protocols used between two sites.



Definition: Site

In a messaging network, a site consists of a messaging server and a prime switch location.



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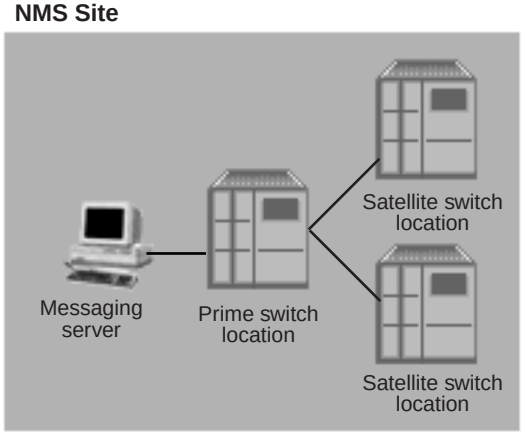
The messaging server is the computer that is running CallPilot. The network database resides on the messaging server.

The prime switch location is the switch that is directly connected to the messaging server.

NMS site

If a site has Network Message Service (NMS) implemented, it is called an NMS site. An NMS site consists of a messaging server, a prime switch location, and up to 59 satellite switch locations.



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Implementation is incremental

A messaging network is constructed on top of existing switch and data networks. A CallPilot messaging network is an incremental installation. It is implemented only when the switch and data networks are already in place.

To implement a messaging network is basically to create a network database that contains information about the sites included in the messaging network and how they will communicate with one another.

Network database

Introduction

The network database is the foundation of a CallPilot messaging network.

Every site in a messaging network has its own network database. A network database resides on the messaging server.

Contents

The network database for a site contains information about the local site and all the remote sites with which the local site exchanges messages.

Local site information

A network database contains the following types of configuration information for the local site:

- local messaging network configuration
- local messaging server
- local prime switch location
- local satellite switch locations, if an NMS site

Remote site information

A network database also contains the following types of configuration information for each remote site with which the local site exchanges messages:

- remote messaging server
- remote prime switch location
- remote satellite switch locations, if an NMS site

When this information about a remote site is added to a local network database, it becomes an integrated site.

Network database and the implementation process

When you implement a CallPilot networking solution, you add information to the network database.

Integrated and open sites

Introduction

Messaging networks exchange messages with two types of remote sites: integrated sites and open sites. Whether a remote site is integrated or open depends on how the local network database is configured.

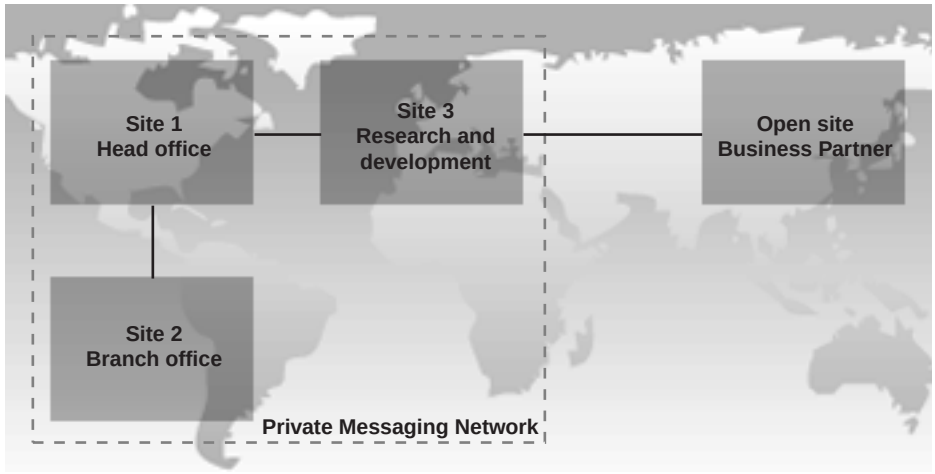
Integrated site

A remote site is integrated if information about it is added to the local network database.

Open site

A remote site is open if information about it is not added to the local network database. In most instances, an open site is a site that is not part of the private messaging network.

In the following diagram, a small company has a private messaging network consisting of three integrated sites. Users at the research and development center frequently exchange messages with users at a business partner's site. This business partner is an open site.



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Protocols and open sites

The exchange of messages with open sites is possible through the use of industry-standard protocols. By using industry-standard protocols, systems can exchange messages regardless of the hardware platforms. Communication is possible if both systems use the same protocol.

Two CallPilot networking solutions exchange messages with open sites:

- AMIS Networking—over a switch network
- VPIM Networking—over a data network

Integrated and open messaging networks

A private messaging network consisting of integrated sites is self-contained but is built on the infrastructure of switch and data networks, both public and private. The ability to exchange messages with open sites means that users can go beyond the integrated network, into switch and data networks, both public and private.

Exchanging messages in open messaging networks

The concept of open sites does not imply that a user in a private messaging network can automatically exchange messages with other systems that use the same industry-standard protocol.

Instead, an open site indicates that there is potential for users at the sites to exchange messages if they agree to do so and set up their networks to accept the communication.

When networking solutions that can exchange messages with open sites are implemented, access to open sites can be restricted.

Combining open and private sites

Many large messaging networks consist of integrated sites but can also exchange messages with open sites. Within an organization, it may be important to have messaging capabilities with external sites as well as internal sites.

chapter 3

Understanding CallPilot networking solutions

This chapter introduces the CallPilot networking solutions. This chapter lists the features of each solution and describes interactions with other CallPilot features. The characteristics of each solution are also detailed.

In this chapter

About CallPilot networking solutions

In this section

Overview

Introduction

CallPilot offers a range of coordinated messaging networking solutions that provide great flexibility and service.

CallPilot networking solutions

CallPilot offers five networking solutions:

- AMIS Networking
- Integrated AMIS Networking
- Enterprise Networking
- VPIM Networking
- Network Message Service (NMS)

AMIS Networking

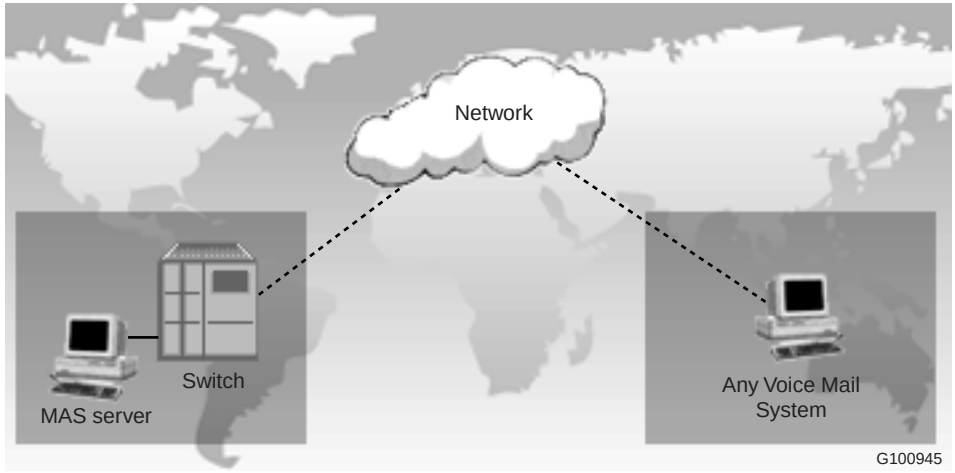
Introduction

AMIS Networking uses the industry-standard analog Audio Messaging Interchange Specification (AMIS) protocol.

AMIS Networking allows users to exchange messages with users of any voice messaging systems that support the AMIS protocol.

AMIS Networking is usually used to exchange messages with open sites that are not part of the private messaging network.

AMIS Networking uses dual-tone multifrequency (DTMF) tones to send information. AMIS Networking supports voice messages but does not support fax and text messages.



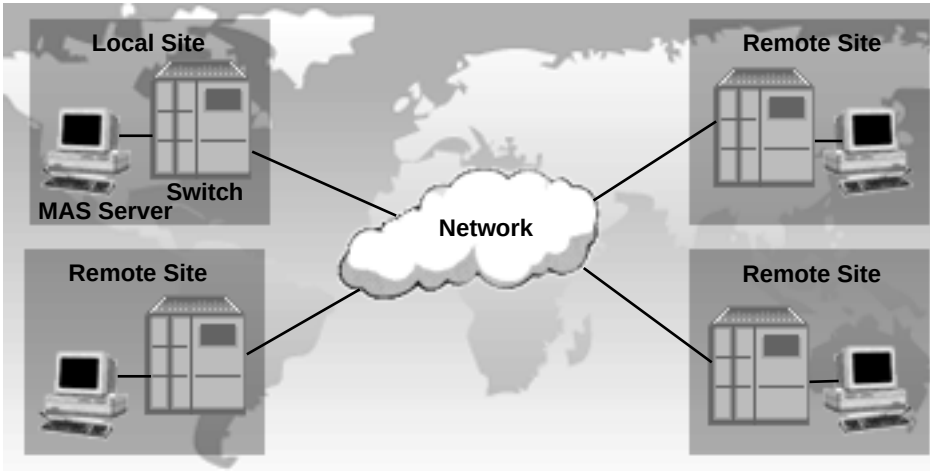
Integrated AMIS Networking

Introduction

Integrated AMIS Networking uses the industry-standard analog Audio Messaging Interchange Specification (AMIS) protocol.

When a remote site that uses the AMIS protocol is defined within the local network database, it is called an integrated site.

Remote sites may use any voice messaging system that supports the AMIS protocol.



AMIS Networking and Integrated AMIS Networking

AMIS Networking is used to exchange messages with open sites.

Integrated AMIS Networking uses the same protocol as AMIS Networking and offers the same functionality. However, Integrated AMIS Networking is used to exchange messages with integrated sites.

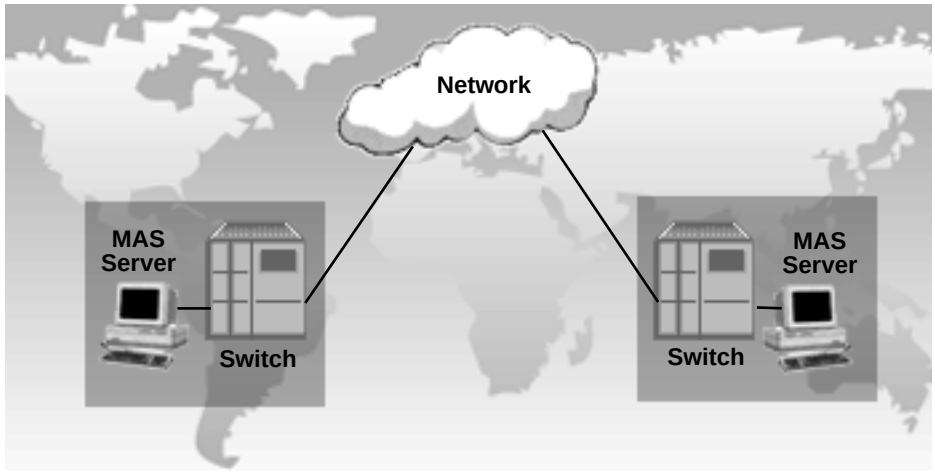
It is important to note that the functionality of AMIS Networking is contained within Integrated AMIS Networking. This means that if you implement Integrated AMIS Networking, users can also, if allowed, exchange messages with open sites.

Enterprise Networking

Introduction

Enterprise Networking uses the Enterprise Networking protocol. The Enterprise Networking protocol is based on proprietary extensions to the AMIS protocol. Enterprise Networking offers many advantages over AMIS Networking.

Enterprise Networking uses dual-tone multifrequency (DTMF) tones to send information. Enterprise Networking supports voice messages but does not support fax and text messages.



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Advantages

The Enterprise Networking protocol offers several advantages over the AMIS protocol.

Feature	AMIS protocol	Enterprise Networking protocol
Multiple recipients	Sends one message to each recipient; requires greater system resources and long-distance toll charges	Sends a single message to multiple recipients; requires less system resources and lowers long-distance toll charges
Message length	8-minute maximum	120-minute maximum
Security	Uses no special security features	Uses initiating and responding passwords between the sending and receiving sites before exchanging messages
Increased features	Limited feature availability	Supports additional features such as message privacy, message read acknowledgments, sending text information, and Names Across the Network.

VPIM Networking

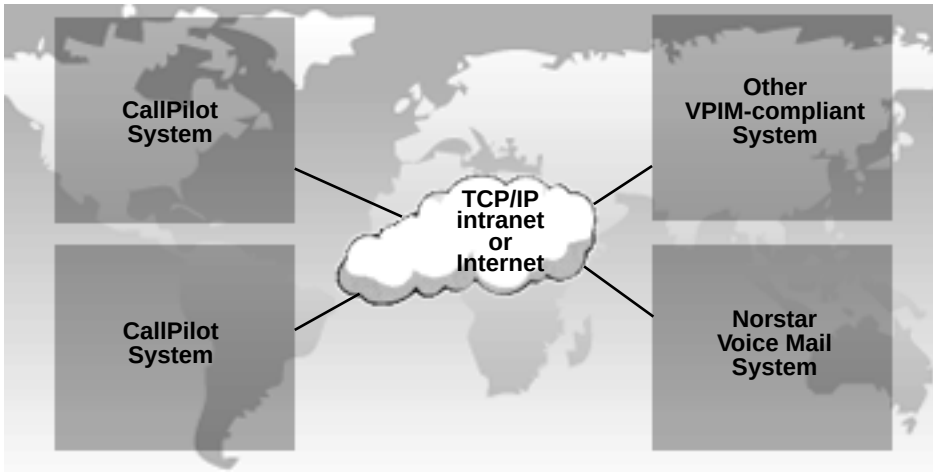
Introduction

VPIM Networking provides CallPilot with the capability to exchange multimedia messages using a standard data communications network. VPIM Networking can exchange messages with any other system that uses the same data communications protocol, regardless of vendor.

VPIM Networking formats and sends messages using industry-standard application protocols. Messages are sent across either a private data network, such as an intranet, or a public data network, the Internet, for delivery.

VPIM Networking allows messages to be exchanged with both open and integrated sites. For VPIM Networking to work within a private network, the destination must support VPIM and be in the local network database.

Because VPIM Networking transmits messages over data networks, the messages do not incur long-distance toll charges.



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Network Message Service

Introduction

Network Message Service (NMS) permits one CallPilot messaging server to provide messaging services to users on more than one switch location.

The CallPilot messaging server is directly connected to a prime switch location. Up to 59 satellite switch locations can be attached to the prime switch location. The CallPilot messaging server provides messaging services to all switch locations.

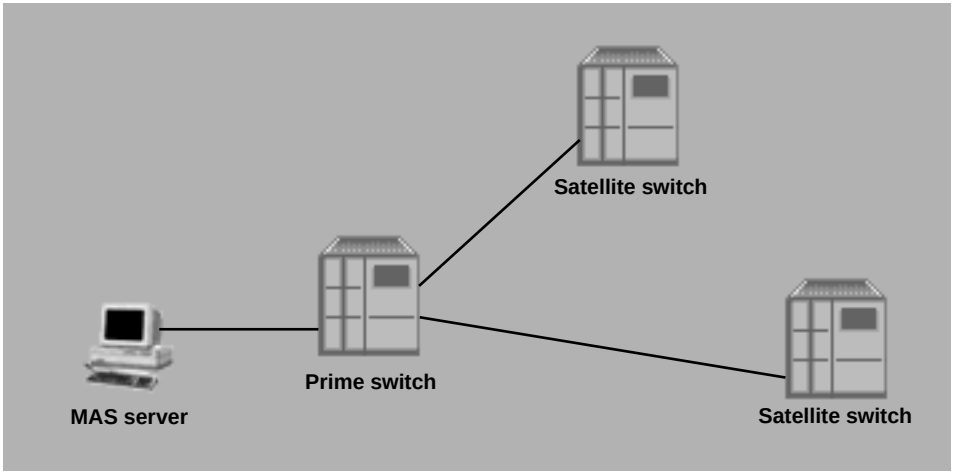
NMS and users

NMS is transparent to users. A user whose telephone or desktop is attached to a satellite switch location can receive the same services as a user attached to the prime switch location. All users dial the same way to reach the same services.

NMS networks and NMS sites

The collection of switch locations, connections, and the messaging server is known as an NMS network.

If an NMS network is a site in a private messaging network, it is called an NMS site.



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Combining networking solutions

Introduction

A messaging network can combine several networking solutions.

Many messaging networks are combinations of several solutions at various sites. In addition, one or more of the sites in a messaging network can be NMS sites.

This ability to combine networking solutions allows you to optimize your messaging network and create a customized solution for different business requirements.

Multiple solutions

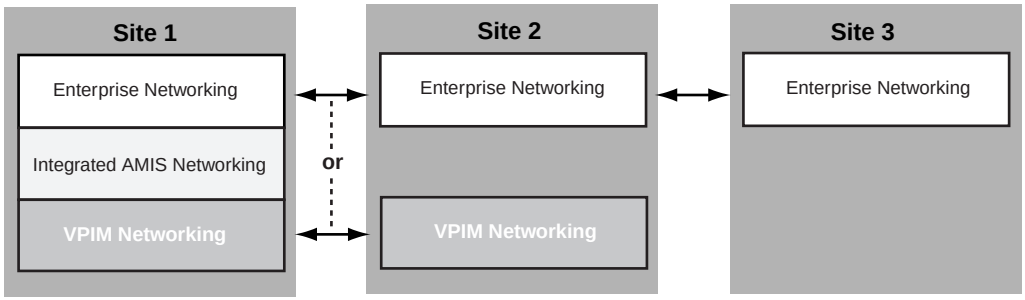
You can implement several networking solutions at one site.

However, to exchange messages between any two sites in a messaging network, both sites must have a common networking solution implemented and agree to use it.

Example

The following diagram shows three sites that are part of a larger messaging network.

- Site 1 has Enterprise Networking, Integrated AMIS Networking, and VPIM Networking implemented.
- Site 2 has Enterprise Networking and VPIM Networking implemented.
- Site 3 has Enterprise Networking implemented.



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Sites 1 and 2 can exchange messages using either Enterprise Networking or VPIM Networking. The two sites must agree on which protocol to use. When a user at one site sends a message to a user at the other site, only the selected protocol is used.

Sites 2 and 3 can exchange messages using only Enterprise Networking.

Connections

Introduction

A CallPilot system can connect to different systems, depending on the protocols installed.

Connections supported

CallPilot can be connected to the following systems using the following networking solutions.

System	Networking solution
CallPilot	■ Enterprise Networking ■ VPIM Networking ■ Integrated AMIS Networking ■ AMIS Networking
Norstar Voice Mail (Release 3 and higher)	■ VPIM Networking ■ Integrated AMIS Networking ■ AMIS Networking
Meridian Mail (Release 11 and higher)	■ Enterprise Networking ■ Integrated AMIS Networking ■ AMIS Networking
Meridian Mail (Release 11 and higher) with Meridian Mail Net Gateway (Release 1 and higher)	■ VPIM Networking
Meridian Mail (Release 8, 9, 10)	■ Integrated AMIS Networking ■ AMIS Networking
Third-party system (must be compliant)	■ VPIM Networking ■ AMIS Networking

Analog protocol connections

With Enterprise Networking, CallPilot connects to

- another CallPilot system (Release 1 or later)
- a Meridian Mail system (Release 11 or later)

With AMIS Networking and Integrated AMIS Networking, CallPilot connects to

- another CallPilot system (Release 1 or later)
- a Norstar Voice Mail system (Release 3 or later)
- a Meridian Mail system (Release 8 or later)
- any third-party messaging system that supports the AMIS protocol

Digital protocol connections

Using VPIM Networking, CallPilot connects to

- another CallPilot system (Release 1 or later)
- a Norstar Voice Mail system (Release 3 or later)
- a Meridian Mail system (Release 11 or later), through a Meridian Mail Net Gateway (Release 1 or later) that serves as a gateway from the analog to the digital
- a third-party messaging system that supports digital transmission

Third-party systems

If you are connecting a CallPilot system to a third-party system, check the documentation for that system to ensure that the system is compliant.

You may need to adjust the configuration of a third-party system. Consult the documentation for that system.

Networking solution keycodes

Introduction

The five networking solutions are available as optional additions to CallPilot software.

Keycodes make the networking solutions available.

Keycodes

The following keycodes are used to enable networking solutions:

Keycode	Action
Networking	Enables the following networking solutions: ■ AMIS Networking ■ Integrated AMIS Networking ■ Enterprise Networking ■ VPIM Networking Enables a maximum of 500 integrated sites. **Note:** Enables remote NMS sites to be added to the network database. Does not allow the local site to be added as an NMS site.
NMS	Enables use of NMS on the local site. **Note:** Enables a maximum of 60 switch locations, including prime switch location.

Installation

When you purchase the networking keycode, all networking solutions, except for NMS, are available on your site.

However, during the installation of CallPilot, you can select which networking solutions you want to install. Install only the networking solutions that you plan to use to simplify the implementation process.

If you install networking solutions that you do not plan to use, you are asked to provide information that you may not have available. The implementation process becomes more complicated if you install unnecessary networking solutions.

ATTENTION!

Once installed, a networking solution cannot be uninstalled. Therefore, install only the networking solution or solutions that you require. You can add additional networking solutions at any time.

Documentation

Introduction

Each networking solution has an implementation and administration guide. Each guide provides overview information that explains how the networking solution works. The guides also provide detailed step-by-step information about the implementation process.

These guides supplement the information in the online Help. All guides are available online; they may be printed in whole or in part. Printed and bound versions of the guides may be ordered separately.

Guides

These guides are available in online format.

IF the site has	THEN use this guide
Network Message Service (NMS)	*NMS Implementation and Administration Guide* (NTP 555-7101-302)
AMIS Networking	*AMIS Networking Implementation and Administration Guide* (NTP 555-7101-303) **Note:** If the local site uses the AMIS protocol to exchange messages with open sites only, use this guide.
Integrated AMIS Networking	*Integrated AMIS Networking Implementation and Administration Guide* (NTP 555-7101-305) **Note:** If the local site uses the AMIS protocol to exchange messages with both open and integrated sites, use this guide only.

IF the site has	THEN use this guide
Enterprise Networking	*Enterprise Networking Implementation and Administration Guide* (NTP 555-7101-304)
VPIM Networking	*VPIM Networking Implementation and Administration Guide* (NTP 555-7101-306)

Networking Planning Guide

Every site in the messaging network should have a copy of the *Networking Planning Guide* (NTP 555-7101-100).

Other documentation

To implement a networking solution, you need the relevant messaging server and switch documentation.

Messaging networks and users

In this section

Overview

Introduction

The networking solutions offered by CallPilot are designed to make it easier for users to exchange messages.

Terminology note

Although users have mailboxes on the Meridian Application Server, their telephones are attached to the switch. Their desktops are on the local area network (LAN).

For convenience, users are said to be “on a switch.”

Ease of use

When you implement a networking solution, you provide information that the system uses to make it easy for local users to use networking. While the implementation process can seem complicated, the end result is a system that is easier to use.

Whenever possible, CallPilot networking is designed so that users can address a message to a remote site in the same way they dial that remote site. That is, there are no additional numbers to memorize.

Implementing NMS involves entering information that makes the NMS setup transparent to users. Users do not realize if they are on the prime switch or on a satellite switch.

Message types supported

Introduction

CallPilot networking supports the exchange of different types of messages and message attachments.

Comparison

The following table shows the message types supported by each networking solution.

Networking solution	Voice	Fax	Text
AMIS Networking	Yes	No	No
Integrated AMIS Networking	Yes	No	No
Enterprise Networking	Yes	No	No
VPIM Networking	Yes	Yes	Yes
NMS	Yes	Yes*	Yes*

* NMS supports fax and text messages if fax is supported on CallPilot and user mailboxes have fax capabilities.

Fax format

A fax message is encoded according to the tag-based image file format-Class F (TIFF-F) specification.

A fax must be in TIFF-F. When saving faxes, be aware of subtypes (there are many besides Class F). Not all subtypes are supported. All TIFF files, regardless of subtype, have a TIF extension.

CallPilot supports only the following subtypes:

- Data must be in little-endian byte order. The big-endian order is not supported.
- Only fax blocks are supported. FASCII blocks are not supported.

- For TIFF to fax transcoding:
  - All image widths and lengths are supported.
  - Images must have an X-resolution of 204 pixels/inch.
  - Images must have a Y-resolution of 98 or 196 pixels/inch.
  - Only a compression value of 3 is supported.
- For fax to TIFF transcoding:
  - Only images with a width of 1728 pixels/inch are supported.
  - Images must have an X-resolution of 204 pixels/inch.
  - Images must have a Y-resolution of 98 or 196 pixels/inch.

Message type and non-delivery notifications

When users send a message type that is not supported, they receive non-delivery notifications.

Message lengths

Introduction

Each networking solution supports different system message lengths.

A message consists of the message header, the message body, and all attachments. A message can contain a mixture of message types, since each message can be one of different media types: voice, fax, or text.

Note: The Class of Service granted to a mailbox determines the message length limits that can be sent and received by a user. The length can be shorter than the system maximum.

Comparison

The following table compares the message lengths supported by each networking solution.

Networking solution	Approximate byte limit	Approximate maximum voice length time limit	Notes
AMIS Networking	1.2 Mbytes	8 minutes	■ Voice supported only
Integrated AMIS Networking	1.2 Mbytes	8 minutes	■ Voice supported only
Enterprise Networking	17.3 Mbytes	120 minutes	■ Limit of each part is 99 minutes ■ Voice supported only

Networking solution	Approximate byte limit	Approximate maximum voice length time limit	Notes
VPIM Networking	17.3 Mbytes	120 minutes	■ Voice, fax, and text supported ■ Affected by voice encoding format used and other factors
NMS	17.3 Mbytes	120 minutes	■ Same as limit for local messages

Message length and non-delivery notifications

All messages are sent in their entirety. A message that exceeds the length limit is not broken into smaller units and sent as a series of messages.

If a message exceeds the length limit or is rejected by the receiving system due to length, the message is not delivered and a non-delivery notification is sent to the sender.

Length checking

The length of a message is not checked before it is sent, because a message may be addressed to multiple recipients using different networking solutions that allow for different maximum message length.

This means that a sender does not know that the limit is exceeded until a non-delivery notification is received.

Enterprise Networking

A non-delivery notification is sent if an Enterprise Networking message

- exceeds the total limit of 120 minutes, or
- any part of the message exceeds the 99-minute limit

Approximate equivalents

A message can contain a mixture of media. This means that only an approximate equivalent can be determined from the total bytes of storage needed for a message.

To determine the approximate length of voice, fax, and test messages, the following conversion guideline factors are used:

Voice

144 kbytes = approximately one minute

Fax

41 kbytes = one fax page (normal resolution, standard page size)

Text

- 1 byte = one byte

Telephone users and desktop users

Introduction

CallPilot networking solutions support computer telephony.

Computer telephony brings together two communications systems—the telephone system and the computer system. Merging these systems offers a richer information channel and a way to improve the capabilities of two communication systems. However, computer telephony has special requirements in terms of implementing CallPilot networking.

All CallPilot users have telephone access and use the telephone interface. In addition, some or all users may have desktop access. These users may use the desktop interface.

When you implement a networking solution, much of the configuration is designed to make networking as transparent as possible for users. That is, you configure the system so that users address a message to another site in almost the same way they dial to that site.

Telephone users

Telephone users can use networking features as allowed by the system administrator.

Desktop users

The desktop is another way for users to access messages. It offers the same capabilities as the telephone, but can also be used to view fax and text messages.

Desktop users can use networking features as allowed by the system administrator.

If your site has desktop users, there is an impact only on the implementation of VPIM Networking. For all other networking solutions, the implementation is the same whether the local site supports telephone users, desktop users, or both.

Terminology note

Throughout the networking documentation, a distinction is made between telephone users and desktop users where necessary.

However, if there is no difference between the actions of the two types of users or no differences between the functionality they can expect, the term *user* applies to both groups.

It is important to remember the distinction between the two types of users while implementing a networking solution. Some information that you must provide during implementing applies specifically to telephone users or desktop users.

Teaching users how to use networking

Introduction

After you have implemented CallPilot networking, you must let local users know how to use it.

Addressing integrated sites

During implementation, you specify various access codes and other information for each remote site that can exchange messages with the local site.

Some of this information must be made available to your local users. It supplements the information in their user's guides.

Example

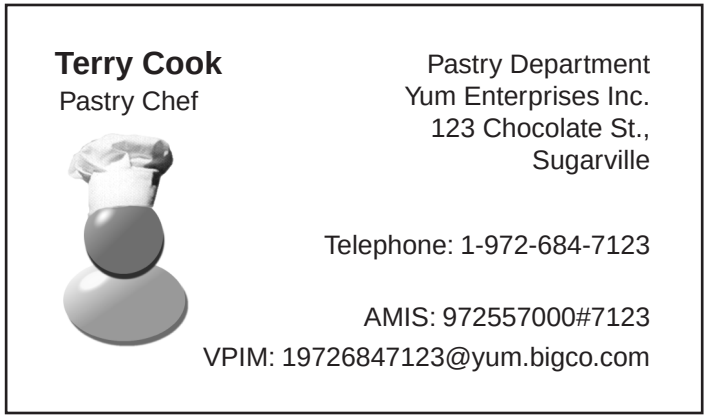
You configure the system with a VPIM Networking access code, 15. This access code must be entered before a VPIM shortcut to an open site or an integrated site is entered. You must announce what the code is and when to use it.

Addressing open sites

To exchange messages with open sites, users must know that an open site uses a compliant protocol and must know how to address users at that open site.

Example

The following business card provides an AMIS address and a VPIM address, as well as a telephone number.



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Open AMIS Networking

To exchange messages with a remote open site using the AMIS protocol, users must know the system access number of that remote site.

Open VPIM Networking

To exchange messages with a remote open site using the VPIM protocol, users must know the VPIM address of that remote site.

A VPIM address resembles a standard e-mail address.

- e-mail address: username@institution.com
- VPIM address: 14165975555@institution.com

The composition of a VPIM address creates some problems. Because the address contains alphabetic, as well as numeric, characters, only desktop users can enter an Open VPIM address. If local telephone users want to exchange messages with open sites using VPIM networking, you must create an Open VPIM shortcut for them.

An Open VPIM shortcut translates an alphanumeric VPIM address into a numeric address. This enables telephone users to enter VPIM addresses.

See also

For a detailed discussion on addressing VPIM Networking messages and how VPIM shortcuts work, consult the *VPIM Networking Implementation and Administration Guide*.

Non-delivery notifications

Introduction

If users attempt to use CallPilot in ways that are not supported, they receive non-delivery notifications. A non-delivery notification provides a brief description of why a message could not be delivered. Usually, a non-delivery notification contains enough information for a user to identify and correct a problem without assistance from the network administrator.

Non-delivery notifications and the Event Monitor

Most networking activities that generate non-delivery notifications also trigger an event listed in the Event Monitor. In this way, the network administrator can monitor how users are attempting to use the messaging network.

Too many events indicates that users need additional training on how to use networking features.

Exception

One activity generates a non-delivery notification for a user but does not trigger an event.

If a user sends a message to a nonexistent mailbox on a remote site, a non-delivery notification is generated. An event is not triggered even if several attempts are made to reach this nonexistent mailbox.

Users can contact their local network administrator to help resolve the problem.

See also

For detailed information about the Event Monitor, consult the *Maintenance and Diagnostics Guide*.

Features

In this section

Overview

Introduction

Each Meridian CallPilot networking solution supports different features.

Feature comparisons

The following table lists the CallPilot features that are supported by each of the networking solutions.

Detailed discussions of these features are available in the sections that follow.

Note: In the following table, Yes may be qualified. Check the detailed discussions for more information.

Feature	AMIS	Integrated AMIS	Enterprise	VPIM	NMS
Call Sender	No	Yes	Yes	Yes	Yes
Names Across the Network	No	No	Yes	No	n/a
Name Addressing	No	Yes	Yes	Yes	Yes
Personal Distribution Lists	Yes	Yes	Yes	Yes	Yes
Shared Distribution Lists	No	Yes	Yes	Yes	Yes
Multiple Recipients	No	No	Yes	Yes	Yes
Reply To	Yes	Yes	Yes	Yes	Yes
Reply All	No	No	Yes	Yes	Yes
User-Recorded Personal Verification	No	No	Yes	No	Yes
Administrator-Recorded Personal Verification	No	Yes	Yes	Yes	Yes

Feature	AMIS	Integrated AMIS	Enterprise	VPIM	NMS
Remote Site Spoken Names	No	Yes	Yes	Yes	Yes
Privacy Tag	No	No	Yes	Yes	Yes
Acknowledgment Tag	Yes	Yes	Yes	Yes	Yes
Urgent Tag	Yes	Yes	Yes	Yes	Yes
Received Time Announced	Yes	Yes	Yes	Yes	Yes
Sent Time Announced	No	No	Yes	Yes	Yes
120-Minute Messages	No	No	Yes	Yes	Yes
Sender’s Name (Text)	No	No	Yes	Yes	Yes
Recipient’s Name (Text)	No	No	Yes	Yes	Yes
Message Subject (Text)	No	No	Yes	Yes	Yes
Timed Delivery	No	No	Yes	No	No

See also

For general discussions about any of the features listed here, consult the *Basic Administration Guide*.

For more detailed discussions, consult the appropriate chapters in the relevant *Advanced Administration Guide*.

Enhancements to Meridian Mail 11 capabilities

Introduction

If you are familiar with Meridian Mail, you will notice that CallPilot expands and enhances the networking capabilities offered by Meridian Mail.

Enhancement highlights

CallPilot offers networking enhancements in the following areas:

- site capacity
- steering code capacity
- VPIM Networking

Site capacity

A CallPilot messaging network can contain 500 integrated sites. A Meridian Mail 11 messaging network can contain 150 integrated sites.

Steering code capacity

CallPilot increases the number of CDP steering codes supported from 50 to 500.

VPIM Networking

VPIM Networking is a new networking solution. Meridian Mail does not include a digital networking solution. Meridian Mail sites that want to use digital networking have to attach Meridian Mail Net Gateway to their existing Meridian Mail system.

Note: The Bulk Provisioning feature in Meridian Mail is called AutoAdd in CallPilot.

See also

For a general overview of CallPilot's enhancements to Meridian Mail capabilities, consult the *CallPilot Overview Guide*.

For more detailed information, consult the *Meridian Mail to CallPilot Migration Guide*.

Migration from Meridian Mail

Introduction

If your implementation of a CallPilot networking solution is an upgrade of an existing Meridian Mail networking solution, you can use the Migration utility to capture most of the legacy information.

The migration utility saves you time and ensures that information is upgraded accurately and completely.

Information that is migrated

Since CallPilot provides many enhancements to Meridian Mail 11, the migration is not a straightforward transfer of information.

Some information must be modified after migration. Additional information must be provided.

See also

For detailed information on migrating networking information, consult the *Meridian Mail to CallPilot Migration Guide*.

Networking and other features

In this section

Overview

Introduction

CallPilot networking solutions have special interactions with the following features:

- shared distribution lists
- personal distribution lists
- Names Across the Network
- message trigger mailbox

Shared distribution lists

Introduction

Shared distribution lists can be used in a messaging network.

Definition

A shared distribution list (SDL) is a list of recipients that is created by a system administrator.

Interaction with networking

A shared distribution list can include both local and remote users. To be included in a shared distribution list, a remote user must be defined on the local site.

If a message is sent to a shared distribution list, all local and remote users on the list receive the message.

A user at one site can send a message to a shared distribution list that is defined on another site.

Examples

The following example describes how SDLs are used.

Using SDLs with Enterprise Networking

Sam Hicks in New York wants to send a message to everyone on a shared distribution list that includes local users and remote users in Boston.

- New York SDL = 2201

Sam composes a message and enters 2201. Users at both sites receive Sam's message.

See also

For more information on shared distribution lists, consult the appropriate sections in the *Advanced Administration Guide*.

Personal distribution lists

Introduction

Personal distribution lists can be used in a messaging network.

Definition

As its name implies, a personal distribution list (PDL) is created and maintained by a user, not an administrator.

A personal distribution list contains the addresses that are used frequently by a user. The list saves time, because a user does not have to enter each recipient's address each time a message is sent.

Interaction with networking

Network addresses can be included in a personal distribution list. A list can include remote users, Open AMIS users, Open VPIM users, and NMS users.

Network addresses are validated. If a network address from a personal distribution list is found to be invalid after a message addressed with a personal distribution list is sent, the user receives a non-delivery notification.

Possible causes of invalid network addresses include the following:

- Changes have been made to the network configuration. Personal distribution lists are not automatically updated when changes are made.
- The user's permissions, such as the ability to use AMIS Networking, have been revoked.

Names Across the Network

Introduction

The Names Across the Network feature is available with Enterprise Networking only.

Definition

The Names Across the Network feature allows the spoken names of senders of messages to be reproduced at recipient sites. If a sender does not exist at the recipient site as a remote user, a temporary remote user is added to the site with the sender's text name and spoken name.

Names Across the Network eliminates the need for a system administrator to manually add a permanent remote user and record a spoken name on the user's behalf.

Enterprise Networking and Names Across the Network

System administrators can configure Enterprise Networking to handle Names Across the Network according to their needs. System administrators can

- Define whether the local site accepts and stores spoken names received using Names Across the Network.
- Define whether the local site sends spoken names with Enterprise Networking messages to a particular remote site.
- Define which remote sites the local site sends spoken names to.

The ability to configure these definitions is useful if the local site is placing calls to remote sites that incur long-distance toll charges. The administrator can choose to send spoken names to toll-free sites, but not to sites that incur toll charges.

See also

For a general description of remote users and how Names Across the Network works, see the section Remote users on page 141.

For more information, consult the appropriate section in the *Enterprise Networking Implementation and Administration Guide*.

System trigger mailboxes

Definition

A system trigger mailbox is a mailbox that is defined by the system administrator for a specific purpose.

Three types of system mailboxes are used by networking:

- alarm mailbox
- loopback mailbox
- broadcast mailbox

Alarm mailbox

The alarm mailbox receives messages generated by errors. You specify the type of error messages that are placed in the alarm mailbox.

Loopback mailbox

The loopback mailbox is used to test the messaging network. This mailbox automatically returns to the sender any message it receives.

Broadcast mailbox

The broadcast mailbox is used to send a message to all local users.

System mailboxes and NMS

In an NMS network, system mailboxes exist on the prime switch, not on a satellite switch.

See also

For more information about system mailboxes, consult the relevant sections of the *Advanced Administration Guide* and the *Reporter Guide*.

Networking solution considerations

In this section

Overview

Introduction

There are some important considerations that you must keep in mind when implementing CallPilot networking solutions. Understanding these considerations before implementation will help you recognize what functionality to expect from each networking solution.

Types of considerations

There are two main types of considerations:

- general—apply to all networking solutions
- specific—apply to a particular networking solution

General messaging network considerations

Introduction

General considerations that apply to all messaging solutions must be considered when planning a network.

Number of sites

CallPilot supports a maximum of 500 integrated sites.

Channels supported

All networking solutions can use voice channels.

Networking solutions can also use fax and speech recognition channels if the resources are available.

Delivery sessions

The maximum number of simultaneous delivery sessions to a single remote site depends on the networking solution.

This networking solution	supports
AMIS Networking	up to five sessions.
Integrated AMIS Networking	up to five sessions.
Enterprise Networking	up to five sessions.
VPIM Networking	a maximum of one session outgoing. a maximum of one session incoming.

Other considerations

In addition to these general considerations, each networking solution has specific considerations that must be kept in mind. These are described in the following sections.

AMIS Networking features

AMIS Networking features

The following table lists the CallPilot features that are or are not supported by AMIS Networking.

CallPilot feature	Supported	Notes
Call Sender	No	
Names Across the Network	No	
Name Addressing	No	
Name Dialing	No	
Personal Distribution Lists	Yes	AMIS addresses can be included in a user's personal distribution list.
Shared Distribution Lists	No	
Multiple Recipients	Yes	When a message is sent to more than one recipient, a separate message is transmitted for each AMIS recipient.
Reply To	Yes	Restriction/Permission Lists can be set up to block return messages to certain sites, such as international long-distance sites.
Reply All	No	AMIS messages only contain information about the originator of a message, not all recipients of the message.
User's Actual Personal Verification	No	
Administrator-Recorded Personal Verification	No	

CallPilot feature	Supported	Notes
Remote Site Spoken Names	No	
Private Tag	No	AMIS does not support private message tags. For this reason, messages tagged as private are returned to the sender with a non-delivery notification.
Acknowledgment Tag	Yes	Acknowledgment tags indicate that the message was delivered to the remote site, not that it was listened to.
Urgent Tag	No	When users tag a message as urgent, the system treats it as urgent for the prioritizing of delivery. However, the recipient of an urgent message does not know it was tagged as urgent.
Economy Tag	Yes	When users tag a message as economy, the system treats it as economy for the prioritizing of delivery. However, the recipient of an economy message does not know it was tagged as economy.
Received Time Announced	Yes	The time when the message was deposited into the mailbox is announced to the recipient.
Sent Time Announced	No	
120-Minute Messages	No	Message body length is limited to eight minutes. Messages longer than eight minutes are not sent, and a non-delivery notification is sent to the originator.
Sender’s Name (Text)	No	
Recipient’s Name (Text)	No	
Message Subject (Text)	No	

CallPilot feature	Supported	Notes
Sender’s Department	No	
Timed Delivery	Yes	

Mailbox length

For AMIS Networking, mailboxes cannot exceed 16 digits.

Message handling

AMIS Networking delivers all messages in their entirety or not at all. Messages are never delivered in part. A non-delivery notification (NDN) indicates that no part of the message was received.

Other considerations

The considerations described in General messaging network considerations on page 113 also apply to AMIS Networking.

Integrated AMIS Networking features

Integrated AMIS Networking features

The following table lists the CallPilot features that are or are not supported by Integrated AMIS Networking.

CallPilot feature	Supported	Notes
Call Sender	Yes	Call Sender can be used for both call answering and composed messages from Integrated AMIS Networking users if ■ the mailbox numbering plan follows the dialing plan, or ■ a remote user is added for the network user
Names Across the Network	No	
Name Addressing	Yes	This feature is available if users at the remote site are defined as remote users at the local site.
Name Dialing	Yes	This features is available if users at the remote site are defined as remote users at the local site.
Personal Distribution Lists	Yes	Integrated AMIS Networking addresses can be included in a PDL.
Shared Distribution Lists	Yes	A remote user is required. A network address cannot be entered into the shared distribution list unless the address corresponds to a remote user.
Multiple Recipients	No	
Reply To	No	
Reply All	No	A message has only one recipient.

CallPilot feature	Supported	Notes
Users Actual Personal Verification	Yes	The user's actual personal verification is not carried across sites.
Administrator-Recorded Personal Verification	No	The administrator can record a personal verification for remote users who are defined at the local site.
Remote Site Spoken Names	Yes	A spoken name can be recorded for each remote switch location when configuring the remote site maintenance screen.
Private Tag	No	AMIS does not support private message tags. For this reason, messages tagged as private are returned to the sender with a non-delivery notification.
Acknowledgment Tag	Yes	Acknowledgment tags indicate that the message was delivered to the remote system, not that it was listened to.
Urgent Tag	Yes	Users can tag a message as urgent, and the system treats it as urgent for the prioritizing of delivery. However, the recipient of an urgent message does not know it was tagged as urgent.
Economy Tag	Yes	Users can tag a message as economy, and the system treats it as economy for the prioritizing of delivery. However, the recipient of an urgent message does not know it was tagged as economy.
Received Time Announced	Yes	The time when the message was deposited into the mailbox is announced to the recipient.
Sent Time Announced	No	

CallPilot feature	Supported	Notes
120-Minute Messages	No	Message body length is limited to eight minutes. Messages longer than eight minutes are not sent, and a non-delivery notification is sent to the originator.
Sender's Name (Text)	Yes	
Recipient's Name (Text)	Yes	If the recipients are defined as remote users, their names are provided.
Message Subject (Text)	No	
Sender's Department	No	
Timed Delivery	Yes	

Mailbox length

For Integrated AMIS Networking, mailboxes cannot exceed 16 digits.

Message handling

Integrated AMIS Networking delivers all messages in their entirety or not at all. Messages are never delivered in part. A non-delivery notification (NDN) indicates that no part of the message was received.

Other considerations

The considerations described in General messaging network considerations on page 113 also apply to Integrated AMIS Networking.

Enterprise Networking features

Enterprise Networking features

The following table lists the CallPilot features that are or are not supported by Enterprise Networking.

CallPilot feature	Supported	Notes
Call Sender	Yes	Can be used for both call answering and composed messages from network users if ■ the calling line identification (CLID) is present in the message, or ■ the mailbox numbering plan follows the dialing plan, or ■ a remote user entry is added for the network user
Names Across the Network	Yes	
Name Addressing	Yes	Name addressing is available if users at the remote site are defined as remote users at the local site. This can be done automatically with Names Across the Network or manually by the administrator.
Personal Distribution Lists	Yes	This feature is available if users at the remote site are defined as remote users at the local site, which can be done by Names Across the Network.
Shared Distribution Lists	Yes	A remote user is required. A network address cannot be entered into the shared distribution list unless the address corresponds to a remote user.

CallPilot feature	Supported	Notes
Multiple Recipients	Yes	The Enterprise Networking message contains all the recipients of the message who are at integrated sites. Recipients at open sites are not included.
Reply To	Yes	This feature can be used with all network messages. It can also be used with call answering messages left by network users if the calling line identification (CLID) is present on the message and all other conditions listed for Call Sender are met.
Reply All	Yes	This feature works with all recipients at integrated sites. It does not include recipients at open sites.
User's Actual Personal Verification	Yes	The user's personal verification is played to callers in voice messaging scenarios if recipients are defined as remote users at the local site. AutoAdd or Names Across the Network can be used to create the user's personal verification.
Administrator- Recorded Personal Verification	Yes	The administrator can record a personal verification for remote users who are defined at the local site.
Remote Site Spoken Names	Yes	A spoken name can be recorded for each remote site when configuring a remote site.
Private Tag	Yes	Messages tagged as private are announced to the recipient and may not be forwarded by the recipient to anyone else.
Acknowledgment Tag	Yes	Acknowledgment tags result in a message to the sender indicating that the message was actually listened to.

CallPilot feature	Supported	Notes
Urgent Tag	Yes	Messages tagged as urgent trigger urgent-related features, such as Remote Notification or Message Waiting Indication. Urgent messages are treated with priority for transmission as determined by the scheduling parameters.
Economy Tag	Yes	
Received Time Announced	Yes	The time when the message was deposited into the mailbox is announced to the recipient. The time reflects the time zone of the recipient.
Sent Time Announced	Yes	The sent time announced to the recipient reflects the time zone of the sender, not the recipient.
120-Minute Messages	Yes	Enterprise Networking supports messages containing up to 120 minutes of voice, including any attachments.
Sender’s Name (Text)	Yes	Only supported if American English character set (ASCII 32–126) used.
Recipient’s Name (Text)	Yes	If the recipients are defined as remote users, their names are provided. Only supported if American English character set (ASCII 32–126) used.
Message Subject (Text)	Yes	Only supported if American English character set (ASCII 32–126) used.
Sender’s Department	No	
Timed Delivery	Yes	Any message can be tagged for future delivery.

Message body length

The maximum length of an Enterprise Networking message, including the voice recording and all attachments, is 120 minutes.

The length of an Enterprise Networking message is not restricted by the number of recipients.

Message handling

Enterprise Networking delivers all messages in their entirety or not at all. Messages are never delivered in part. A non-delivery notification (NDN) indicates that no part of the message was received.

Other considerations

The considerations described in General messaging network considerations on page 113 also apply to Enterprise Networking.

VPIM Networking features

VPIM Networking features

The following table lists the CallPilot features that are or are not supported by VPIM Networking.

CallPilot feature	Supported	Notes
Call Sender	Yes	Supported for messages to integrated sites only. Can be used for both call answering and composed messages from network users if ■ the calling line identification (CLID) is present in the message, or ■ mailbox addressing follows dialing plan for the remote site, or ■ a remote user entry is added for the network user
Names Across the Network	No	This feature is currently not supported.
Name Addressing	Yes	A remote user must be defined.
Personal Distribution Lists	Yes	A remote user must be defined.
Shared Distribution Lists	Yes	A remote user must be defined.
Multiple Recipients	Yes	Recipients to non-VPIM sites are not included in the VPIM message.
Reply To	Yes	
Reply All	Yes	Replies are sent to the VPIM recipients of the message only.
User’s Actual Personal Verification	No	

CallPilot feature	Supported	Notes
Administrator-Recorded Personal Verification	Yes	A remote user must be defined.
Remote Site Spoken Names	Yes	To integrated VPIM sites only.
Private Tag	Yes	Messages tagged as private are announced as such to the recipient. Private messages may be forwarded.
Acknowledgment Tag	Yes	Acknowledgment tags result in a message to the sender indicating that the message was actually listened to.
Urgent Tag	Yes	Messages tagged as urgent trigger urgent-related features, such as Remote Notification or Message Waiting Indication. Messages tagged as urgent are announced as such to the recipient.
Economy Tag	Yes	
Received Time Announced	Yes	
Sent Time Announced	Yes	Sent time is converted to the recipient's local time zone and is expressed in local time.
120-Minute Messages	Yes	Length is restricted only by memory available on the mail server and other factors.
Sender's Name (Text)	Yes	Only supported if American English character set (ASCII 32–126) used.
Recipient's Name (Text)	Yes	Only supported if American English character set (ASCII 32–126) used.
Message Subject (Text)	Yes	Only supported if American English character set (ASCII 32–126) used.

CallPilot feature	Supported	Notes
Sender's Department	No	
Timed Delivery	Yes	

Planning and engineering considerations

The following issues must be considered for VPIM Networking implementation:

- impact of VPIM on the local area network (LAN)
- message handling capabilities (throughput)
- message queuing capacities
- message delivery times

LAN load

The sustained maximum load by VPIM Networking on its connected LAN is predicted to be 180 kbytes per second (less than 1 percent of 10BaseT bandwidth), and is equal to the estimated pump rate for the SMTP delivery process.

This is independent of the aggregate number of SMTP connections on allocated IP ports (specified as five inbound and five outbound).

The average data rate imposed on the LAN by VPIM, in order to keep four Enterprise Networking channels active, is 21 kbytes per second (less than 1 percent of 10BaseT bandwidth).

For example, a 94-minute message creates a 33 Mbyte file that would take three minutes to go from one Net Gateway system to another.

Message handling

VPIM Networking delivers all messages in their entirety or not at all. Messages are never delivered in part. A non-delivery notification (NDN) indicates that no part of the message was received.

Other considerations

The considerations described in General messaging network considerations on page 113 also apply to VPIM Networking.

Network Message Service features

NMS features

The following table lists the CallPilot features that are or are not supported by NMS.

CallPilot feature	Supported
Call Sender	Yes
Names Across the Network	n/a
Name Addressing	Yes
Name Dialing	Yes
Personal Distribution Lists	Yes
System Distribution Lists	Yes
Multiple Recipients	Yes
Reply To	Yes
Reply All	Yes
User’s Actual Personal Verification	Yes
Administrator-Recorded Personal Verification	Yes
Remote Site Spoken Names	Yes
Private Tag	Yes
Acknowledgment Tag	Yes
Urgent Tag	Yes
Received Time Announced	Yes
Sent Time announced	Yes

CallPilot feature	Supported
120-Minute Messages	Yes
Sender's Name	Yes
Recipient's Name (Text)	Yes
Message Subject (Text)	Yes
Sender's Department	Yes
Deferred Delivery	Yes

Recipient's Name (Text)

This feature is available for use if it is implemented on the local system. This feature is not available if the recipient is a user at a remote sites and is not defined as a remote user.

Signaling

NMS has the following signaling considerations:

ISDN signaling

NMS uses the signaling capabilities of the ISDN primary rate access (ISDN PRA) and ISDN signaling link (ISL) to provide messaging servers. Therefore, NMS is subject to the assumptions and considerations of the ISDN Network Numbering Plan Enhancement feature.

If a non-PRA or -ISL trunk is involved in an NMS call, NMS is not supported, because the original called number and calling party number are not sent.

Virtual signaling

Virtual signaling is used between the prime switch and the satellite switches to

- Turn the Message Waiting Indicator (MWI) on and off at a user's telephone.
- Transport necessary call information for a networked voice messaging feature, such as Call Sender.

These capabilities are supported by using ISDN non-call associated transaction messages.

End-to-end signaling

End-to-end in-band signaling (EES) is required to access CallPilot features from a satellite switch.

ISDN Network Call Redirection

NMS is based on the Network Call Redirection (NCRD) features of the switch. Therefore, NMS is subject to the assumptions and considerations of the NCRD features.

Dialing plans

NMS supports the following dialing plans:

- Electronic Switched Network (ESN)
- Coordinated Dialing Plan (CDP)
- hybrid dialing plan, which combines ESN and CDP

NMS does not support another dialing plan, such as public switched telephone network (PSTN).

NMS dialing restriction scenarios

Introduction

A uniform dialing plan is required for an NMS network. This requirement has important implications for implementing an NMS network and may require the reconfiguration of an existing dialing plan.

The uniform dialing plan requirement applies in the following scenarios:

- calls to other users in the NMS environment
- calls to other users in the private messaging network but not part of the local NMS network
- calls to public switched telephone network (PSTN) users beyond the private messaging network

Dialing restrictions for calls within an NMS network

Dialing among all users on all switches in an NMS network must be done uniformly, but the ESN access code may be different.

Dialing restrictions for calls within a private messaging network

A uniform dialing plan is also necessary when an NMS network is a site in a larger private messaging network and the local users dial remote switch locations in the messaging network.

Dialing from all users on all switches in an NMS network to a remote site in the private network must be done uniformly, but the ESN code may be different.

Dialing restrictions for calls beyond the private messaging network

A uniform dialing plan is also necessary when local NMS network users call PSTN destinations.

The PSTN access code must be the same on all NMS locations.

Implications

Dialing plan restrictions for calls beyond the private messaging network have important implications for implementing an NMS network.

For all switches in an NMS network to dial PSTN destinations in the same way, the following must occur:

- All switches in the NMS network must be located in the same area code.
- All switches must be located close to one another.
- All switches must use the same prefixes to reach the PSTN.

If these requirements are not met, when a user in the NMS network dials a PSTN destination using features such as Thru-Dial, Call Sender, and Remote Notification, the system operation may not be as expected.

All switches must be located in the same country and area/city code

For example, switch A is in the 416 area/city code, and switch B is in the 905 area code. To dial from switch A to (416)597-1234, a user dials 95971234. However, a user on switch B must dial 614165971234. NMS is not supported in this environment.

All switches must be close to one another

For example, to reach the PSTN number (905)555-1234, a user on switch C may dial 619055551234. A user on switch D, however, may only dial 95551234. Because the switches have different local and long-distance dialing areas, and use different dialing formats to reach the same PSTN number, the dialing plan is not uniform. NMS is not supported in this environment.

All switches must use the same prefixes to reach the PSTN

For example, all switches in the NMS network must use the same local, long-distance, and international dialing prefixes. If users at switch E dial 61 for long distance and users at switch F dial 71, the dialing plan is not uniform and NMS is not supported.

Transmission times and traffic calculations

In this section

Overview

Introduction

Transmission time is the length of time it takes to transmit a message. Transmission times are an important consideration in networking, especially if long-distance toll charges are incurred when messages are sent to remote sites.

Factors affecting transmission times

Transmission times depend on several factors, including the following:

- the protocol used
- the number of recipients
- whether recipients are at the same site or different sites
- length of the message body
- whether the message contains remote user information for the Names Across the Network feature

Digital networking

The transmission times of digital messages depend on the amount of traffic on the network and the network connection bandwidth.

Transmission time concerns

There are two types of transmission time concerns:

- general issues that affect all CallPilot networking solutions
- issues that are specific to the nature of the message being sent

Message transmission times for analog protocols

Introduction

The amount of time that a voice channel is used to transmit a networking message depends on the networking solution being used.

Assumptions

The following discussion of message transmission times in a messaging network is based on the following assumptions:

- A network consists of three sites.
- 5 percent of recipients of composed messages are remote.
- The average message contains 40 seconds of voice.
- Communication patterns among sites are symmetrical.

AMIS Networking messages

AMIS Networking messages are transmitted separately for each recipient.

Example: A message to ten recipients is transmitted ten times.

NMS messages

Within an NMS network, messages are not transmitted. All users on the switches that make up the NMS network are added as mailbox users on the CallPilot server. The CallPilot server functions as the message center for the NMS network.

When a message is sent to one or more users within an NMS network, the message is deposited into each recipient's mailbox.

Transmission time comparisons

The following tables compare the transmission times when

- All recipients are at the same site.
- There is one recipient at each site in the network.

All recipients at the same site

Number of recipients at receiving site	AMIS Networking	Enterprise Networking
1 recipient	54.4 seconds	76 seconds
10 recipients	544 seconds	111 seconds
50 recipients	2720 seconds	262 seconds

One recipient at each site

Number of sites	AMIS Networking	Enterprise Networking
1 site	54.4 seconds	76 seconds
10 sites	544 seconds	760 seconds
66 sites	2176 seconds	3040 seconds

See also

For more detailed information on traffic calculations, consult the *Planning and Engineering Guide*.

Transmission times for messages containing text information

Introduction

VPIM Networking and Enterprise Networking can transmit the following information with a message:

- sender name
- all recipient names
- message subject

CallPilot displays this information on the recipient's desktop.

VPIM Networking

Transmitting this information over a digital network with VPIM Networking has no real impact on transmission times.

Control of text information transmission

With Enterprise Networking, text information may take a long time to deliver.

You can define the sites to which text information can be sent. This is useful when the local site is exchanging messages with sites that incur long-distance toll charges. You can choose to send text to toll-free sites, but not to sites that incur long-distance toll charges.

Text information transmission times

The sender's and the recipient's names can be included as text in a message. Each name can consist of up to 19 characters. Each character requires two DTMF tones. Based on five DTMF tones per second, it may take as long as 7.8 seconds to transmit a single name.

Transmission times comparison

The following table compares the transmission times of a standard message and a message that includes text.

Number of recipients at receiving site	Standard message (in seconds)	Enterprise Networking message with text	VPIM Networking message with text
1	76	89.6 seconds	Not applicable
10	111	132.8 seconds	Not applicable
50	262	324.8 seconds	Not applicable

Transmission times for messages with Names Across the Network

Introduction

The Names Across the Network feature is available with Enterprise Networking. This feature provides the ability to have the spoken name of a message sender reproduced at the recipient site. The user at the remote site is added to the local network database and becomes a remote user.

The Names Across the Network feature adds the sender's spoken name to the message body.

When Names Across the Network information is sent

When an Enterprise Networking message is sent, the sending and receiving sites negotiate whether spoken names are to be sent.

If the system administrator of the receiving site has configured the site to receive Names Across the Network, the sending site includes the spoken name with the message.

If the system administrator of the receiving site has configured the site not to receive Names Across the Network, the sending site does not send the spoken name. This results in a shorter transmission time.

See also

For detailed information on Names Across the Network and remote users, consult the appropriate section in the *Enterprise Networking Implementation and Administration Guide*.

Traffic considerations for VPIM Networking messages

Traffic calculations

It is difficult to provide precise measurements for VPIM Networking traffic. Performance depends on the total LAN load at any given moment. However, some indication of capacity can be provided.

Assumptions

These measurements are based on the following assumptions:

- The maximum number of messages created each minute is 96 for the entire CallPilot system.
- Networking traffic does not exceed 10 percent of total data network traffic. Therefore, VPIM Networking is designed to handle approximately ten messages every minute.
- The average message length is 30 seconds.

Traffic calculations

The above assumptions lead to the following network data rate:

10 * 30 * 4 kbyte/60 s = 40 kbyte/s

The practical bandwidth of a typical LAN is approximately 1 Mbyte/s. This should be sufficient to support a network data rate of 40 kbyte/s.

The typical network dial-up link is 28.8 kbit/s (approximately 7 kbyte/s). This is not fast enough to support a 40 kbyte/s network data rate. At this speed of network dial-up, messages are queued.

Remote users

In this section

Overview

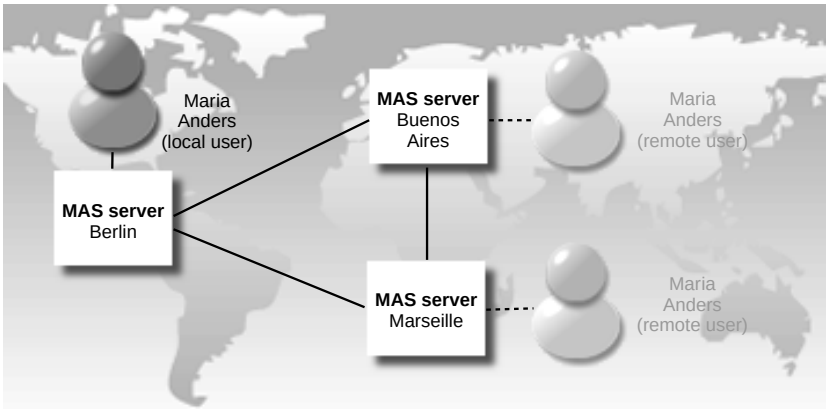
Definition: Remote user

A remote user is a messaging user whose mailbox resides on a remote networking site and who has been added to a local database of another networking site. A remote user is a guest on the local system.

It is important to distinguish between a remote user and a user at a remote site. A remote user is added to your database. A user at a remote site is not added to your database.

Example

Maria Anders has a mailbox on her local system in Berlin. She is added into the databases at the remote sites in Buenos Aires and Marseille as a remote user.



Benefits

There are many benefits to adding users from remote sites as remote users to the local site, including the following:

- When a user at the local site addresses a message to a remote voice user, the remote voice user’s personal verification (spoken name) is played.

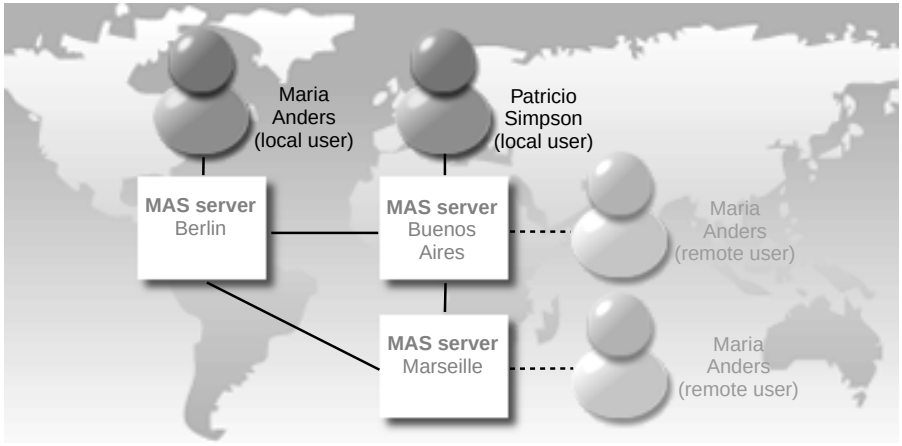
- Local users can use the Name Dialing and Name Addressing features to call and compose messages to remote voice users.
- While listening to a voice message left by a remote voice user, a local user can use Call Sender to call back the originator of the message immediately.
- External callers can name-dial remote voice users if this feature is enabled.
- Remote voice users can be added to system and personal distribution lists.

Example

Patricio Simpson is a local user at your office in Buenos Aires. Maria Andres is a user at the Berlin office. Maria has been added to the local site as a remote user.

Patricio can use name addressing when composing a voice message to Maria. During message addressing, he hears Maria's spoken name as a verification of the mailbox number he has entered.

When Patricio listens to a voice message from Maria, he presses 9, Call Sender, to call Maria back.



Status of remote users

Status

You can grant a remote user temporary status or permanent status.

The status that you grant to a remote user determines not only how the remote user works with the system. The status also determines, in part, how you administer the remote user.

Temporary remote user status

Temporary remote users are maintained by the system. When system resources for remote users become limited, CallPilot automatically deletes the temporary remote users who have been inactive for a long time. This ensures that system resources are available to active users.

Permanent remote user status

Permanent remote users remain on your local system until you decide to manually delete them. Permanent remote users require more administration than temporary remote users.

Changing a remote user’s status

The status of a remote user can be changed as required.

Temporary remote users

Introduction

Remote users are granted temporary or permanent status.

Definition: Temporary remote users

A temporary remote user is a remote user who can be removed from the network database automatically.

When a remote user is granted temporary status, the remote user's position in the network database is determined by that user's activity and the needs of the system.

If the system must delete some temporary remote users, it selects those users who have been inactive for the longest time.

Benefits of temporary remote users

The temporary status simplifies the administration of remote users. They can be added and deleted automatically by the system.

Ways to add temporary remote users

There are two ways to add temporary remote users. Each offers certain advantages and limitations.

- The Names Across the Network feature is available with Enterprise Networking. Remote users are automatically added to the local stem when they send messages to the local site if both the remote system and the local system are configured for Names Across the Network.
- User Administration allows you to add remote users one at a time. This method is useful for maintaining a system, but it is not practical when you are initially setting up your system and adding many remote users.

Temporary remote user capacity

The number of temporary remote users that can be added to the system is limited.

The system capacity cutoff is the maximum number of temporary remote users that the local system can contain.

The system capacity cutoff is 1000 remote users.

How temporary remote users are deleted

There are two ways to delete a temporary remote user from the local system:

- **User Administration.** You can remove remote users manually, one at a time, through User Administration.
- **Nightly audits.** Nightly audits are performed to ensure the temporary remote voice user database does not get too large. When the number of temporary remote users exceeds a set threshold, the oldest temporary remote users, indicated by their time stamps, are removed.

Time stamps

Every remote user has a time stamp, which is a record of the user's activity.

An initial time stamp is created when a remote user is originally added to your local database. The time stamp is updated automatically when

- the user is modified through User Administration
- an Enterprise Networking message is received from the remote user
- a remote voice user's personal verification, or mailbox number, is played

Time stamps and nightly audits

The nightly audit removes temporary remote users when the total number exceeds the system capacity of 1000 remote users.

During the nightly audit, the remote users with the oldest time stamps are deleted in groups of 10 until the number does not exceed the capacity cutoff limit.

When system capacity is exceeded

The system accepts more than 1000 remote users during the day. However, remote users must be removed from the system before the following day.

Example

Your system currently has 990 remote users. During the day, the system receives 40 additional remote users. These are accepted by the system and 1030 remote users are able to use the system during that day.

However, during the nightly audit, the system removes 30 remote users, based on their time stamp records.

Protect a temporary remote user from deletion

To ensure that a temporary remote user is never deleted from the database during the automatic nightly audits, change the user's status from temporary to permanent.

Permanent remote users

Introduction

Remote users are granted temporary or permanent status.

Definition: Permanent remote users

A permanent remote user is a remote user who remains on the local system until manually deleted.

Permanent remote users require more administration than temporary remote users. Permanent remote users must be manually maintained. The nightly audit, which automates much of the routine administration of temporary remote users, does not affect permanent remote users.

Method to add permanent remote users

Remote users are added one at a time through User Administration. This method is useful for maintaining a system, but it is not practical when you are initially setting up your system and adding many remote users.

How permanent remote users are deleted

Permanent remote users remain on the local system until they are deleted manually, one at a time, through User Administration.

Monitor permanent remote user activity

Because they take up system resources, permanent remote users should be active users.

If a permanent remote user is not active, change the user's status to temporary and let the system automatically maintain the user's status.

There are two ways to verify when a remote user was last active:

- Check the last Access Time box in the View/Modify Remote Voice User dialog box.
- Use the Find function, and list all permanent remote voice users. Remote users can be selected and modified from the List dialog box.

How remote users are added

Introduction

There are two ways to add remote users to your local database:

- Names Across the Network, which adds temporary remote users only.
- User Administration, which adds both temporary and permanent remote users.

When each method is used

It is likely that you will not use just one method to add and administer remote users. In most cases, you will use the method that is best suited to particular needs.

Names Across the Network

Names Across the Network is an ideal way to keep temporary remote users up-to-date in your database. Select this option when configuring your system to simplify the task of maintaining temporary remote users.

User Administration

User Administration is labor-intensive. User Administration is an entirely manual process that must be repeated for each individual user that you want to add or delete. It is the most appropriate method to use when you want to perform basic administration and maintenance on just a few users.

Adding remote users with Names Across the Network

Names Across the Network

Names Across the Network is a feature that automatically adds temporary remote users to a local database and maintains them.

You can use Names Across the Network if you have Enterprise Networking implemented on your system.

Incoming and outgoing messages treated separately

Names Across the Network is enabled for incoming and outgoing messages separately. A temporary remote user can be added when

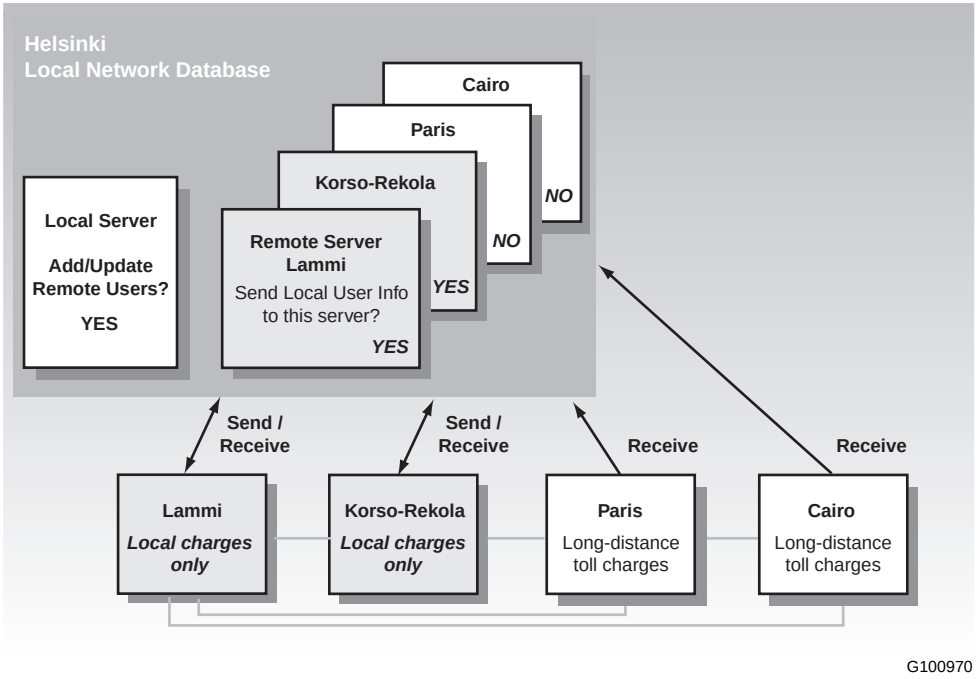
- a local user addresses a message to a user at a remote site
- a user at a remote site addresses a message to a local user

When you select Names Across the Network for incoming messages, you add temporary remote users from all sites in the messaging network.

However, because outgoing messages must carry additional information with them, resulting in longer transmission times, you can select Names Across the Network for outgoing messages for individual sites. For example, you might select the feature for outgoing messages to a site that will not incur long-distance toll charges, but clear the feature for a site that incurs these charges.

Example 1

The following example shows a messaging network consisting of five sites.

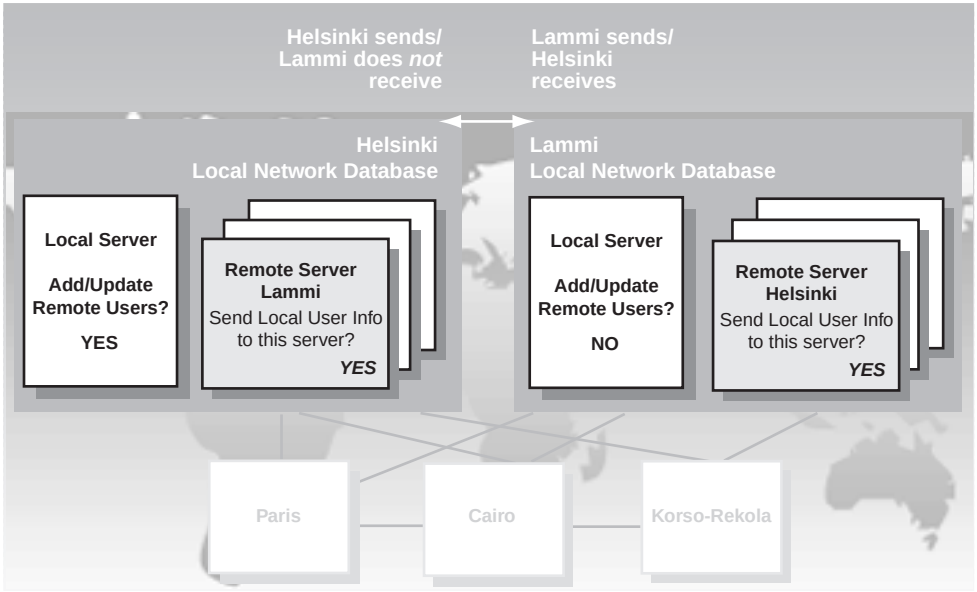


As the local administrator of the Helsinki site, you set your system to receives Names Across the Network. You receive messages from all other sites. However, when configuring information about the remote servers in your local database, you clear the Send Local User Information to this Server option for the sites that you do not want to send remote user information to. In this case, you do not want to incur the extra long-distance toll charges associated with Names Across the Network. Therefore, you clear the Send Local User Information to this Server option for Cairo and Paris.

However, Names Across the Network is also affected by the way the network administrator at a remote site configures the system.

Example 2

In the following example, the network administrator in Lammi decides to clear the Send Local User Information to this Server option when configuring the Helsinki remote server in the local messaging database. This means that even though you are willing to receive Names Across the Network information from Lammi, it is not sent to your site in Helsinki.



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In this case, when a user from Helsinki sends a message to a user in Lammi, the Helsinki user is not added to the Lammi database as a remote user.

To add remote users with Names Across the Network

The setting to add remote users with Names Across the Network is on the Messaging Network Configuration dialog box for your local messaging server.

This setting controls your local server. You must coordinate with the system administrator of each remote site with which you want to enable Names Across the Network.

You can use Names Across the Network only with remote sites that have Enterprise Networking installed.

When remote users are added and updated

Names Across the Network adds a temporary remote user to the local site when a user at a remote site sends a network message to a user at the local site. The remote user information is taken from the header of the message that is received.

Considerations

Names Across the Network has the following considerations:

- Users at remote sites are added to your system as temporary remote users only when messages are received from them. Users at remote sites who do not send network messages are not added, even if they are regularly name-dialed or have messages sent to them.
- Operational measurements are not collected for remote users.
- If the sender's site does not have mailbox numbers that match the dialing plan, the Call Sender and Name Dialing features are not available.
- During the nightly audit, temporary remote users cannot be added or updated.
- Only 18 characters of the remote voice user's text name are sent.

WHEN	THEN
the first and last names are 18 characters or less	the first and last names of the user are sent.
the initials and last name are 18 characters or less	the initials and last name of the user are sent.

WHEN	THEN
the last name only is 18 characters or less	only the last name is sent.
the last name is longer than 18 characters	only the last name, truncated to 18 characters, is sent.

Outgoing Enterprise Networking sessions

When the local site initiates an Enterprise Networking session to a remote site, the two sites negotiate whether spoken names are sent. This negotiation occurs as follows:

IF	THEN
the local site chooses to send spoken names AND the remote site has selected the Add/Update Remote Users on this Server option	the local site includes the sender's text and spoken name with each message. The remote site adds or updates the sender's remote user information.
the local site chooses not to send spoken names AND/OR the remote site has not selected the Add/Update Remote Users on this Server option	the local site does not include the spoken names for the senders. The remote site does not add or update the sender's remote user information.

Time stamps updated

When a message is received from a user who already exists in the local database as a temporary remote user, the time stamp of the remote user is updated with the current date and time.

Adding remote users with User Administration

User Administration

With User Administration, you can manually add temporary and permanent remote users. You add remote users one at a time.

User Administration requires you to enter detailed information for each remote user, including

- general information
- settings information

General information

Personal identification information is required for every remote user. This information includes

- last name, first name, and initial
- comments
- title and department

The personal identification information should be as complete as possible.

Check the spelling of the remote user's name. The name that you enter is used by Name Dialing and Name Addressing.

Settings information

Setting information includes the following:

- mailbox number
- primary, secondary, and tertiary DNs
- whether a personal verification is recorded
- whether the remote user can be name-dialed by external callers
- whether the remote user has temporary status or permanent status

Mailbox number

The remote user's mailbox number must be in network format and must include the network prefix or steering code required to address to the mailbox.

For example, if the remote user's mailbox number is 4433 and the ESN prefix is 6233, enter 62334433.

DNs

A remote user can have up to three extension DNs. This means that a caller can dial any one of these numbers and reach the remote user.

The DNs must be in network format and must include the network prefix or steering code required to call the remote user.

Personal verification recorded

When a remote user is added with User Administration, the remote user's own voice cannot be used for the personal verification. The system administrator must record a personal verification for the remote user.

When a personal verification has been recorded for the remote user, the Personal verification recorded box is set to Yes.

When a personal verification has not been recorded for the remote user, the Personal verification recorded box is set to No. Instead of a personal verification, callers will hear the site name and the mailbox number instead.

Name dialable by external callers

The remote user can be name-dialed by external callers who are not part of your network.

Temporary user

The remote user can be either a temporary user or a remote user. This status can be changed as required.

Last access time

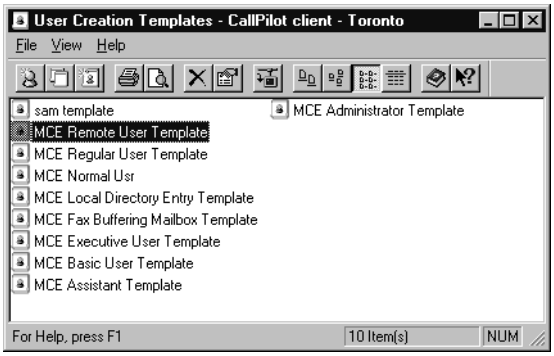
Monitoring the activity of remote users helps to ensure optimal use of the system. For example, if a permanent remote user has not used the system for a year, it may be best to change the user's status to temporary.

When you add a remote user to your database, the last access time is automatically filled in. The last access time is automatically updated whenever the remote user uses the system.

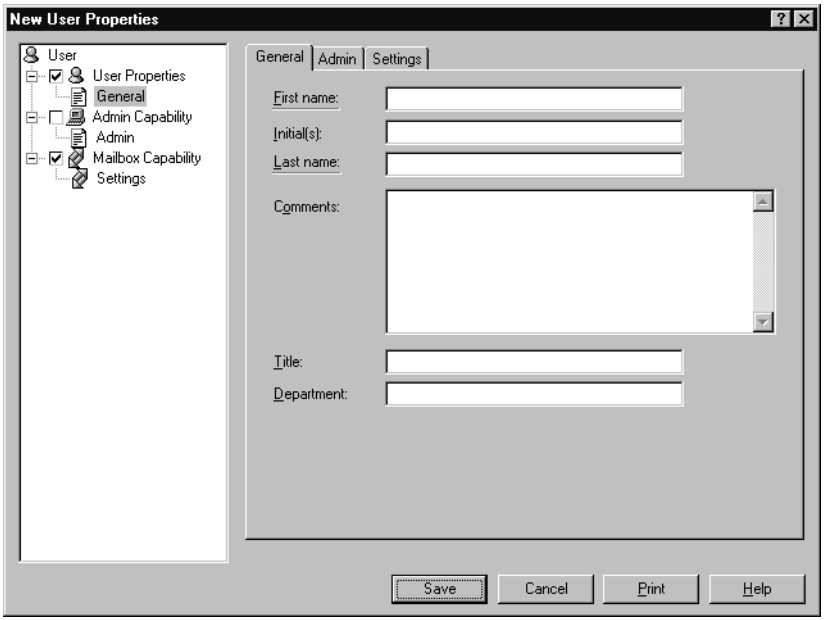
Getting there Nortel SMI > Meridian Application Server > User Administration > User Creation Template

To add a remote user with User Administration

1 In the User Creation Templates list, select Remote User Template.



Result: The New User Properties dialog box appears.



2 Ensure the User Properties and Mailbox Capability check boxes are selected.

3 On the General tab, complete all required information.

4 On the Settings tab, complete all required information.

5 Click Save.

See also

For detailed information about user templates and how to add users, consult the *Basic Administration Guide*.

Maintaining remote users

Introduction

After you have added remote users, you will have to perform regular maintenance activities to keep your system working optimally.

Maintenance activities

Common maintenance activities include

- modifing remote users
- deleting remote users

See also

For information on how to perform the following maintenance tasks, consult the *Basic Administration Guide*:

- Find a remote user.
- List all remote users.
- Print the record of a remote user.

Maintaining records of permanent remote users

Records of permanent remote users

Every permanent remote user has a record in the network database.

You can modify the information about a remote user when required. Modification of remote user records is important for keeping records up-to-date.

Example

Hanna Moos is a permanent remote user at your site. Recently she was promoted and moved from the sales department to a senior management position in marketing. She received a new mailbox number as well.

You modify the information contained in your database to reflect these changes. In addition to making changes to the department and mailbox number fields, you change Hanna's status from temporary to permanent.

Getting there Nortel SMI > Meridian Application Server > User Administration > User Creation Template

To modify a remote user

1. Locate the record of the remote user that you want to modify.
2. Make all necessary modifications.
3. Click Save.

Manually deleting remote voice users

Introduction

You can manually delete any remote user, either temporary and permanent.

Manual deletion is the only way to remove a permanent remote user.

Example

Two remote users, Pedro Afonso and Yang Wang, recently left your company. You would like to remove them from your database. Pedro Afonso is a permanent remote user. If you do not manually remove his record, it will remain in your database indefinitely. Yang Wang is a temporary remote user. If you do not manually remove his record, it will remain in the system until a nightly audit eventually removes it.

Getting there Nortel SMI > Meridian Application Server > User Administration > Users

To manually delete a remote user

1. Locate the remote user that you want to delete.
2. Open the remote user's record to check that it is the correct record.
3. Click Close to close the record.
4. On the File menu, select Delete.

   Result: A confirmation box appears asking you to confirm that you want to delete this record.

5 Click Yes to delete the record.

Click No to keep the record.

chapter 4

Dialing plans and networking

This chapter describes the dialing plans that are supported by networking.

This chapter provides a basic overview of each dialing plan and explains what information is required to implement networking.

In this chapter

About dialing plans and networking solutions

In this section

Overview

Introduction

When you implement a networking solution, you provide detailed information about the dialing plan used by the local site.

It is important to understand dialing plans and their component pieces when implementing a CallPilot networking solution in order to

- gather the required information
- analyze the dialing plan information
- implement a networking solution

Definition: Dialing plan

A dialing plan is the set of rules used by a switch to route a call or message through a network to its destinations.

Before CallPilot can deliver a message to a remote site, it must first determine where that site is and how to connect to it.

System perspective

From a system perspective, the dialing plan determines how to route a message to its proper destination.

User perspective

From a user perspective, the dialing plan determines how users address a message to another user in a private messaging network.

There are two main options. You can give every user in the network a unique mailbox number. Callers will only have to use this number to call another user in the network. However, in very large networks, this may not be feasible. Therefore, you can assign different switches in the messaging network a unique number. A user on a switch can have the same mailbox number as a user on another switch, because the switch number and the mailbox number combined create a unique identifier.

Dialing plan setup

When you begin to implement a networking solution, the dialing plan used by your local site is already configured on the switch.

The decision about which dialing plan is used for each site in your network is already determined when you begin to implement a networking solution. Therefore, during implementation you are simply reflecting the existing plan in your network database.

Even though the dialing plan is already set up, you must understand how to gather the dialing plan information from the switch. You must also understand the implications of the dialing plan for your messaging network.

Dialing plans

CallPilot networking works with four dialing plans:

- Electronic Switched Network (ESN)
- Coordinated Dialing Plan (CDP)
- hybrid dialing plan—ESN and CDP combined
- another dialing plan, such as PSTN

Location code

The basis of an ESN, CDP, or hybrid dialing plan is the location code. A location code is a unique identifier that indicates a particular location within a network.

All dialing plans use a location code. *Location code* is a generic term used for different terms.

For this dialing plan	the location code is called
ESN	ESN prefix ■ consists of ESN access code and ESN location code
CDP	CDP steering code

Uniform dialing plans

Introduction

Regardless of which dialing plan is used, it is strongly recommended that you use a uniform, or standardized, dialing plan for your network.

Definition: Uniform dialing plan

A dialing plan is uniform when all users, regardless of which switch they are on, dial the same way to reach the same recipient. The only exception is that ESN access codes can be different.

A uniform dialing plan offers the following benefits:

- The network is easier to configure and maintain.
- Future growth of the network is allowed.
- Users find it easier to use the network when visiting other sites.

Ensure a uniform dialing plan

If you are upgrading an existing system, analyze the current dialing plans. If necessary, modify them across the network to ensure a uniform dialing plan.

If you are implementing a new networking solution, ensure that the dialing plan is uniform.

Impact of a nonuniform dialing plan

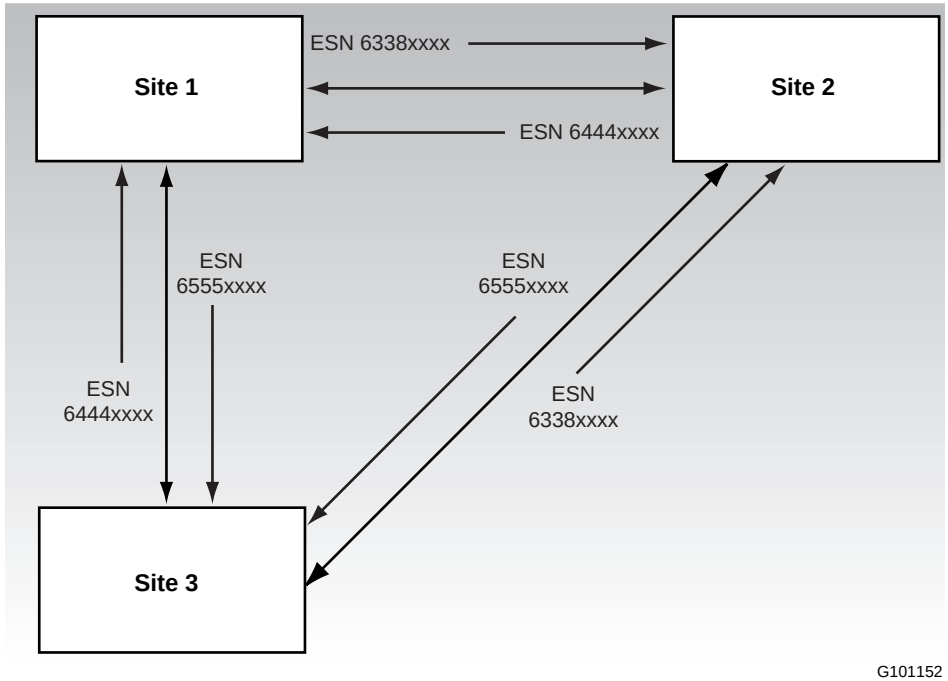
A nonuniform dialing plan is not recommended and should be avoided whenever possible. However, if it is not possible to design a uniform dialing plan, you should understand the impact of a nonuniform dialing plan on your messaging network configuration.

As a messaging network with a nonuniform dialing plan grows, the network becomes increasingly difficult to administer and maintain.

Users who visit different sites in the messaging network will have difficulties, because the dialing plan is unfamiliar.

Example: Uniform dialing plan

The following diagram shows a uniform dialing plan. The messaging network uses an ESN dialing plan. Each site uses the same ESN prefix to reach the other sites in the network.



Nonuniform dialing plan

In some instances, creating a uniform dialing plan is not possible.

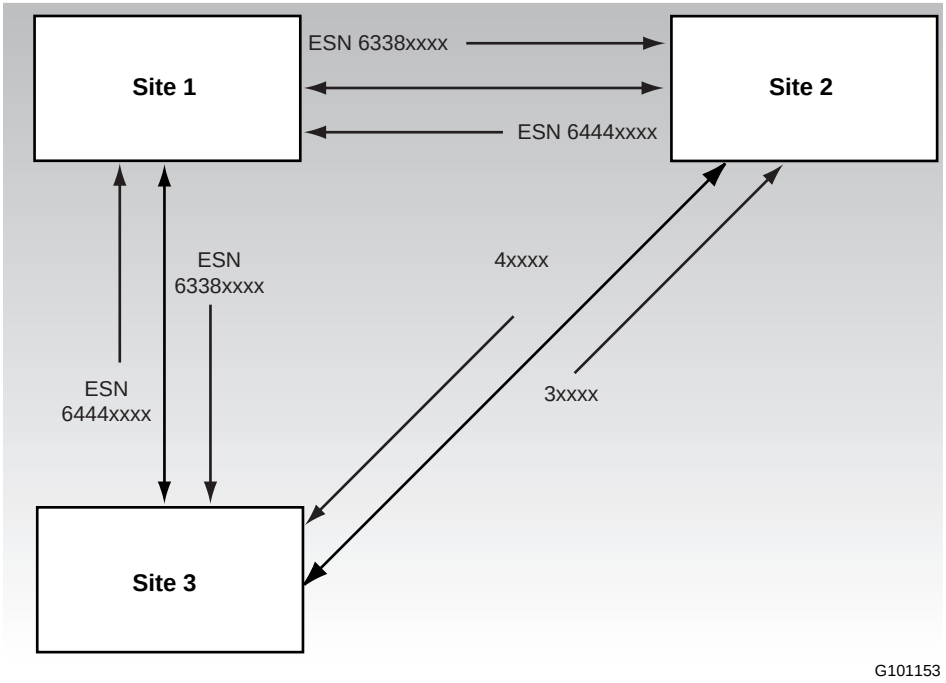
For example, suppose you are implementing CallPilot on an existing messaging network. If an established dialing plan is in place, it may be preferable to leave the nonuniform dialing plan alone. This ensures that users do not have to learn new ways to dial and exchange messages with one another.

Examples: Nonuniform dialing plan

The following diagrams show examples of networks that have nonuniform dialing plans.

Different addresses

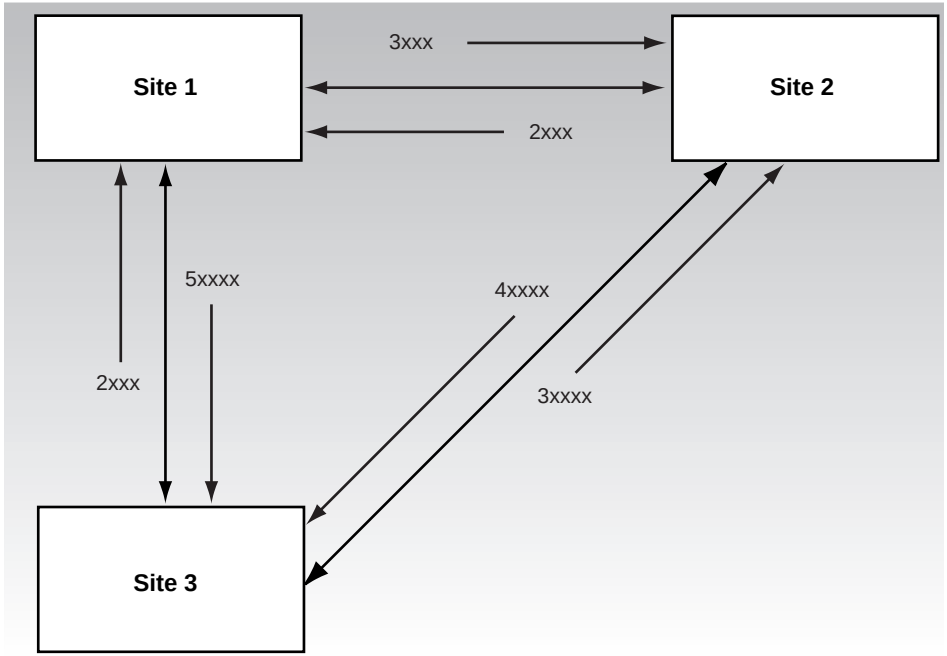
In this example, the dialing plan is nonuniform because users address sites in different ways.



Different CDP steering codes

A dialing plan is considered nonuniform if different sites in the network address other sites in different ways, including using CDP steering codes.

In this example, CDP is used throughout the network, but users at Site 1 send messages to Site 2 by entering 3xxxx, while users at Site 3 enter 4xxxx.



ESN dialing plan

Definition: ESN

An Electronic Switched Network (ESN) is a dialing plan used by organizations in a private messaging network.

ESN prefix

In an ESN dialing plan, every switch in the messaging network is assigned an ESN prefix. The ESN prefix can be up to seven digits long.

The ESN prefix consists of

- an access code
- a unique location code

Access code

An access code is used to access ESN routing in the same way an access code (often 9) is needed to dial out from a private network to a public network. An access code is usually one or two digits long.

Typically, all switches in an ESN network use the same ESN access code, although this is not required. Different ESN access codes do not make the dialing plan nonuniform.

ESN access codes are similar to trunk access codes and are set independently for each switch.

Location code

The location code is a routing prefix that identifies a location within the network. It is usually three digits long but can be up to seven digits long.

Example:

- ESN access code = 6
- ESN location code = 444
- ESN prefix = 6444

Available directory numbers

To expand the range of available directory numbers, you can overlap the leading digits of the local extension with the trailing digits of the ESN prefix.

For example, the directory number 6644000 consists of the local extension, 4000, and the ESN prefix, 6644. The digit 4 is overlapped. It is both the first number of the extension and the last number of the ESN prefix. This overlap enables the use of local extensions in the 4000 to 4999 range.

Calling with an ESN dialing plan

The way a user calls another user depends on whether the recipient is at the local site or a remote site.

Local recipient

To make a telephone call to a user at the same site, the sender enters the extension number only.

Remote recipient

When a user makes a telephone call to a recipient at another site in the network, the ESN dialing plan is not transparent. The user enters additional numbers, the access and location codes, in addition to the recipient's mailbox number, to call a user at another site.

Addressing a message with an ESN dialing plan

An ESN message is addressed in the same way that an ESN call is placed.

Local recipient

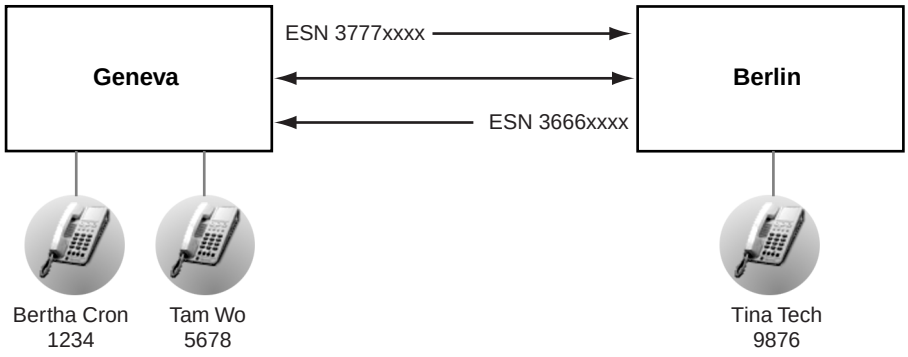
When a user addresses a message to a recipient at the same site, only the recipient's mailbox number is entered.

Remote recipient

When a user addresses a message to a recipient on another switch in the network, the user enters the access and location codes, as well as the recipient's mailbox number, to direct the message.

Example

To send a message to Tam, Bertha enters 5678. To address a message to Tina, Bertha enters the ESN prefix, 3777, and 9876.



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Dialing plans and mailbox addresses

CallPilot uses the dialing plans as mailbox addresses if users have the same number for both their extension and their mailbox.

For	the mailbox consists of	Example
ESN	■ access and location codes. ■ user's extension.	■ access code = 6 ■ location code = 338 ■ mailbox number = 7460 ■ mailbox address = 63387460

CDP

Introduction

A Coordinated Dialing Plan (CDP) is used by organizations in a private messaging network.

Definition: CDP

CDP is a switch feature used to coordinate the dialing plans of users on various switches in your messaging network.

CDP enables a user at one site to dial a user at another site by entering a unique number without access codes and associated pauses for dial tones. CDP is transparent to users.

To send a message to a recipient at the same site, a user enters the extension number.

When a user sends a message to a recipient on another switch in the network, the extension directory number is dialed. No additional numbers are needed, because the extension number itself contains a steering code that directs the call to the appropriate switch.

CDP codes

The number that a user enters to address a message consists of two parts:

- a CDP steering code (one to four digits long)
- the recipient's extension number (one to seven digits long)

Example

Patricia McKenna sends a message to Thomas Brish, who is located on the same switch. Patricia dials Thomas's full DN, 41112. When the system encounters the 4, it determines that the call is intended for a local user, strips off the 4, and sends the message to Thomas.

To send a message to Ana Trujillo, Patricia dials Ana's full address, 51234. When the system encounters the 5, it determines that the call is intended for a user at a remote site, and sends the message to Ana.

Definition: Steering code

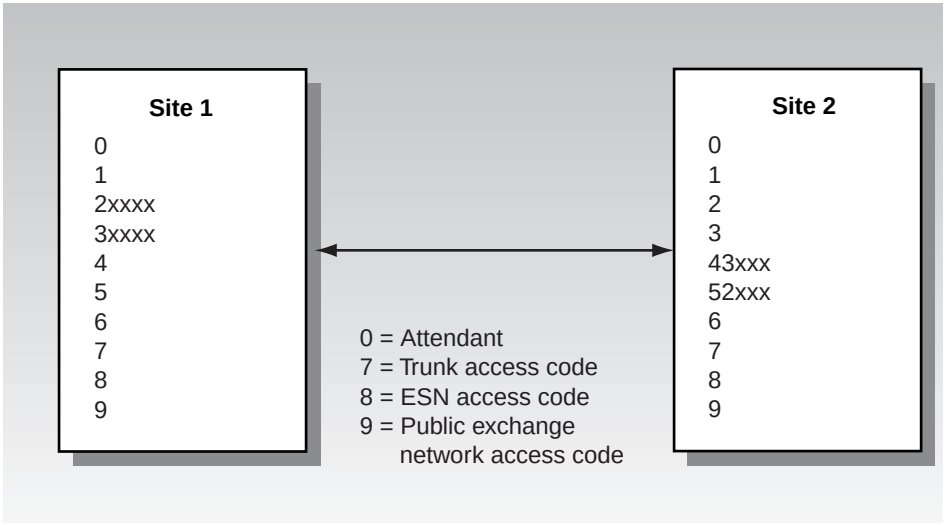
CDP uses steering codes. A steering code is a unique number that is entered by a user before the recipient's extension number. The steering code determines where the message is supposed to go. Each switch is assigned at least one steering code; each switch can have as many as 250 steering codes.

Unique steering codes

The steering codes on a switch must be different from any other assigned DN code on that switch.

The steering codes on a switch must also be different from the steering codes assigned on any other switch.

The following diagram shows an example of steering code availability for two switches. For Site 1, the digits 2–6 are available. Site 1 uses 2 and 3 for the steering code. Site 2 now has the digits 4–6 available. Site 2 uses 4 and 5 for the steering code. The digit 6 remains available.



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Creating steering codes

There are two ways to create a unique number from the CDP steering code and the extension number:

- Combine both parts.
- Keep both parts distinct.

A steering code and an extension number can overlap. For example,

- The extension number is 7121.
- The steering code is 7.
- The 7 is a single-digit overlap.
- A user enters 7121 to reach the recipient, not 77121.

This CDP setup is common. It is convenient for users because dialing any additional numbers is unnecessary, and only the recipient's extension number is required.

However, this CDP setup requires that every extension within the messaging network be unique. A user on one site cannot have the same extension as a user on another site.

The steering code and an extension do not have to overlap. For example, if the extension number is 8976 and the steering code is 44, there is no overlap. A user dials 448976 to reach the recipient.

How a CDP call is placed

To place a call to a recipient, the user dials the steering code followed by the recipient's extension number.

IF the call is being placed	THEN
to a user at the same site	the steering code is deleted, and the call is terminated locally.
to a user at another site	the steering code identifies the recipient's site, and the call is terminated at the remote site.

Extension length

If the CDP steering code is two digits long and the mailbox directory numbers are three digits long, the total extension length is five digits.

If the length of the steering code and the mailbox directory numbers vary across the network, the total extension length must be the same.

For example, at Location 1 the steering code is one digit long and the mailbox directory numbers are four digits long. At Location 2 the steering code is two digits long and the mailbox directory numbers are three digits long. At both locations the total extension length is five digits.

Dialing plans and mailbox addresses

CallPilot uses the dialing plans as mailbox addresses if users have the same number for both their extension and their mailbox.

For	the mailbox consists of	Example
CDP	■ steering code and user's extension	■ steering code = 22 ■ mailbox number = 7460 ■ mailbox address = 227460
	■ steering code and user's extension that overlap	■ steering code = 7 ■ overlap = 1 ■ mailbox number = 7123 ■ mailbox address = 7123, not 77123

Hybrid dialing plan—ESN and CDP combined

Introduction

A messaging network can use both ESN and CDP dialing plans. When both plans are used, the messaging network is said to use a hybrid plan.

Dialing plans and mailbox addresses

CallPilot uses the dialing plans as mailbox addresses if users have the same number for both their extension and their mailbox number.

For	the mailbox consists of	Example
ESN	■ the access and location codes. ■ the user's extension.	■ access code = 6 ■ location code = 338 ■ mailbox number = 7460 ■ mailbox address = 63387460
CDP	■ steering code and user's extension.	■ steering code = 22 ■ mailbox number = 7460 ■ mailbox address = 227460
	■ steering code and user's extension that overlap.	■ steering code = 7 ■ mailbox number = 7123 ■ mailbox address = 7123, not 77123

Another dialing plan

Introduction

If ESN, CDP, or a hybrid dialing plan is not implemented, then the messaging network must use another dialing plan, such as PSTN.

When another dialing plan is used, there are no private dialing codes. Therefore, a user must enter the following to send messages:

- trunk access code (such as 9)
- country and city/area code for long-distance
- exchange code
- mailbox number, typically the extension number

Dialing plans and addressing plans

Introduction

When you implement a networking solution, you specify whether the dialing plan is the same as an addressing plan. If these plans are not the same, you must provide additional information.

ATTENTION!

It is strongly recommended that the dialing plan and the addressing plan be the same.

Dialing plan

A dialing plan specifies how a user makes a telephone call to another user.

Addressing plan

An addressing plan specifies how a user sends a message to another user.

Relationship

The following table shows the relationship between the dialing plan and the addressing plan.

Dialing plan	Addressing plan
ESN (for example, 6338xxxx)	Same as dialing plan strongly recommended
CDP (for example, 55xxx)	Same as dialing plan strongly recommended
Hybrid (for example, 6338xxxx, 55xxx)	Same as dialing plan strongly recommended
Another (for example, PSTN dialing prefix and mailbox, 61213777xxxx)	Choose either ■ format same as dialing plan, or ■ a shortcut (for example, 77xxxx)

Modifying dialing plan information

Introduction

After a dialing plan is established it is rarely modified. Modifications to a dialing plan affect users and may require considerable retraining on the system.

However, in some cases modifications are necessary. In most cases, these modifications are guided by changes made by the switch technician. These changes might be local or remote.

Switch changes

If any changes to the dialing plan are made on a switch, the changes must be reflected in the network databases of all sites in the messaging network.

If changes are made locally, ensure that they are announced to all remote sites.

Messaging network changes

Modifications to the dialing plan are rarely guided by the network administrator. In most cases, the switch technician is responsible for changes to the dialing plan.

Modifying CDP steering codes

Introduction

There may be instances when you must make modifications to the CDP steering codes.

For example, when a user in a messaging network moves from one site to another, the user can continue to use the CDP steering code of the original site. This makes it more convenient for other users who are attempting to reach the moved user.

However, this convenience for users requires considerable work by the switch administrators, system administrators, and network administrators.

ATTENTION!

It is strongly recommended that you weigh the benefits of modifying CDP steering codes for individual users before making the modifications.

Impact of modifications

Modifying CDP steering codes does not affect just the administration of the messaging network.The switches and the user administration records must also be modified.

Impact on switch settings

The switch changes should be made before you make changes to the CDP steering codes in the network database. Your changes must reflect the settings on the switch and cannot be done before the switch changes are made.

Impact on user administration records

Modifications to the CDP steering codes may also require changes to the basic system and User Administration. For example, if you are modifying the CDP steering codes because a user has moved from one site to another site, the following User Administration changes are required:

- The shared distribution lists (SDLs) at both sites must be modified.
- The user must be removed from the system and added to the other system.

Scenario

Tabitha Smithoc, a user in Cairo, moves to the Bahrain site. As Chief Financial Officer, it is important for her to keep her DN to make it easy for other users in the messaging network to reach her.

The Cairo site, which has exactly 1000 users, uses the extension DNs 7000 to 7999. The CDP steering code is 7, and the overlap is 1. Tabitha's extension DN is 7123.

The Bahrain site, which has exactly 1000 users, uses the extension DNs 8000 to 8999. The CDP steering code is 8, and the overlap is 1.

When Tabitha moves to Bahrain, the 7123 extension DN must be added to the Bahrain CDP steering codes as 7123, with an overlap of 4.

However, there is now a conflict between the steering codes in Cairo and Bahrain. Therefore, the CDP steering codes for Cairo must first be changed so that there is no possible conflict with the 7123 steering code used in Bahrain.

The CDP steering codes for Cairo must be changed to the following:

70, 72, 73, 74, 75, 76, 77, 78, 79 (not 71)

710, 711, 713, 714, 715, 716, 717, 718, 719 (not 712)

7220, 7121, 7124, 7125, 7126, 7127, 7128, 7129 (not 7123)

The network databases of all sites in the messaging network must be updated to reflect these changes.

In Bahrain, the CDP steering codes for the Cairo remote switch and the Bahrain local switch must be updated. In Cairo, the CDP steering codes for the Bahrain remote switch and the Cairo local switch must be updated. In Nairobi, the CDP steering codes for both the Cairo and the Bahrain remote switches must be updated.

Dialing plan information

In this section

Gathering dialing plan information

Introduction

Gathering the required information is the first step in implementing every networking solution. Much of the required information is taken from the switch.

When you begin to implement a networking solution, the switch is already correctly installed and configured and is operational for CallPilot.

This means that the switch is set up for dialing between the sites in the messaging network. The dialing plans that are configured on the switch for making telephone calls between sites are also used to exchange messages between sites.

Gather the dialing plan information and analyze it to make sure it is suitable for the networking solution you are implementing.

Gather information

You need the dialing plan information that is configured on your local switch. You must know which dialing plan is used and how all sites in the messaging network dial one another.

The easiest way to gather this information is to ask the switch technician or system administrator.

Gathering information directly from the switch

Gathering information directly from the switch is not recommended, because the required information is found on several switch configuration files called overlays. The information can be difficult and time-consuming to gather.

If you must gather information from the switch, consult the relevant switch documentation for the proper procedures and detailed descriptions of the information in each overlay.

Confirm settings

When the switch was configured, the switch technician likely considered the impact of messaging on the switch and took this impact into account.

However, to ensure that there will be no problems, confirm that the configuration is suitable for the needs of the networking solution or solutions that you are implementing and can handle the anticipated volume of traffic.

If you discover that changes are necessary, complete them before proceeding with your implementation.

Required information

Introduction

Information from the switch must be verified to ensure that it supports networking. Some of the information, such as dialing plan information, is used to configure CallPilot.

Information checklist

The following information is required from the switch configuration:

- dialing plan used:
  - Electronic Switched Network (ESN)
  - Coordinated Dialing Plan (CDP)
  - hybrid dialing plan, combining ESN and CDP
  - another dialing plan, such as public switched telephone network (PSTN)
- if ESN or hybrid dialing plan is used:
  - ESN access code
  - ESN location codes
  - overlap of the location codes with extension numbers
- if CDP or hybrid dialing plan is used:
  - CDP steering codes
  - overlap of steering codes with extension numbers
- if another dialing plan, such as PSTN, is used:
  - dialing prefix information
- range of extension numbers used (for example, 7000–7999)

Gather and confirm information

Gather the following information and confirm that the settings are correct for the messaging network:

- number of trunks—must be adequate for anticipated traffic
- switch settings, such as the Trunk Group Access Restrictions (TGARs), must be suitable for the planned messaging network and not too restrictive
- all extension numbers at this switch location can be dialed *directly* from the local switch
- all extension numbers at this switch location can be dialed in the *same way*

Create a messaging network representation

Introduction

The second major step in implementing any networking solution is to create a messaging network representation.

A messaging network representation provides a complete summary of your messaging network. It contains information about each site and indicates the relationships of sites that communicate with one another.

If sufficiently detailed, a representation is the primary source of information used when implementing a networking solution.

For most messaging networks, a diagram is the most suitable form of representation. For very large messaging networks, however, a spreadsheet is more appropriate.

Definition: Messaging network diagram

A messaging network diagram is a graphical representation of your network. It shows all sites in the network, the protocols implemented at each site, how sites are connected, the protocol used between sites, location codes and names, and dialing plan information.

Definition: Messaging network spreadsheet

A messaging network spreadsheet provides the same information as the diagram, in a spreadsheet format.

Purpose

A detailed representation can be invaluable when setting up a messaging network. The mores detail you supply, the easier you will find the implementation process.

Benefits

There are many benefits to creating a representation of your messaging network. A representation

- offers a clear view of how your network is connected
- gathers all the information required to implement a networking solution in one source
- provides useful information when planning future modifications
- helps during the analysis of traffic issues
- reveals areas where you can improve the messaging network
- provides support personnel with a concise, clear view of your network

Coordinate efforts

Much of the information for your network representation must be provided by the administrators of other sites. For example, you need to know the name of every site.

Protect the representation

Your messaging network representation contains sensitive information. You should properly store and protect it as part of normal security procedures.

Examples of messaging network diagrams

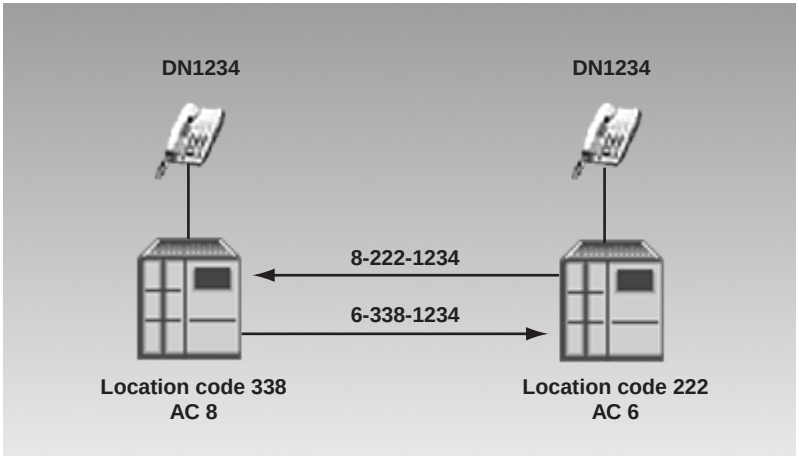
Introduction

The following examples of network diagrams show how each type of dialing plan is treated.

Typical ESN network diagram

A diagram of a typical ESN network provides information about the dialing plan and indicates how users send messages to each other.

In this diagram, users at one site dial the ESN access code, 6, the ESN location code 338, and the recipient's mailbox number to send messages to remote sites.



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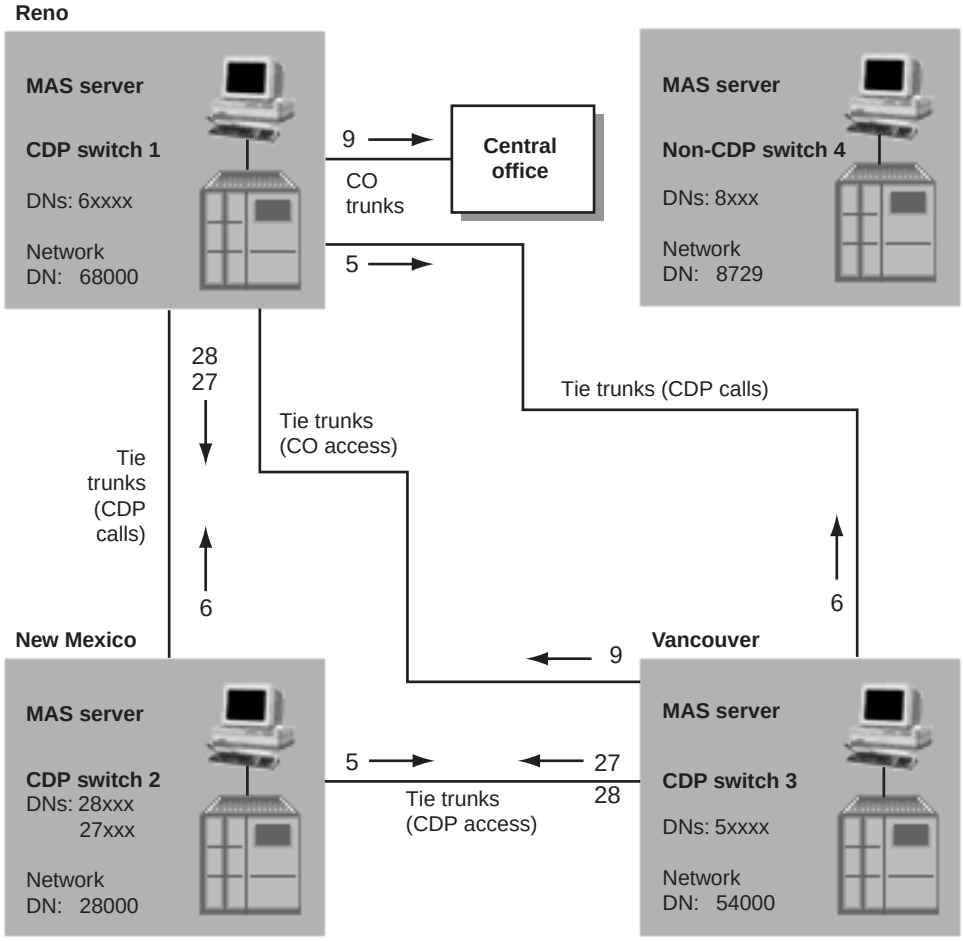
ESN network with an NMS site

When a messaging network includes an NMS site, it is important to include this information in the diagram. Information about all switches in an NMS network are entered when implementing a networking solution.

Typical CDP messaging network diagram

A diagram of a typical CDP messaging network provides information about the dialing plan and indicates how users send messages to one another



In this example,

- the extensions in Reno are numbered 60000 to 69999, and the steering code is 6
- the extensions in New Mexico are numbered 27000 to 28999, and the steering codes are 27 and 28
- the extensions in Vancouver are numbered 50000 to 59999, and the steering code is 5

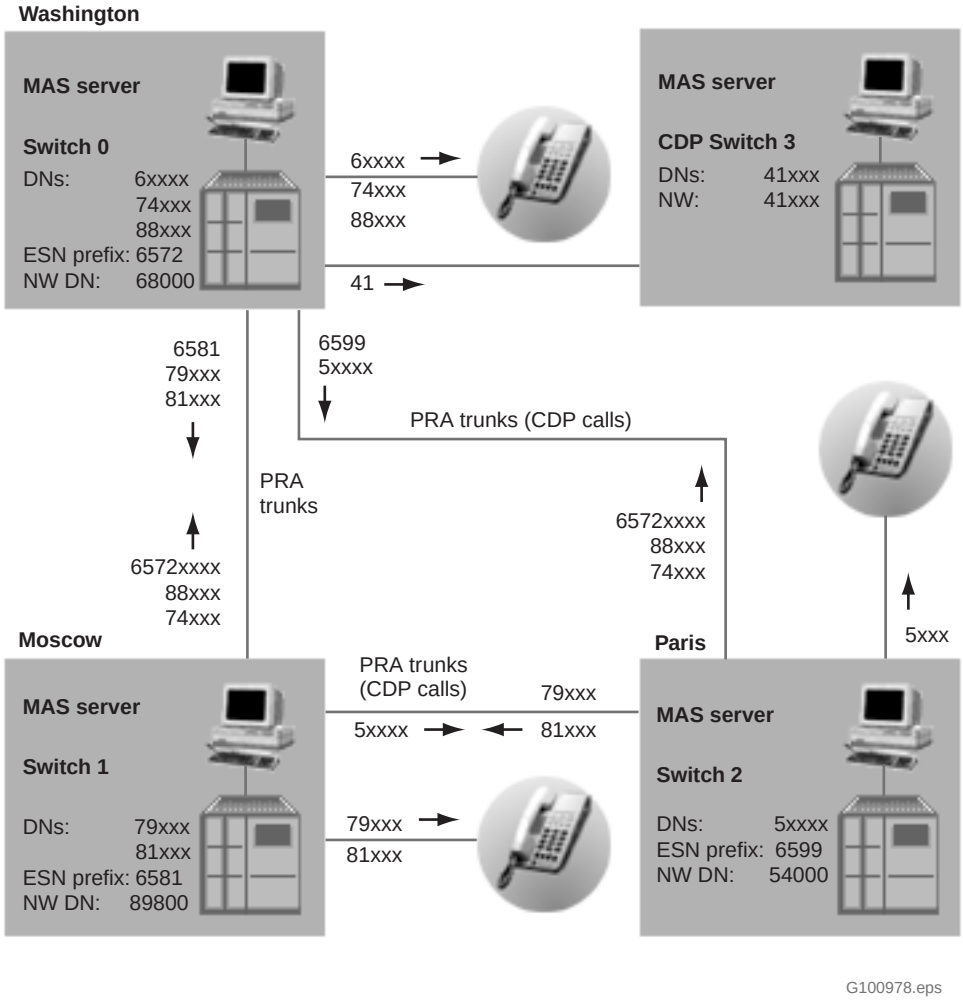
A user, regardless of site, uses the same extension to reach a particular user. For example, a user in Reno dials 27341 to send a message to a user in New Mexico. A remote prefix is not required because the first two digits of the extension, in this case 27, make up the steering code that identifies the site within the messaging network.

This diagram also shows that Reno provides centralized access to the public telephone network.

Hybrid messaging network diagram

A hybrid messaging network, which combines both ESN and CDP dialing plans, is often complicated. However, a messaging network diagram is an easy way to visualize how the sites exchange messages. By adding all dialing plan information to the diagram, you can see how the messaging network works.

In this diagram, Washington, DC, Moscow, and Paris support both ESN and CDP. New York supports CDP only.



How users send messages to other sites is described in the following table:

This site	dials
Washington, DC	Moscow with ■ 6581xxxxx using ESN. ■ 79xxx, 81xxx, 8xxxx using CDP. Paris with ■ 6599xxxxx using ESN. ■ 5xxxx using CDP.
Moscow	Washington with ■ 6572xxxxx using ESN. ■ 74xxx and 88xxx using CDP. Paris with ■ 6599xxxxx using ESN. ■ 5xxxx using CDP. New York with ■ 41xxx using CDP.
Paris	Washington with ■ 6572xxxxx with ESN. ■ 74xxx and 88xxx using CDP. Moscow with ■ 6581xxxxx using ESN. ■ 79xxx and 81xxx using CDP. New York with ■ 41xxx using CDP.

This site	dials
New York	Washington, DC with ■ 74xxx and 88xxx using CDP. Moscow with ■ 79xxx and 81xxx using CDP. Paris with ■ 5xxxx using CDP.

Messaging network with another dialing plan

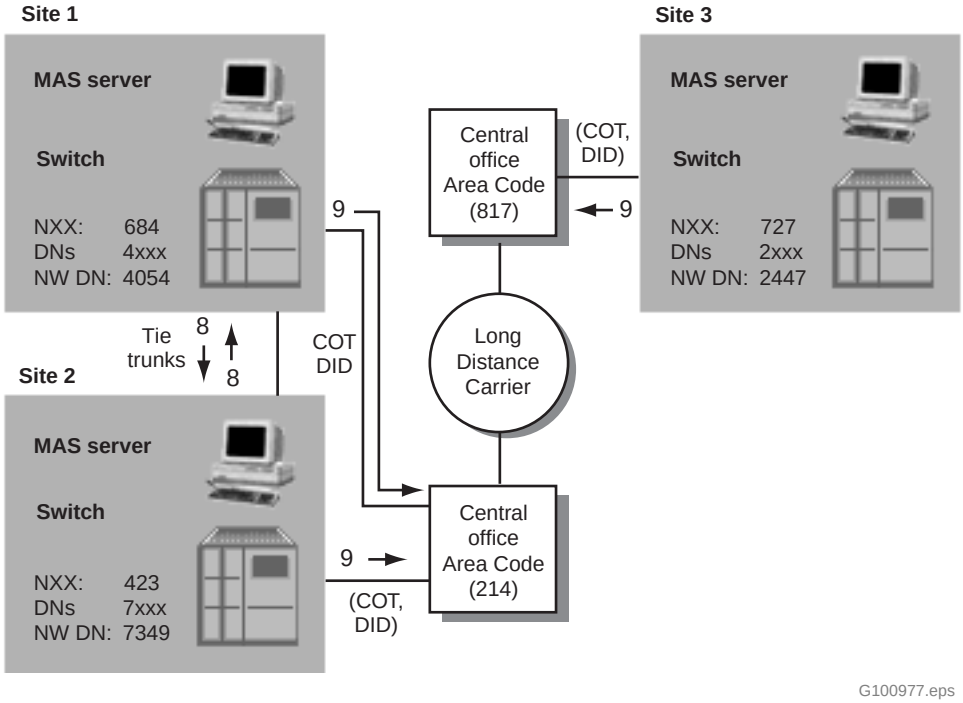
If your messaging network is not using ESN, CDP, or a hybrid dialing plan, you are using another dialing plan.

If you are using another dialing plan, you must use an alternate means of addressing messages. You can do this by designating a mailbox prefix for the site.

Users have some means of dialing the users at the site. For example, they can use an access code and a public switch number. The call may have to travel through a switchboard if the users are not directly dialable. You can set the mailbox prefixes to something related to the dialing plan if you want to make it easier for users to remember what to enter. For example, for a system in the 416 area code, use the prefix 8416.

Example 1

The following diagram illustrates a messaging network that uses another dialing plan, in this example, tie lines.



When a messaging network uses another dialing plan, sites may be configured to use different dialing prefixes to reach a specific remote site. However, CallPilot is unable to represent the dialing plan.

A tie line between sites is an example of a network without a representable dialing plan. In this case, a mailbox prefix should be entered to allow users to compose to mailboxes at the remote site, because the mailbox numbering plan is independent of the dialing plan.

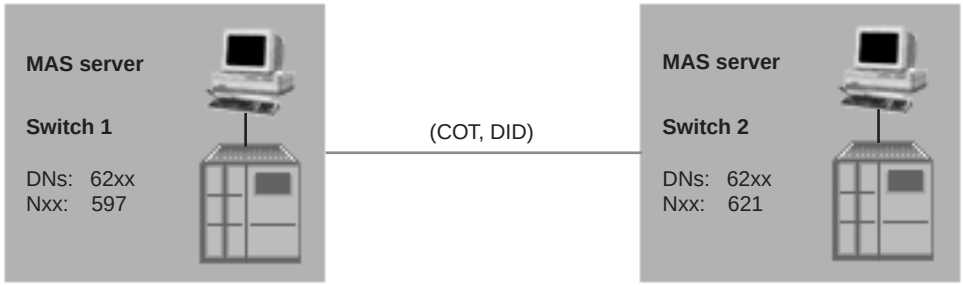
When there is no specified dialing plan, CallPilot uses the trunk access code and the following:

For	the access code is followed by
long-distance calls	NPA + Nxx + xxxx
local calls	Nxx + xxxx
tie-line calls	xxxx

When entering network connection DNs for remote sites, you must provide for this format.

Example 2

The following diagram shows another network with another dialing plan. In this network, each site uses the same extension directory numbers. The exchange code makes each site in the network unique.



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chapter 5

Implementing CallPilot networking

This chapter is an overview of the process for implementing CallPilot networking solutions.

In this chapter

About implementing networking

In this section

Overview

Introduction

Implementing CallPilot networking requires much planning and coordination between the network administrators of the various sites.

Time spent planning will save you time during implementation. Planning will also save you time troubleshooting after the implementation.

To properly plan for implementation, you must understand the process and what you are expected to do. You must also look at the implementation on paper. Analyze it to determine if there are any conflicts or missing information.

The complexity of the implementation depends on many factors, including the number of sites in the network and the type of dialing plan used.

Complexity

If you are designing a completely new messaging network in which every site uses CallPilot, you can design a simple and elegant messaging network.

However, if your implementation is an upgrade or addition to an existing messaging network that brings together many different types of systems and complicated, nonuniform dialing plans, the process may be more complicated.

No matter what type of implementation you are performing, following the guidelines described in the networking guides will simplify the process.

Network administrators

The network administrator is the person responsible for the messaging network at one or more sites. Some messaging networks have one network administrator for all sites.

Determine who is responsible for implementing and administering a site as your first step in planning.

ATTENTION!

It is strongly recommended that one network administrator be responsible for coordinating the implementation and administration of the entire messaging network. Communication among sites is critical to the messaging network. Having a coordinator can simplify this process.

See also

The information in this *Networking Planning Guide* provides a general overview of the implementation process. More detailed information is found in the implementation and administration guides of each networking solution.

Before beginning to implement any networking solution, read the relevant implementation and administration guides.

ATTENTION!

It is very important that you understand all the information that you are expected to provide during implementation and coordinate this information with the network administrators of all other sites.

Basic design of the messaging network

Introduction

The basic design of your messaging network is already complete.

The planning engineers who determined how CallPilot could be used in your messaging network also determined which networking solutions are to be installed on each site, how many sites are in the messaging network, and which networking protocols are used.

Implementation is incremental

Implementation of a networking solution is an incremental activity. When you begin to implement a networking solution, the following is already completed:

- The messaging server is set up and configured for local use.
- The switch location is set up and configured for local use; switch security features were configured with networking in mind.
- The appropriate number of trunks are available.
- The appropriate number of channels are available.

Completion of basic design

The network administrators must complete the basic design, which includes

- assigning unique, useful names to every site in the messaging network
- identifying the NMS sites in the messaging network
- determining the dialing plan used among sites
- determining the networking solution used among sites

Installation and implementation

Introduction

Throughout the CallPilot networking guides, a distinction is made between a networking solution that is installed and one that is implemented.

Installation

A networking solution is installed on your system if the keycode that enables it is purchased. Installation implies that the networking solution is potentially available on your site. Installation does not mean that the networking solution is currently available.

Implementation

To be available on your site, the networking solution must not only be installed, it must also be implemented.

Implementation means that the networking solution is properly configured and that the network database is set up.

Difference between installation and implementation

The difference between installation and implementation is important.

When some networking solutions are installed on your local system, they affect the process of implementation. For example, suppose you have Integrated AMIS Networking and Enterprise Networking installed on your system. Several boxes on the dialog boxes that you must complete during the implementation of Integrated AMIS Networking are enabled because Enterprise Networking is also installed. In some instances, you must enter temporary information, which is called a placeholder, into those boxes before you are allowed to add the information to the network database.

See also

For a description of the keycodes related to networking, consult Networking solution keycodes on page 78.

Recommended order of implementation

Introduction

If you are implementing one networking solution, follow the procedures in the relevant implementation and administration guide.

If you are implementing more than one networking solution on your local site, you must consider the order of implementation.

Recommended order

Although CallPilot networking solutions can be implemented in any order, the process is easier if you follow this recommended order:

- Network Message Service (NMS)
- AMIS Networking or Integrated AMIS Networking
- Enterprise Networking
- VPIM Networking

Note: If your local site is also implementing desktop messaging that uses Internet Mail Access Protocol (IMAP), it should be implemented after NMS and before any other networking solutions. For more on the implementation of IMAP, see the *Advanced Administration Guide*.

Example

Your local site has VPIM Networking, NMS, and Enterprise Networking installed. Implement the networking solutions in the following order:

- NMS
- Enterprise Networking
- VPIM Networking

Importance of order

You must implement the networking solutions installed on your local system in this order because they are incremental. Information that you provide during one implementation is also used during the next.

The implementation and administration guides are designed to be used in this order.

Implementing and testing all NMS sites in the messaging network before implementing any other networking solution is strongly recommended. Adding a remote NMS site to a network database can be a lot of work.

Note: It is strongly recommended that you ensure that all information is correct before releasing it to remote network administrators.

AMIS Networking or Integrated AMIS Networking

If your local site is using the AMIS protocol to exchange messages with open sites only, implement AMIS Networking. Follow the procedures in the *AMIS Networking Implementation and Administration Guide*.

If your local site is using the AMIS protocol to exchange messages with only integrated sites, or with both integrated and open sites, implement Integrated AMIS Networking. Follow the procedures in the *Integrated AMIS Networking Implementation and Administration Guide*.

Implementation concepts

Introduction

The implementation process for each of the networking solutions is described in detail in the implementation and administration guides.

This implementation overview provides a general description of the implementation process and introduces some of the key concepts necessary to understand the process.

Scenarios

There are several possible scenarios for implementing your CallPilot system:

- Your site is just one site in a new messaging network of CallPilot systems.
- Your site is a new site added to an existing, compatible messaging network.
- Your site is just one site in an existing messaging system that is being upgraded to CallPilot.
- Your site is part of an existing messaging system and is being upgraded, while other sites are not being upgraded.

The process that you follow is determined somewhat by your particular situation.

New messaging network

If your site is part of a new messaging network, much preliminary planning must be done before you can install any networking solutions. Fortunately, this planning should result in a messaging network that is perfectly designed for CallPilot networking.

Upgraded messaging network or site

If your site is part of an existing network and is being upgraded to CallPilot, the implementation process is somewhat different.

For example, a dialing plan already exists. CallPilot networking is easiest to implement and maintain when a messaging network uses a uniform dialing plan. However, it is unlikely that you will be able to change the entire dialing plan to suit your preferences. Therefore, you may have to implement the networking solution or solutions using a dialing plan that is more complicated to implement and maintain.

However, if your site is being upgraded, you can migrate much of the existing information into the network database. The Migration feature of CallPilot automates the movement of data.

Key concepts

In this section

Network views

Introduction

Your view of your messaging network depends on which site you are on. From your perspective, only one site is local. All other sites are remote.

For example, suppose your network consists of five sites. From your perspective your site is local, while all others are remote. However, the administrator of another site sees that site as local and all others as remote.

Network views are relative

In most cases, the site where you are physically located is the local site. However, if the necessary permissions are set up on the system, you can administer a remote site. Even though the site is physically remote, from your perspective it is the local site.

The following table provides some examples:

IF you are	THEN in the network database
located at Site 1	Site 1 is the local site; all other sites are remote sites.
located at Site 2	Site 2 is the local site; all other sites are remote sites.
dialing in to Site 2 and performing network administration from another site	Site 2 is the local site; all other sites are remote sites.
dialing in to Site 1 and performing network administration from another site	Site 1 is the local site; all other sites are remote sites.

Local and remote administration

Introduction

You can implement and administer a CallPilot networking site either locally or remotely.

Local administration

In most networks, each site has a messaging network administrator who is responsible for the system.

Advantages

Having an on-site administrator has two advantages:

- the potential for greater understanding of the site's unique messaging requirements
- someone with a good understanding of the system

Disadvantages

However, there are some disadvantages to having administrators at each site:

- higher costs
- an increased possibility that a change made at one site is not communicated quickly enough to all other site administrators
- the increased likelihood of scattered network records, making it difficult to troubleshoot the system

Remote administration

CallPilot's remote administration capability allows you to implement and administer sites remotely.

If you are implementing and administering sites remotely, follow the procedures in this guide for each site.

It is important to note, however, that whenever you are administering a site remotely, you are acting as the local administrator of that site.

Example: Remote site administration

Sandra Kapinski is the messaging network administrator of the New York site. The administrator of the Boston site is taking a temporary leave of absence. Sandra assumes responsibility for the Boston site from New York.

When Sandra works on the New York site, New York is the local server. When she works on the Boston site, Boston is the local server. So even though Sandra is physically in New York, when she works on the Boston site, she is acting as Boston's local administrator.

Site security

CallPilot protects site configuration from unauthorized users. To implement and administer sites remotely, you must have the proper authorization and passwords.

How to work remotely

Implementing and administering sites remotely involves

- adding a new site to the MAT tree view
- adding a system to the site
- accessing the system and completing all required work

Getting there Nortel SMI > MAT Navigator

To add a new site

1. On the Configuration menu, select Add Site.

   Result: The New Site Properties dialog box appears.

2. Complete all required information.

3. Click Save.

   Result: The new site appears in the MAT tree view.

To add a new system

1. In the MAT tree view, highlight the site you added.
2. On the Configuration menu, select Add System.

   Result: The Add System dialog box appears.
3. Select Meridian Application Server, then click OK.

   Result: The New System Properties dialog box appears.
4. Complete the New System Properties dialog box, then click Save.

   Result: The new system appears in the MAT tree view.

To access the new system

1. In the MAT tree view, select the system that you wish to work on.
2. On the File menu, select Open.

   Result: A security dialog box appears.
3. Enter your name and password.

   Result: If you have access to the system, the system window for that site appears.
4. Work on the site as if you were working locally.

See also

For more information about working with the MAT Navigator, consult the relevant *Advanced Administration Guide*.

Multi-administrator environments

Introduction

Multiple administration is a standard database management feature that enables many administrators to work on a database at the same time.

CallPilot allows up to eight network administrators to work on your network database at the same time.

Advantages

Multiple administration offers several advantages, including

- shared knowledge of network database maintenance
- faster implementation

How it works

A messaging network administrator selects an item in the Message Delivery Configuration tree view and opens it.

If the item is currently open and is being used by another administrator, a message appears stating that read-only access is possible at this time.

An administrator can save work to the network database only after the read-write file is saved.

Refresh feature

More than one messaging network administrator can work on the configuration of satellite switch locations for a single site. Although this can cause confusion, you can avoid problems by taking advantage of the Refresh feature.

The Message Delivery Configuration tree view does not automatically refresh the views of all messaging network administrators. For this reason, if you are working in a multiple administration environment, click the Refresh button frequently. This ensures that the tree view you see is the most current.

Refreshing the view is especially important if you are deleting a remote site with satellite switch locations. A remote site cannot be deleted unless all satellite switch locations, in addition to the remote messaging server, are selected.

Understanding the interface

In this section

Accessing the networking applications

Introduction

There are two main applications that you use to implement CallPilot networking solutions:

- Message Delivery Configuration
- Messaging Network Configuration

Message Delivery Configuration

The Message Delivery Configuration application opens a dialog box where the different networking protocols are administered.

Messaging Network Configuration

The Messaging Network Configuration application opens a dialog box where the local site and all remote sites are administered.

Cancel button

Introduction

Every Properties dialog box has a Cancel button. You must understand how the Cancel button works to ensure that you do not inadvertently lose configuration information that you have entered.

What Cancel does

When you enter configuration information on a Properties dialog box, the information is not saved to the network database until you press Save.

This means that when you press Cancel, all of the information on the Properties dialog box is deleted. If the dialog box consists of more than one tab, all tabs are affected.

Therefore, use the Cancel button only if you want to remove all information from the dialog box.

Delete specific information

To delete specific information from a field, use the standard Windows methods, such as the Backspace or Delete keys.

The Message Delivery Configuration dialog box

Introduction

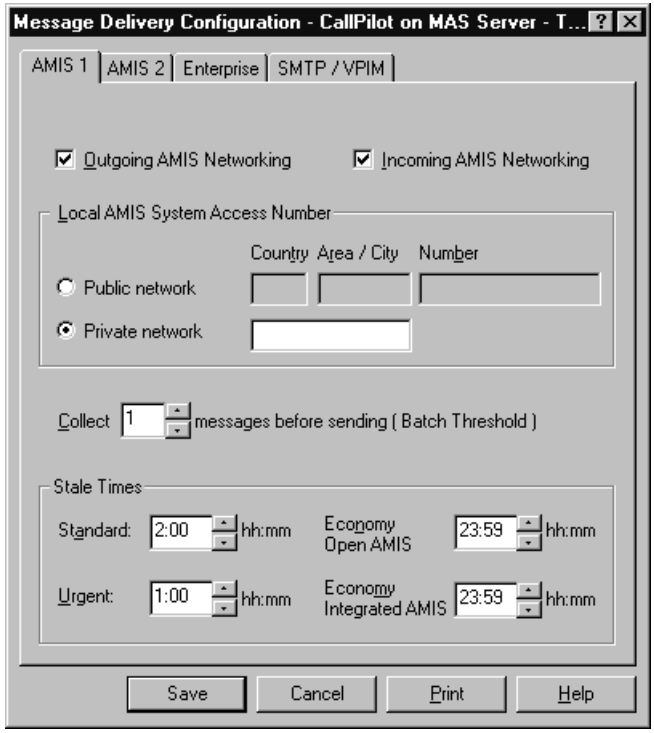
The Message Delivery Configuration dialog box appears in the Nortel System Management Interface only if AMIS Networking, Enterprise Networking, or VPIM Networking is installed.

The dialog box contains configuration information for each of the protocols used by networking.

Networking solutions

You must complete the Message Delivery Configuration dialog box to implement the following networking solutions:

- AMIS Networking
- Integrated AMIS Networking
- Enterprise Networking
- VPIM Networking



Network Message Service (NMS)

The Message Delivery Configuration dialog box is not required to implement NMS.

Enabled tabs

Tabs are enabled only if the related networking solution is installed.

To print the Message Delivery Configuration parameters

To print the information on the dialog box, click Print.

Result: The contents of all four tabs are printed.

The Messaging Network Configuration tree view

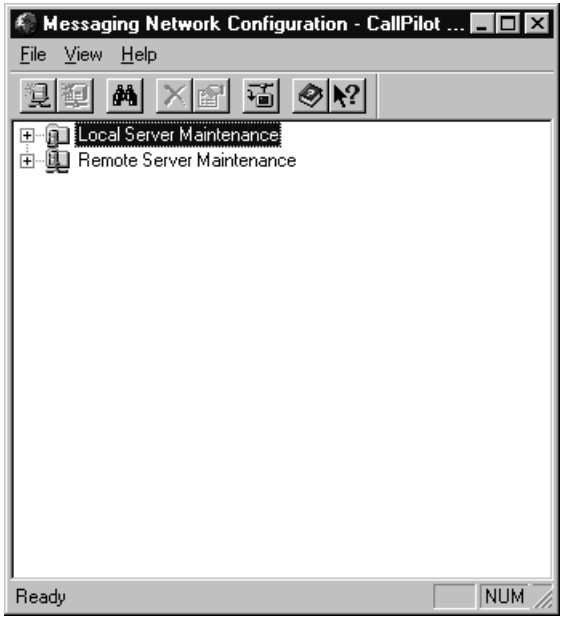
Introduction

The Messaging Network Configuration dialog box contains a graphical representation of your messaging network. Using a tree view, it shows the local site and all remote sites in the messaging network.

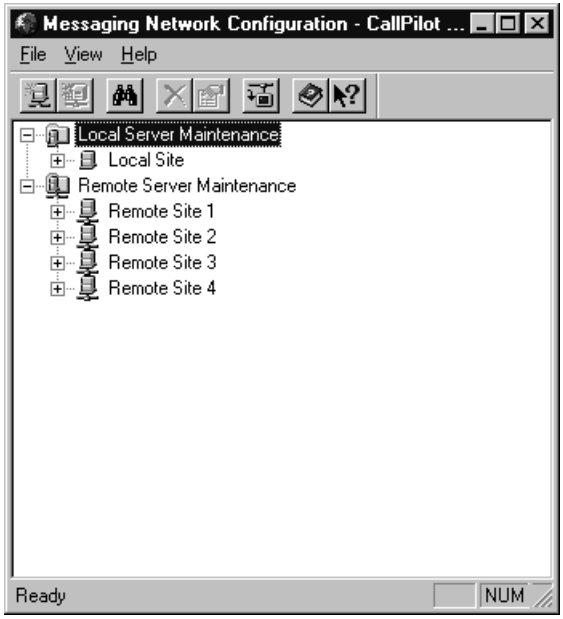
A site consists of a messaging server and a prime switch location. An NMS site also includes the satellite switch locations. In the tree view, a site is represented by the messaging server. Open the messaging server of a site to see its switch locations.

Example

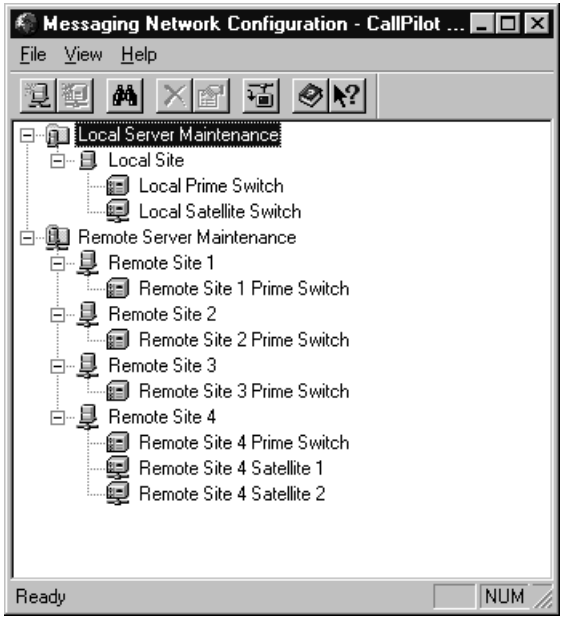
The following messaging network configuration tree view is entirely closed.



The following messaging network configuration tree view shows all sites.



The following messaging network configuration tree view shows all sites fully open.



Uses of the tree view

From the Messaging Network Configuration tree view, you can add, remove, and modify the configuration of all messaging servers and switch locations in your messaging network.

Capacity

The Messaging Network Configuration tree view can contain up to 500 sites. An NMS site can have up to 59 satellite switch locations.

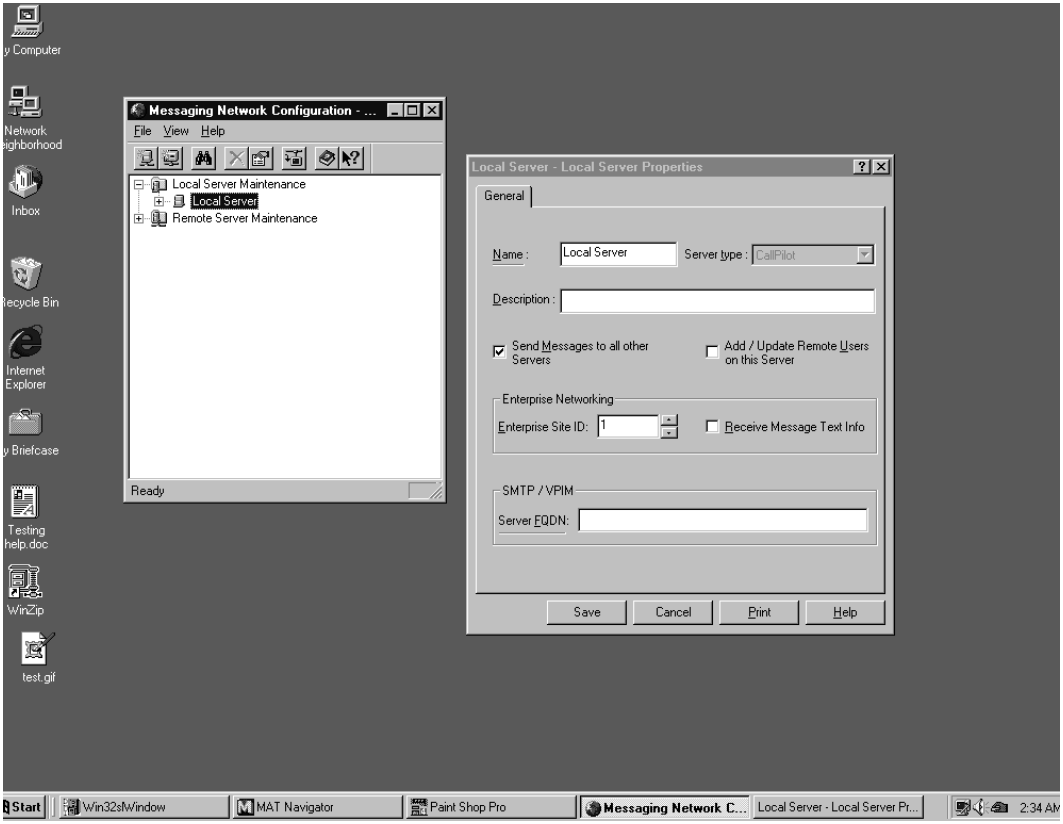
Therefore, if CallPilot is used to its full capacity, your Messaging Network Configuration tree view can contain 30 000 items. It is therefore important to be very organized when implementing large messaging networks.

If the size of your network exceeds the size of the dialog box, a scroll bar appears on the left-hand side of the dialog box.

Recommended procedure

Keep the Messaging Network Configuration tree view dialog box open and visible on your screen while working with the Properties dialog box of a messaging server or switch location. This will help you remain properly oriented.

The following screen shows the Message Delivery Configuration tree view dialog box and the Message Delivery Configuration—Local Server Properties dialog box open on the same screen.



Local messaging server and prime switch location

The local messaging server and local prime switch location are added to the Messaging Network Configuration tree view automatically when CallPilot is installed on your system. They cannot be deleted.

Remote messaging servers and switch locations

Every messaging server is associated with a prime switch location. For this reason, when you add a remote messaging server to your messaging network, a prime switch location is automatically created for that remote messaging server. By default, the prime switch location is given the same name as the messaging server.

Local and satellite switches

The messaging network configuration shows which sites in the network are NMS sites. NMS sites have one or more satellite switch locations in addition to the prime switch location.

If your local site is an NMS site, you should have implemented and tested NMS before beginning to implement Integrated AMIS Networking. Therefore, all satellite switch locations for your local site are already listed in your tree view.

Organization

When implementing and maintaining large networks, it can be difficult to keep track of sites, messaging servers, and switch locations. For this reason, CallPilot automates some of the organization for you.

Local site

The local site is always shown at the top of the tree view, under the Local Server Maintenance branch.

If the local site is an NMS site, the prime switch location is always listed directly below the messaging server. The satellite switch locations are listed in alphabetical order below the prime switch location.

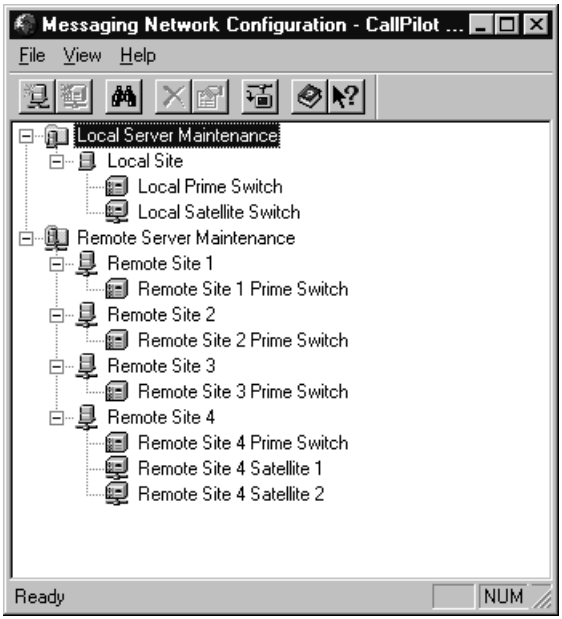
Remote sites

Remote sites are shown below the Remote Server Maintenance branch. Remote sites are listed in alphabetical order.

If the remote site is an NMS site, the first switch listed below the server is the prime switch. The satellite switches are listed in alphabetical order below the prime switch.

Example

The following Messaging Network Configuration dialog box shows the tree view of a messaging network consisting of five sites. Each site's folder is expanded. The local site is an NMS site and has one satellite switch location. Remote site 4 is also an NMS site and has two satellite switch locations.



Working with the dialog box

Most tasks can be performed in several ways. Tasks can be performed from the menus, shortcut keys, and toolbar buttons.

Status bar and toolbar

The tree view has a status bar and a toolbar that can be displayed or hidden.

The status bar is located at the bottom of the dialog box and provides brief descriptions of what each menu command or toolbar button does. To display the status bar, on the View menu, select Status bar. Repeat the command to hide the status bar.

The Messaging Network Configuration toolbar is located below the menu list. The buttons on the toolbar provide quick access to the commands you most commonly use when configuring your messaging network. To display the toolbar, on the View menu, select Toolbar. Repeat the command to hide the toolbar.

The toolbar duplicates many of the commands on the menu bar.

Opening and closing the Messaging Network Configuration dialog box

Introduction

The Messaging Network Configuration dialog box contains the tree view.

From the tree view, you can view all the sites in your messaging network with which your local site exchanges messages. You can also add, delete, and modify the messaging servers and switch locations.

To open the Messaging Network Configuration dialog box

1. In the Nortel SMI window, select Meridian Application Server.
2. Select CallPilot.
3. Select Networking.
4. Select Messaging Network Configuration.

   Result: The Messaging Network Configuration dialog box appears, showing the tree view.

Contents cannot be printed

You cannot print the contents of your Messaging Network Configuration tree view.

However, you can print the configuration details contained in the Properties dialog boxes for every messaging server and switch location.

Closing the Messaging Network Configuration dialog box

Close the Messaging Network Configuration dialog box when you have finished working on the configuration of the messaging servers and switch locations.

You do not have to complete the configuration of your entire messaging network at one time. When you quit, your current configuration is saved in the network database. You can complete the configuration at a convenient time.

To close the Messaging Network Configuration dialog box

1 On the File menu, select Close.

Result: If you have modified items in the tree view, CallPilot prompts you to confirm if you want to save these modifications before closing.

2 To save your work before quitting, click Yes.

To quit without saving, click No.

Tip: You can also exit by clicking the Close button.

Working with a Properties dialog box

Introduction

Every messaging server and switch location in the Messaging Network Configuration tree view has a Properties dialog box. The Properties dialog box contains configuration settings.

You can open the Properties dialog box for any messaging server or switch location in the messaging network from the Messaging Network Configuration tree view.

Getting there Nortel SMI > Meridian Application Server > CallPilot > Networking > Messaging Network Configuration

To open a Properties dialog box

1. Highlight the messaging server or switch location you are interested in.
2. On the File menu, select Properties.

   Result: The Properties dialog box of the highlighted item appears.

   Tip: Open Properties dialog boxes in any of the following ways:

   - Highlight the item and double-click.
   - Highlight the item and click the Properties icon.
   - Highlight the item and right-click. On the pop-up menu, click Properties.

   Note: You can have more than one Properties dialog box open at one time.

Properties dialog box titles

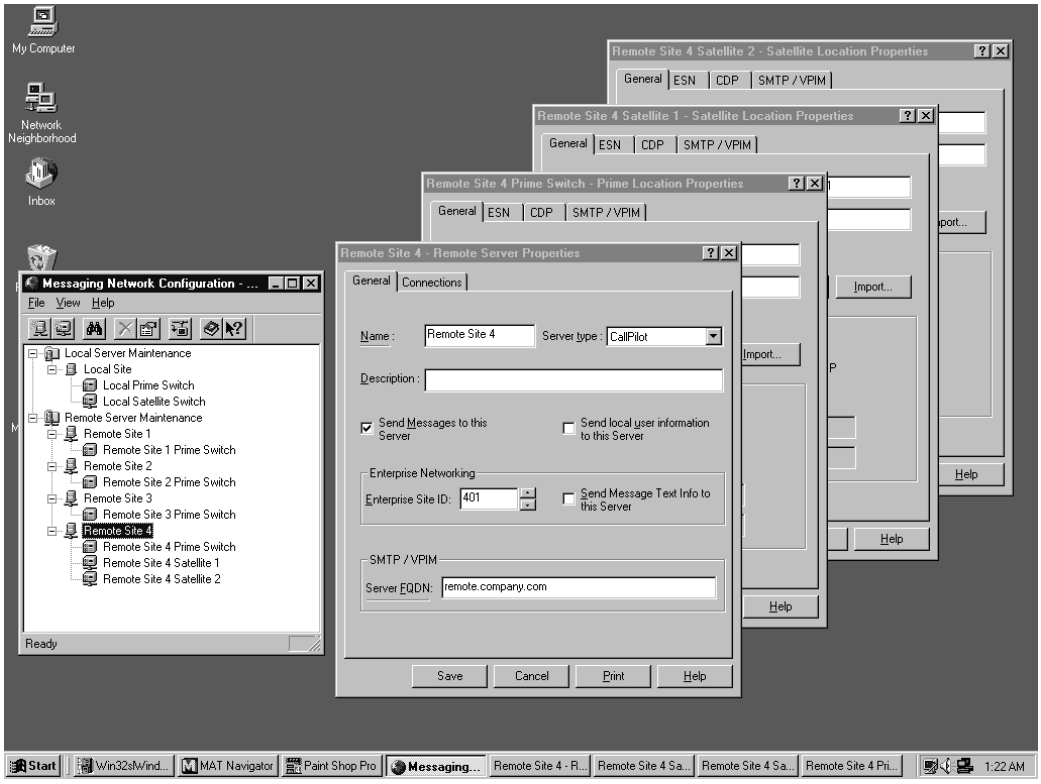
The title bar of a Properties dialog box ensures that you know which item the configuration information belongs to. It is especially important to check the title bar if you have more than one dialog box open at a time. Carefully check the title bars to ensure that information belonging to one item is not added to the incorrect dialog box.

The title bar of a Properties dialog box contains two pieces of information:

- the name assigned to the messaging server or switch location
- one of the following Properties dialog box types:
  - Local Server Properties
  - Remote Server Properties
  - Prime Location Properties
  - Satellite Location Properties

Example

The following screen shows a Messaging Network Configuration tree view and four open Properties dialog boxes. Notice how the title bars of the Properties dialog boxes correspond to the names in the Messaging Network Configuration tree view.



Printing a Properties dialog box

Introduction

The contents of every Properties dialog box can be printed.

Printouts of each Properties dialog box are an important part of your messaging network history. Store dated printouts with your network diagram and other records.

Getting there Nortel SMI > Meridian Application Server > CallPilot > Networking > Messaging Network Configuration

To print a Properties dialog box

1. From the Messaging Network Configuration tree view, open the Properties dialog box that you want to print.

   Result: The selected Properties dialog box opens.

2. Click Print.

   Result: The contents of the selected Properties dialog box are printed. The printout includes the contents of all tabs.

Validation

Introduction

Validation is the process of checking the information entered during configuration before saving it to the database.

Validation identifies any problems with the information that you have entered before it is added to the network database. This minimizes configuration problems and helps to ensure that the information that you have entered will work.

Levels of validation

There are two levels of validation:

- field
- record

Field validation

Field validation ensures that you can enter only valid characters into a box on a dialog box.

For example, if a box accepts only numbers, you are not allowed to enter letters.

If you are unable to enter characters into a box and do not know why they are being rejected, use the What is this? Help feature for the field. A popup appears explaining what the box does as well as its default value and restrictions, if any.

Record validation

Record validation ensures that the information you have entered while completing a dialog box is complete, is consistent, and does not conflict with any other records in the network database.

Examples

Many boxes must be unique within the site. If a site uses the Coordinated Dialing Plan (CDP), up to 250 steering codes can be defined. Every steering code must be unique for the site. However, the same steering codes can be used at other sites.

Other boxes must be unique across the messaging network. For example, every messaging server must have a unique name.

Unique information

Introduction

As you configure the messaging network, you must provide information that is unique. When determining if information is unique, you must consider two factors:

- the context in which an item is unique
- the comparison against which an item is unique

Throughout the guides, whenever unique information is required, both factors are defined.

Context

There are different contexts in which an item must be unique.

Some items must be unique for the local site. Other items must be unique in the local network database, that is, the local site and all remote sites with which the local site exchanges messages.

Comparison

An item rarely has to be absolutely unique. In most cases, it must be unique only against certain other items.

Uniqueness and validation

It is important to keep the uniqueness requirements in mind when implementing a messaging network, because not all boxes are automatically validated for uniqueness.

Whenever a box must be unique against local information or information in the local network database, it is automatically validated. If a box is not unique as required, an error is generated and the information must be corrected before it is accepted.

However, several boxes must be unique in the entire messaging network. The information in various network databases cannot be checked automatically. For these types of boxes, the network administrators of all sites must coordinate their efforts and determine if each site is fulfilling the requirement for uniqueness. This must be done before implementation begins, ideally as part of the information-gathering phase of the implementation process.

Unique numbers

Most of the information that must be unique is numerical. In a messaging network, unique numbers have a particular definition.

A unique number is one that does not conflict with another number. Conflict occurs when there is an exact or a partial match when compared from left to right.

A number is unique when it does not repeat any consecutive digits when read from left to right.

Example

- 6338 conflicts with 6338, 633, 63, and 6.
- If you use 6338 and require a unique number, you must use one that is unique from left to right; for example, 7338 is unique.

Specify time periods

Introduction

When you implement CallPilot networking solutions, you set several parameters that are expressed as periods of time.

24-hour clock

CallPilot uses a 24-hour clock. Therefore, 3:00 p.m. is expressed as 15:00.

Guidelines

Use the following guidelines to specify time periods:

- The last minute of any end time is removed.
  - 08:00–08:00 is actually 08:00–07:59
- Overlaps are affected by this removal.
  - There is no overlap for the following:
    08:00–10:00 and 10:00–17:00
  - There is a one-minute overlap for the following:
    08:00–10:00 and 09:59–17:00

Modifying the display

The time display can be modified. To make modifications, use the Control Panel settings.

The default time display is HH:MM.

Real-time displays, such as start times and stop times, can be modified to HH:MM:SS.

Coordination among sites

In this section

Coordinating efforts to create a messaging network

Introduction

A messaging network consists of connected sites. Each site has its own network database that contains information about itself and about every remote site with which it communicates.

To gather the needed information requires considerable coordination among the network administrators.

If a network administrator makes changes to the configuration of one site, often these changes must be communicated to the network administrators of all other sites. The changes must be reflected in the messaging databases of all other sites.

Site

A site in a messaging network consists of two parts:

- a messaging server—the computer on which CallPilot resides
- a prime switch location—the switch that is directly attached to the messaging server

NMS sites

An NMS site consists of

- a messaging server
- a prime switch location
- all satellite switch locations

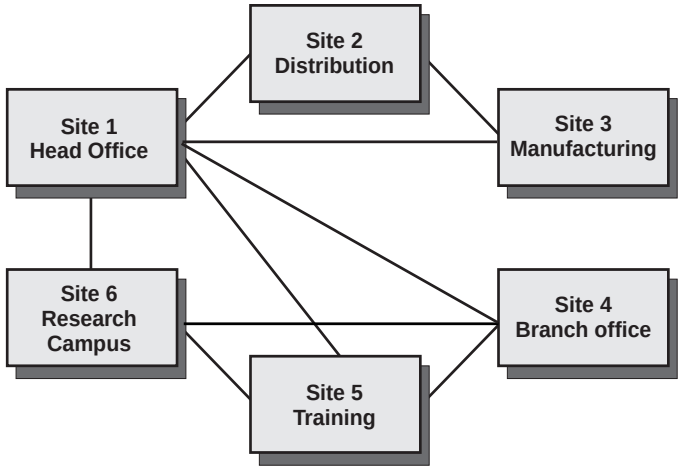
Protocol agreement

Every site in a messaging network can have one or more networking solutions installed. However, only one protocol can be used between any two sites. Therefore, there must be agreement with every site with which your local site exchanges messages on the protocol used.

Example

In the following diagram, every site has VPIM Networking implemented.

This means that Site 1, the Head Office, can exchange VPIM messages with every site in the messaging network. Sites 2 and 3 also have Enterprise Networking implemented. These sites can exchange messages using Enterprise Networking. Site 2 and Site 3 cannot use Enterprise Networking to exchange messages with any other site.



G101147.eps

Note that Site 2 and Site 3 have the potential to exchange messages using VPIM Networking, because both sites have this networking solution implemented. However, only one protocol can be used between any two sites.

Basic agreements

One of the challenges of setting up a messaging network is coordinating the efforts of the networking administrators of all the sites. This coordination is critical for ensuring that there are no conflicts or overlap.

Several agreements must be made among the network administrators. For example, each site must agree with every other site about what protocol it will use to communicate. Also, if Enterprise Networking is installed at any site in the messaging network, all sites must have a unique Enterprise site ID number.

This type of coordination should be complete before you begin to implement networking at your site. Gather information and analyze it to ensure that there are no conflicts or oversights. Much of the information that you gather can be captured on a messaging network representation.

For more information on creating a messaging network representation, see Create a messaging network representation on page 192.

Network database

The concept of a network database is integral to understanding how to implement a networking solution.

Each site in a messaging network has a network database. The database contains information about the local site and all remote sites that the local site communicates with.

If a remote site is contained within a network database, it is considered integrated. If a remote site is not included in a network database, it is considered open.

Information in the network database

Coordination of effort is required when you implement networking at your site because you are entering not only information about your site, but also information about all other sites in the messaging network into your network database.

Every site in a messaging network has its own network database. The network database contains all information entered during the implementation and configuration of networking at the site.

The network database contains three main types of information:

- information about each of the networking solutions installed at a site
- information about the local site
- information about every remote site in the messaging network with which the local site communicates

The information you enter into your network database for each remote site must be provided by the network administrator at that site. Much of the information that you enter for a remote site is the same information the site entered about itself locally.

All remote sites may not be in a network database

The local network database contains information about the remote sites with which the local site exchanges messages. These sites appear in the Messaging Network Configuration tree view.

If the messaging network is a true mesh network, your network database contains information about every site. However, if the messaging network is a non-mesh network, the database does not contain the sites with which the local site does not exchange messages.

This can be important when implementing networking solutions, because there are some boxes that must be unique not just in the network database, but throughout the messaging network. The validation process can only check against information in the local networking database. Validation against sites not in the network database must be done manually.

Network databases are cooperative

One of the most important implications of the CallPilot network database system is the interdependence of the databases.

Although each site has its own network database, the information in one must be consistent with the information contained in another. If one network database is changed, all other databases must also be changed.

Therefore, network administrators must coordinate their efforts before making modifications. If changes are made to one network database but not to the other network databases, the messages exchanged with the site that changed its network database will result in non-delivery notifications.

Information that must be coordinated

The following information must be coordinated among all network administrators before any site in the messaging network can be implemented:

- name of local messaging server
- Enterprise site ID, for all sites that require one
- dialing plan for dialing to each site
- dialing plan information:
  - ESN location codes
  - CDP steering codes
  - SMTP/VPIM network shortcuts

When this information is added to the messaging network representation, check it carefully to ensure that each element is unique.

Open and integrated sites

Introduction

The difference between open and integrated sites is one of the fundamental concepts in a messaging network.

A messaging network is made up of integrated sites. A site is considered integrated when it is included in the network databases of the other sites in the messaging network.

However, a site can send messages to and receive messages from sites that are not part of the messaging network. These sites are known as open sites. A typical open site might be a major customer or supplier to your company.

Use of protocols

This capacity to send and receive messages from open sites is achieved by using industry-standard protocols, such as AMIS and VPIM. As long as the messaging system at an open site complies with either protocol, sites in the messaging network can communicate with the open site.

Implicit open sites

In addition to open and integrated sites, VPIM Networking uses the concept of implicit open sites.

VPIM Networking can be used in an integrated messaging network. Shortcuts for the addresses of the remote sites that you want to communicate with using VPIM Networking are listed in your network database. These shortcuts enable users to address their messages using the telephone, because the shortcuts map to the address of the remote site.

Channels and networking

Introduction

To process a call, every analog networking solution requires access to a channel. A channel provides a connection between the switch and the Digital Signal Processor (DSP) cards on the Meridian Application Server.

CallPilot supports three channel types, each corresponding to different media:

- voice
- fax
- speech recognition

Although a networking solution can work with all three types of channels, voice ports are usually used.

Minimum and maximum channels

The channel requirements for a networking solution are expressed as a minimum and maximum range.

Coordination

Coordinate with the system administrator to determine how the channel requirements are set. The system administrator must know about the networking solutions that are implemented and the anticipated traffic before setting up the channels. This ensures that when a networking solution is implemented, the necessary channel resources are available.

Voice channels

If channels are dedicated to networking, the number of channels required for networking must be identified. However, the number required also depends on the traffic requirements of other CallPilot features.

For significant amounts of analog networking traffic and for NMS, additional voice channels may be required.

The table below shows how many networking calls are processed each hour for a specific number of channels. The table is based on the following assumptions:

- Five percent of the recipients of composed messages are at remote sites.
- The message length is 40 seconds.
- The network consists of three sites.

Number of channels	Networking channels	Number of networking calls
72	2	102
96	3	153

NMS and channels

NMS does not require channels to transmit messages. Calls between switches in an NMS network are routed to the CallPilot server over ISDN PRI links.

However, a calculation of the system size must consider all users, even if they are attached to NMS users on satellite switches.

Types of channels required

Networking requires full-service voice channels. Networking does not work on basic-service voice channels.

If full-service multimedia channels are also available, they are used by networking only if

- full-service multimedia channels are configured
- both full-service voice channels and full-service multimedia channels are configured, and all voice channels are out of service

VPIM considerations

When VPIM Networking is installed, the CallPilot server must be attached to the Customer LAN (CLAN). Usually, this connection is already in place.

Networking and security

In this section

Overview

Introduction

It is important to maintain the integrity and security of your CallPilot system.

Every site in your messaging network should follow the recommended security precautions. In addition to these general security precautions, there are some precautions specific to a messaging network. These specific precautions are described in this section.

ATTENTION!

The information presented in this section is intended for general information only and should not be considered exhaustive. Consult a security specialist for more information.

AMIS Networking and security

Introduction

With AMIS Networking, local users can dial out to the public network. This means that the messaging network is susceptible to toll fraud. You must take precautions to ensure that the network is not exploited at your company's expense.

All AMIS Networking messages sent to sites that are not part of your private messaging network will appear on the telephone bill for your site.

Long-distance toll charge features

Several features minimize the likelihood of long-distance toll fraud from an AMIS Networking site:

- CallPilot feature
  - Restriction/Permission Lists (RPLs)
- switch features, such as
  - Trunk Group Access Restrictions (TGARs)
  - Class of Service (CLS)
  - Network Class of Service (NCOS)

Further information

For a general overview of security features, consult the relevant section in the *Advanced Administration Guide*.

For a detailed discussion of how you can use RPLs to secure an AMIS Networking site, consult the relevant section in the *AMIS Networking Implementation and Administration Guide*.

For an overview of how switch features can be used to secure an Open AMIS Networking site, consult the security section in the *Advanced Administration Guide*.

For a detailed discussion of switch security features, consult your switch documentation.

VPIM Networking and security

Introduction

There are special security considerations if VPIM Networking is used to send messages over the Internet.

VPIM Networking connects sites with links created over the Internet. Basically, network connections are created over the public Internet rather than over private leased lines or public packet-switched networks.

Such Internet-based virtual private networks (VPNs) require security. The internal network can be reached by any Internet user unless security devices, such as routers and firewalls, are in place.

Firewalls

It is not possible to give specific recommendations for setting up a firewall. Many configurations are possible.

Note: It is strongly recommended that you use a router to create a subnet for the CallPilot system to separate it from the larger data network.

Encryption

Encryption enables you to protect the integrity of messages sent over the Internet.

If you must transmit messages that contain information important to your business, encryption may be required. Information that may need to be secure includes

- financial data
- proprietary information, such as product development information
- confidential personnel information

VPIM Networking and Meridian Mail Net Gateway

Meridian Mail Net Gateway supports the Entrust security package, which encrypts messages sent between Net Gateway sites. However, CallPilot does not support Entrust.

Therefore, if Meridian Net Gateway sites are part of your messaging network, Entrust cannot be used.

You do not have to disable the Entrust encryption used at a Net Gateway site, because Net Gateway will not encrypt any message intended for a non-Net Gateway site.

VPIM Networking and Windows NT

Windows NT includes its own encryption feature. If you want to use the Windows NT encryption feature with VPIM Networking, you must thoroughly test how this feature works.

Malicious attacks

Hackers use several types of attacks against sites that are connected to the Internet.

Some of the most common malicious attacks include

- service attacks
- e-mail flooding
- spamming

Service attacks

Service attacks are intended to bring down a data network. A service attack is designed to keep a data network continuously occupied so that it cannot perform its usual tasks.

Ping attacks

One of the most common types of service attacks is the continuous use of the Packet Internet Groper (ping) utility.

The ping program is an echo utility that tests continuity and path delay. Pinging is used to determine if a remote site is reachable and is an invaluable tool for testing your system.

However, the process of pinging uses system resources. If continually pinged, the system is unable to provide other services. Although it is illegal to do so in many countries, hackers have created programs that ping a server continually until the system is brought down.

Security against ping attacks

Ping attacks can be deflected by using packet filters. A packet filter examines the TCP/IP header of each incoming message and rejects all those that are specified as not allowed or restricted. The list of rejected headers is maintained in a filter table. The ping protocol, which usually uses port 7, is usually allowed but restricted.

Setting up filter tables is complicated. The syntax and format used by each vendor’s router is different.

Work with your data network administrator to set up the necessary defenses against service attacks.

Switch security and networking

Introduction

The switch location is already set up and configured when you begin to implement a networking solution. Several switch security features have already been set. These must be considered when implementing a networking solution.

Switch security must be tight enough that restricted activity is not allowed, but not so tight that networking messages that should be allowed are restricted.

Switch security features

The following switch security features may affect the exchange of networking messages:

- Restriction Permission Lists (RPLs)
- ACD agent restrictions
  - Trunk Group Access Restrictions (TGARs)
  - Class of Service (CLS)
  - Network Class of Service (NCOS)

These features offer multiple layers of defense against fraud and other system abuses. However, if these features are set without considering the needs of networking, they may also block legitimate messages from reaching their destinations.

ATTENTION!

It is strongly recommended that you review the switch security settings with the switch technician before you begin to implement a networking solution. Compare the networking needs with the current security settings, and ensure that necessary changes are made.

See also

This description is intended only as an overview. For more detailed information about switch security features and how they must be set, consult your switch documentation and the relevant sections in the *Advanced Administration Guide*.

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CallPilot

Networking Planning Guide

Information is subject to change without notice. Nortel Networks reserves the right to make changes in design or components as progress in engineering and manufacturing may warrant.

The process of transmitting data and call messaging between the CallPilot server and the switch or system is proprietary to Nortel Networks. Any other use of the data and the transmission process is a violation of the user license unless specifically authorized in writing by Nortel Networks prior to such use. Violations of the license by alternative usage of any portion of this process or the related hardware constitutes grounds for an immediate termination of the license and Nortel Networks reserves the right to seek all allowable remedies for such breach.

Publication number:	555-7101-100
Product release:	2.5
Document release:	Standard 1.0
Date:	October 2003

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