555-7101-101

CallPilot

Planning and Engineering Guide

Product release 1.07 Standard 2.0 November 2000

NORTEL NETWORKS™

P0916384

CallPilot

Planning and Engineering Guide

Publication number:	555-7101-101
Product release:	1.07
Document release:	Standard 2.0
Date:	November 2000

Copyright © 2000 Nortel Networks, All Rights Reserved

Printed in the United States of America

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 Meridian 1 and CallPilot 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.

This page and the following page are considered the title page, and contain Nortel Networks and third-party trademarks

*Nortel Networks, the Nortel Networks logo, the Globemark, and Unified Networks, BNR, CallPilot, DMS, DMS-100, DMS-250, DMS-MTX, DMS-SCP, DPN, Dualmode, Helmsman, IVR, MAP, Meridian, Meridian 1, Meridian Link, Meridian Mail, Norstar, SL-1, SL-100, Supernode, Symposium, Telesis, and Unity are trademarks of Nortel Networks.

ACCENT is a trademark of Accent Software International Ltd.

ACTION REQUEST SYSTEM and AR SYSTEM are trademarks of Remedy Corporation.

AMDEK is a trademark of Amdek Corporation.

ANSI is a trademark of the American National Standards Institute, Inc.

AT&T is a trademark of American Telephone and Telegraph Corporation.

ATRIA is a trademark of Pure Atria Corporation.

CASEWARE is a trademark of Caseware International, Inc.

CLEARCASE is a trademark of Rational Software Corporation.

CONTINUUS is a trademark of Continuus Software Corporation.

CRYSTAL REPORTS is a trademark of Seagate Software Inc.

EUDORA PRO is a trademark of QUALCOMM Inc.

FRAME, FRAMEBUILDER, FRAMEMAKER, and POSTSCRIPT are trademarks of Adobe Systems Incorporated.

HELVETICA is a trademark of Eltra Corporation.

HITACHI is a trademark of Hitachi Limited.

LOGITECH is a trademark of Logitech, Inc.

MACINTOSH and APPLE are trademarks of Apple Computer Inc.

MFA is a trademark of Astec International Ltd.

MICROSOFT, MS-DOS, POWERPOINT, WINDOWS, and WINDOWS NT are trademarks of Microsoft Corporation.

NOVELL is a trademark of Novell, Inc.

PCANYWHERE is a trademark of Symantec Corporation.

PROMARK and RHOBOT are trademarks of DMI Promark, Inc.

SLR4, SLR5, and TANDBERG are trademarks of Tandberg Data ASA.

SONY is a trademark of Sony Corporation.

SYBASE is a trademark of Sybase, Inc.

TIMES is a trademark of Heidelberger Druckmaschinen Aktiengesellschaft.

3COM is a trademark of 3Com Corporation.

UNIX is a trademark of X/Open Company Limited.

WINRUNNER is a trademark of Mercury Interactive Corporation.

Publication history

November 2000	The *CallPilot Planning and Engineering Guide* is released as Standard 2.0. This version documents Release 1.07 of CallPilot planning and engineering information. This edition makes all previous editions obsolete.
May 2000	The *CallPilot Planning and Engineering Guide* is released as Standard 1.0. This version documents Release 1.07 of CallPilot planning and engineering information. This edition makes all previous editions obsolete.

Contents

1 Getting started with planning and engineering 11

Section A: About this guide 13
Overview 14
What's new in Release 1.07?. 15
Skills you need. 16

Section B: About planning and engineering 19
Defining planning and engineering 20
Components in a CallPilot system. 21
Related information products 23

2 System configurations 27
Overview 28

Section A: About system configurations 31
Understanding the tower and rackmount platforms 32
Understanding the 200i IPE platform 36
Understanding the 201i IPE platform 38

Section B: Hardware and software configurations 41
CallPilot server 42
Switches. 45
Administrative PC 49
Web Messaging server. 52
Desktop Messaging clients 55

Section C: Connectivity requirements 59
Meridian 1 60
MSL-100/DMS-100. 63
Lucent, Mitel, or Rolm 65
Matra 66
Customer LAN 67

3 Learning about CallPilot features 71
Overview 72

Application Builder. 74
Reporter 76
Desktop and Web Messaging 77
Networking 78
Multimedia messaging 81

4 Determining system size 83
Overview. 85

Section A: About channel requirements 87
An overview of channels 88
Guidelines for determining channel requirements 90

Section B: Determining voice channel requirements 93
Steps to follow in determining the number of voice channels 94
To help you determine voice channel requirements 96
Determining the busy hour activity 98
Determining the activity of all voice services 99
Determining network activity 100
Determining Outcalling activity 101
Determining the number of voice channels required 102

Section C: Determining fax channel requirements 105
An overview of fax channels 106
Determining the number of fax channels 107
To help you determine fax channel requirements. 109
Determining the busy hour fax menu activity 111
Determining the busy hour traffic for fax callback activity 113
Determining the busy hour traffic for fax auto attendant 114
Determining the busy hour fax messaging activity 116
Calculating the number of fax channels required 117
Calculating the number of fax channels for fax broadcasting activity 118

Section D: Determining speech-recognition channel requirements 121
Determining the number of speech-recognition channels required 122

Section E: Determining the number of MPUs required 125
Calculating the number of MPUs required 126

Section F: Determining storage hour requirements 129
Steps to follow in estimating your storage hours 130
To help you determine storage hour requirements 131
Determining the mailbox storage requirements 133

Calculating storage hours for Application Builder 136

Section G: Calculating system size 139
Before you calculate your system size 140
Calculating your system size 141

5 Engineering the server 143
Understanding the 200i server capacities 144
Understanding the 201i server capacities 146
Understanding the 702t server capacities 149
Understanding the 1001rp server capacities 152

6 Engineering the clients 155
Overview 156

Section A: Engineering the administrative PC 157
System requirements for Reporter 158
System requirements for Application Builder 160

Section B: Engineering the desktop client 161
System requirements for the desktop client 162

Section C: Calculating disk space requirements 165
To help you determine disk space requirements 166

7 Selecting a site 173
Overview 174
Understanding space requirements for the CallPilot server 175
CallPilot power supply requirements 178
Environmental specifications for the CallPilot servers 180

A Traffic capacity tables 185
Types of traffic capacity tables 186
CCS values and channel requirements table 187

B Planning spares requirements 193
Planning spares for the CallPilot servers 194
200i server spares 195
201i server spares 197
702t server spares 200

1001rp server spares 204
Switch connectivity spares (tower and rackmount platforms) 208
IPE distributor support kits 210

C Component list 211

D Site survey checklist 213
Planning your CallPilot system using a site survey checklist. 214

Index 219

Chapter 1

Getting started with planning and engineering

In this chapter

Section A: About this guide **13**

Overview 14

What's new in Release 1.07? 15

Skills you need 16

Section B: About planning and engineering **19**

Defining planning and engineering 20

Components in a CallPilot system 21

Related information products 23

Section A: About this guide

In this section

Overview 14
What's new in Release 1.07? 15
Skills you need 16

Overview

Introduction

The *CallPilot Planning and Engineering Guide* provides descriptive information and instructions for selecting and planning your CallPilot system.

Before you can start planning, you must understand the key components that need to be provisioned and how these components interact with one another. This chapter provides a high-level overview of these concepts.

Skills you need

Skills that might be helpful when planning your CallPilot system include the following:

- knowledge about Nortel Networks products
- knowledge about non-Nortel Networks switches
- Windows operating systems
- network management and client-server systems

See page 16 for more details.

Other resources

To ensure a successful implementation, you should use both this guide and the resources identified on page 17.

What's new in Release 1.07?

Introduction

CallPilot now supports the following switches:

- MSL-100
- DMS-100 (Centrex)
- Matra (not available in North America)
- Lucent
- Mitel
- Rolm

The 201i platform replaces the 200i platform.

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 is helpful:

- Meridian 1
- MSL-100/DMS-100
- Meridian Mail
- CallPilot 1.06

Experience or knowledge of non-Nortel Networks switches

Knowledge of, or experience with, the following non-Nortel Networks switches is helpful:

- Matra
- Lucent
- Mitel
- Rolm

PC experience or knowledge

Knowledge of, or experience with, the following PC products is helpful:

- Microsoft Windows NT
- Microsoft Windows 95
- Microsoft Windows 98
- Microsoft Windows 2000

Other experience or knowledge

Other types of experience or knowledge that might be useful include

- network management
- client-server systems
- flowcharting

Other resources

The following documents and tools might be useful in engineering a CallPilot system:

- CallPilot 1.07 General Release Bulletin
- Meridian Client Compatibility Check utility
- Meridian Mail comparison
- Product Bulletins
- CallPilot Engineering Spreadsheet

To obtain the above resources, contact your Nortel Networks distributor. If you are a Nortel Networks distributor, you can obtain these documents from the CallPilot area of the Nortel Networks Information Center web site at http://www.nortel.com/partnercenter.

Section B: About planning and engineering

In this section

Defining planning and engineering 20
Components in a CallPilot system 21
Related information products 23

Defining planning and engineering

Introduction

The process of planning and engineering involves determining the best size, platform, and location for your CallPilot system. Worksheets and checklists are provided throughout this guide to help you with this task.

As a framework for beginning your planning and engineering activities, some possible questions to consider are listed below.

Questions to consider

Consider these questions:

- Have you identified administrative PCs?
- Where will you locate the administrative PCs? What is the LAN connectivity for the PCs?
- Which of the three CallPilot servers will you use?
- Where will you locate the servers and how will you connect them?

Contents of this guide (including checklists and worksheets) can help you to find answers to these questions.

Components in a CallPilot system

Introduction

A CallPilot system consists of three key components: switch, server, and administrative PC. Desktop Messaging is an option that can be installed on desktop PCs. For Web Messaging, a web server is another optional component (supplied by the customer) that allows desktop PCs to access messages via web pages.

Switch types

Switch types that are compatible with CallPilot include models of these switch families: Meridian 1, MSL-100, Matra, Lucent, Mitel, and Rolm. Complete compatibility details are outlined later in this guide.

Server types and connection methods

The server can be a tower (702t), rackmount (1001rp), or an IPE (200i or 201i) platform. Based on the switch, the server connects using one of the following connectivity means:

- Meridian 1: Embedded LAN (ELAN) and IPE network loop through the MGate card
- MSL-100/DMS-100: T1 and SMDI link
- Lucent, Mitel, and Rolm: Digital Set Emulation (DSE)
- Matra: analog link

Administrative and desktop PCs

The administrative PC maintains the server, switch, and CallPilot software.

The desktop PC with Desktop Messaging can download messages from the CallPilot server. A web server allows desktop users to access messages using a web browser.

What needs to be provisioned?

The following components must be provisioned:

- CallPilot server
- administrative PC
- switch resources related to CallPilot
- desktop client PC, if the Desktop Messaging feature is required
- web server, if Web Messaging is required

Related information products

Introduction

The following CallPilot technical documents are stored on the CD-ROM that you receive with your system. You can search the entire suite of documentation online, or you can print part or all of a guide.

Planning and engineering guides

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

Document titles
Planning and Engineering Guide
Meridian Mail to CallPilot Migration Utility Guide

Installation and configuration guides

These guides describe how to install hardware and software for the CallPilot server, client, and desktop messaging. Instructions for configuring the switch are also provided.

Document titles
200i Installation and Configuration Guide
201i Installation and Configuration Guide
702t Installation and Configuration Guide
1001rp Installation and Configuration Guide
Desktop Messaging Software Installation and Maintenance Guide

Administration guides

These guides provide specialized information to help you configure CallPilot, administer and maintain it, and use its features.

Document titles
Getting Started Quick Reference Card
Administrator's Guide
Reporter Guide
Application Builder Guide
Monitoring and Security for the Administrator

Networking guides

These guides describe how to plan, install, set up, and troubleshoot networking services.

Document titles
Network Planning Guide
AMIS Implementation and Administration Guide
Integrated AMIS Implementation and Administration Guide
NMS Implementation and Administration Guide
Enterprise Implementation and Administration Guide
VPIM Implementation and Administration Guide

End user guides

These guides are intended for end users of CallPilot, such as phoneset users and desktop messaging users.

Document titles
Multimedia Messaging User Guide
Speech Activated Messaging User Guide
Desktop Messaging Quick Reference Guide

Troubleshooting reference

This reference provides step-by-step troubleshooting procedures for CallPilot.

Document title
CallPilot Troubleshooting Reference

Using the online Help, guides, and tutorials

CallPilot contains three online sources for information:

- Online Help provides brief answers to the questions “What’s this?” and “How do I...?”
- Online guides provide detailed conceptual information, as well as information on how to perform detailed tasks.
- Online tutorials provide a complete product overview, as well as specific information on how to use Application Builder.

You can access all information using either the Help menu or Help buttons.

Contacting technical support

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

Contacting Nortel Networks

If you have comments or suggestions for improving CallPilot and its documentation, contact Nortel Networks at the following web site address:

http://www.nortelnetworks.com/callpilot_feedback

Chapter 2

System configurations

In this chapter

Overview 28

Section A: About system configurations 31

Understanding the tower and rackmount platforms 32

Understanding the 200i IPE platform 36

Understanding the 201i IPE platform 38

Section B: Hardware and software configurations 41

CallPilot server 42

Switches 45

Administrative PC 49

Web Messaging server 52

Desktop Messaging clients 55

Section C: Connectivity requirements 59

Meridian 1 60

MSL-100/DMS-100 63

Lucent, Mitel, or Rolm 65

Matra 66

Customer LAN 67

Overview

Introduction

This chapter provides an overview of the four system configurations supported by CallPilot.

Its purpose is to assist you in understanding the system, and the hardware and software components that must be provisioned.

Supported server platforms

You can install CallPilot software on a tower (702t) or rackmount (1001rp) platform. The tower platform can connect to any of the supported switches. The rackmount platform can connect to any of the supported switches except Matra.

You can also install the CallPilot software on a server (200i or 201i) that resides in the Intelligent Peripheral Equipment (IPE) shelf on a Meridian 1 switch.

Supported switches

Based on the server you choose, CallPilot supports the following switches:

- Meridian 1
- MSL-100
- DMS-100 (Centrex)
- Lucent
- Matra (not available in North America)
- Mitel
- Rolm

For information about the hardware and software requirements, see page 45. For information about the connectivity requirements, see Section C: “Connectivity requirements” on page 59.

Administrative PC

CallPilot features, such as Reporter and Application Builder, are intended to run on the administrative PC. The administrative PC should be connected to the ELAN to administer the switch and the CallPilot server.

For more details, see page 49.

Web Messaging server

If you are using the CallPilot Web Messaging feature, you need a Microsoft Internet Information Server (IIS) web server. For information about the minimum configuration requirements, see page 52.

Desktop Messaging client

A PC running Windows 95, Windows 98, Windows 2000, or Windows NT can run the Desktop Messaging client that is available with CallPilot. The following Desktop Messaging clients are supported by CallPilot:

- Desktop Messaging for Microsoft Exchange/Outlook
- Desktop Messaging for Lotus Notes
- Desktop Messaging for Internet Mail clients
- Desktop Messaging for Novell GroupWise
- Desktop Messaging for Web Browsers

For information about the minimum configuration requirements, see page 55.

Section A: About system configurations

In this section

Understanding the tower and rackmount platforms 32
Understanding the 200i IPE platform 36
Understanding the 201i IPE platform 38

Understanding the tower and rackmount platforms

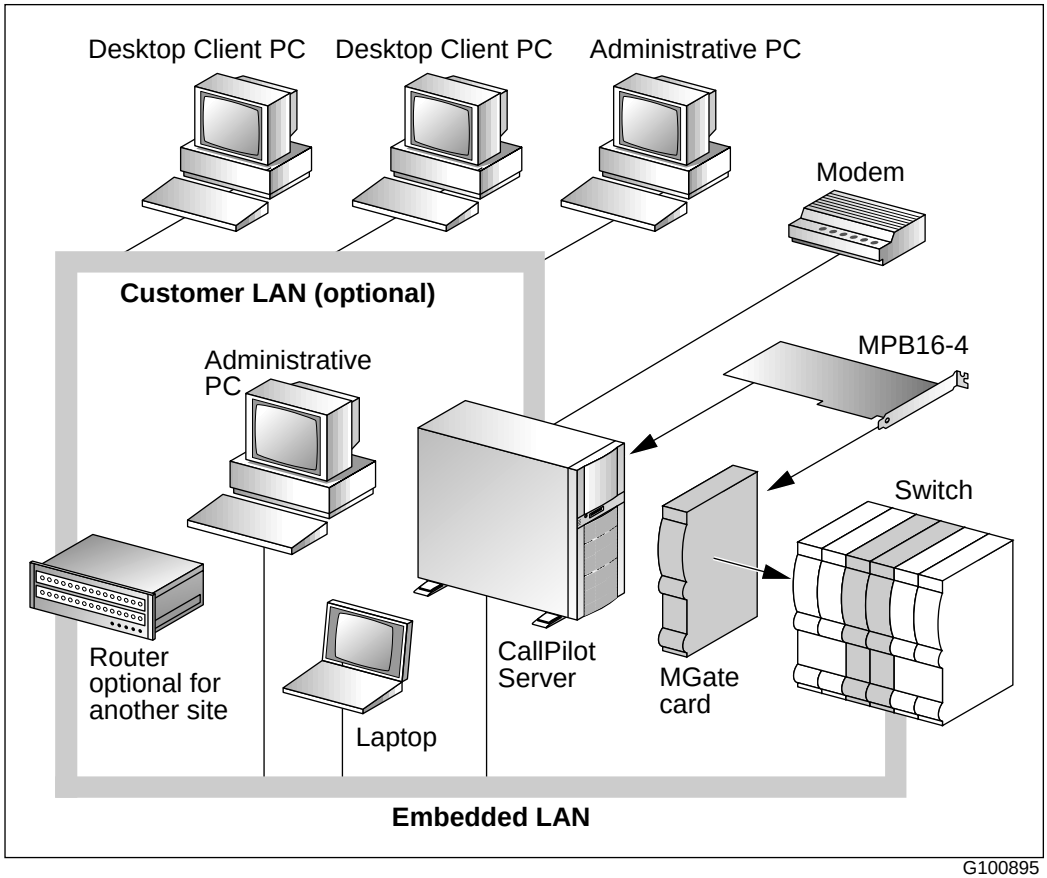
Introduction

You can install CallPilot software on a tower (702t) or rackmount (1001rp) platform. This section explains both of these configurations.

The tower and rackmount platforms support up to 96 DS0 channels and 96 Multimedia Processing Units (MPUs), and provide up to 1000 hours of storage.

Network diagram

The tower and rackmount platforms have similar components but differ in server hardware. The following diagram shows a typical network setup using the tower platform and Meridian 1 switch. You can use a similar setup for a rackmount server. The ELAN is not supported by non-Meridian 1 switches.


Desktop Client PC
Desktop Client PC
Administrative PC
Modem
Customer LAN (optional)
Administrative PC
MPB16-4
Switch
Router optional for another site
CallPilot Server
MGate card
Laptop
Embedded LAN
G100895

Switch

The tower or rackmount platform includes support for the switches identified in the following table:

Server type	Switch components	For more details, see
Tower (702t)	■ Meridian 1	■ page 60
	■ MSL-100 or DMS-100 (Centrex)	■ page 63
	■ Lucent	■ page 65
	■ Matra	■ page 66
	■ Mitel	■ page 65
	■ Rolm	■ page 65
Rackmount (1001rp)	■ Meridian 1	■ page 60
	■ MSL-100 or DMS-100 (Centrex)	■ page 63
	■ Lucent	■ page 65
	■ Mitel	■ page 65
	■ Rolm	■ page 65

Server and network connectivity

The server in the tower or rackmount configuration includes

- the CallPilot server (specifically the 702t or 1001rp) loaded with Windows NT Server 4.0, pcANYWHERE32 version 8, and an SQL Anywhere database

  Nortel Networks provides the server.
- modem (optional, for support purposes)
- Customer LAN (optional)
- laptop (for installation and maintenance purposes if no administrative PC is present at the customer site)

Based on the switch configuration, you require the following connectivity hardware for the CallPilot server:

Switch type	Connectivity equipment
Meridian 1	Hub, ELAN, MPB-16 Carrier Board, and MGate card
MSL-100 or DMS-100	SMDI Serial RS-232C line and Dialogic dual-span T1 card
Matra	MPB16-2T
Lucent, Mitel, or Rolm	VTG VoiceBridge 2000

Note: Never connect a printer to the server.

Client PCs

The client PCs include

- one web server PC
- one or more administrative PCs loaded with Windows 95, Windows 98, Windows 2000, or Windows NT Workstation 4.0
- one or more desktop client PCs loaded with third-party e-mail software packages (if the Desktop or Web Messaging software is purchased)

The customer supplies all client PCs.

Understanding the 200i IPE platform

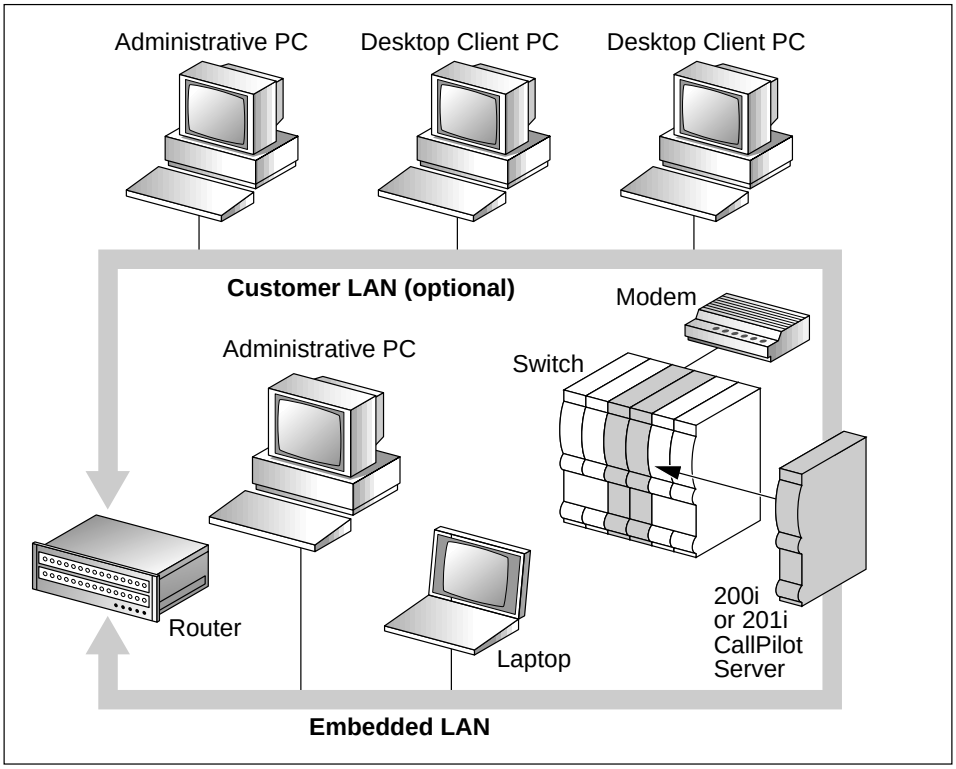
Introduction

You can install CallPilot on an IPE platform (200i) that resides in a Meridian 1 or Option 11C switch. This section provides an overview of this configuration.

The IPE platform supports up to 24 DS0 channels and 24 MPUs, and provides 200 hours of storage.

Network diagram

The following diagram shows a typical network setup with the 200i platform:



Switch

Only the Meridian 1 switch is supported. For more details, see page 60.

Server

The server component in the 200i configuration includes

- the 200i server loaded with Windows NT Server 4.0, pcANYWHERE32 version 8, and an SQL Anywhere database

  Nortel Networks provides the server.
- MPC-8 cards, which are part of the CallPilot server
- modem (for support purposes)
- ELAN
- customer LAN (CLAN, optional)
- Ethernet hub
- laptop (for installation and maintenance purposes, if no administrative PC is present at the customer site)

Client PCs

The client PCs include

- one or more administrative PCs loaded with Windows 95, Windows 98, Windows 2000, or Windows NT Workstation 4.0
- one or more desktop client PCs loaded with third-party e-mail software packages

  You require these machines if Desktop Messaging software is purchased.

The customer supplies all client PCs.

Understanding the 201i IPE platform

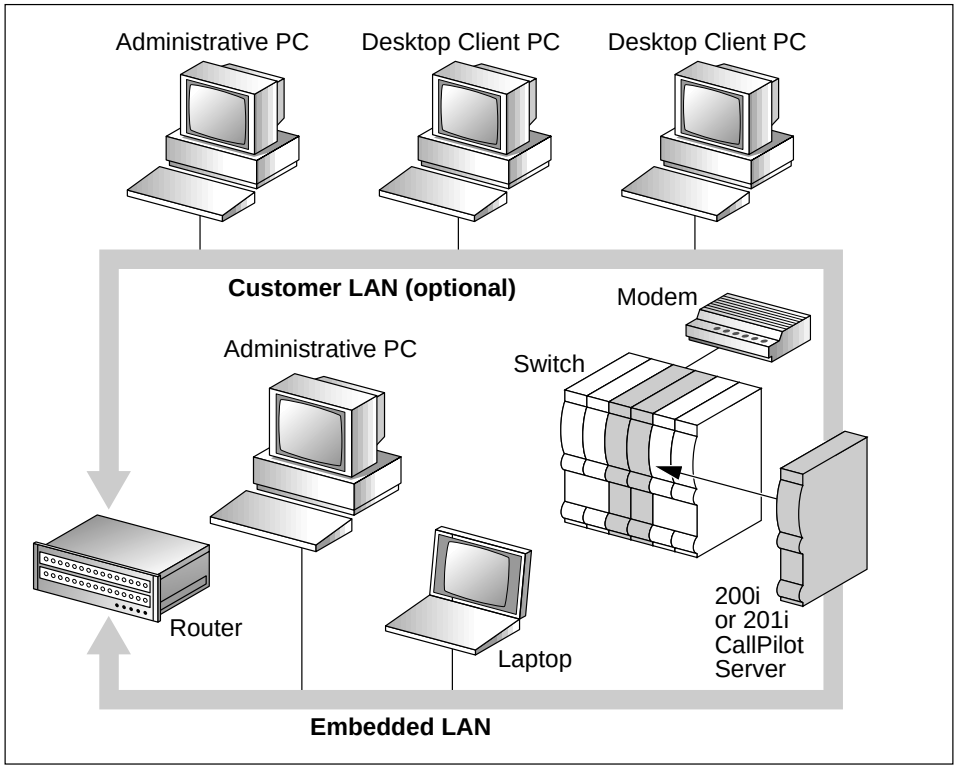
Introduction

You can install CallPilot on an IPE platform (201i) that resides in a Meridian 1 or Option 11C switch. This section provides an overview of this configuration.

The IPE platform supports up to 24 DS0 channels and comes standard with 24 MPUs, and provides 200 hours of storage.

Network diagram

The following diagram shows a typical network setup with the 201i platform:



Switch

Only the Meridian 1 switch is supported. For more details, see page 60.

Server

The server component in the 201i configuration includes

- the 201i server loaded with Windows NT Server 4.0, pcANYWHERE32 version 8, and an SQL Anywhere database

  Nortel Networks provides the server.
- MPC-8 cards, which are part of the CallPilot server
- modem (for support purposes)
- ELAN
- customer LAN (CLAN, optional)
- Ethernet hub
- laptop (for installation and maintenance purposes, if no administrative PC is present at the customer site)

Client PCs

The client PCs include

- one or more administrative PCs loaded with Windows 95, Windows 98, Windows 2000, or Windows NT Workstation 4.0
- one or more desktop client PCs loaded with third-party e-mail software packages (if Desktop Messaging software is purchased)

The customer supplies all client PCs.

Section B: Hardware and software configurations

In this section

CallPilot server 42
Switches 45
Administrative PC 49
Web Messaging server 52
Desktop Messaging clients 55

CallPilot server

Introduction

This section summarizes the hardware and software requirements for the CallPilot server.

Hardware

CallPilot is an application built on the CallPilot server hardware platform. The CallPilot platform for Release 1.07 consists of a tower chassis (702t), rackmount chassis (1001rp), or a server that fits into the IPE shelf of a Meridian 1 switch (200i or 201i). You can connect the 702t platform to any of the supported switches. You can connect the 1001rp platform to any of the supported switches except Matra.

Software

The software configuration consists of the following items:

- the server operating system

  The CallPilot server uses the Windows NT Server 4.0 operating system with Service Pack 5.
- CallPilot software
- third-party software

Compatibility with other products and environments

Meridian Mail

CallPilot can coexist with Meridian Mail on the Meridian 1 switch. You can network CallPilot with Meridian Mail systems that use one or more of the following network protocols:

- AMIS-Analog Networking
- Enterprise Networking
- VPIM Networking using Meridian Mail Net Gateway

However, there are limitations. See page 80 for details.

Meridian 1 Multi-Tenant

CallPilot supports users on a multi-tenant Meridian 1 switch as if they were on a single-tenant system. CallPilot

- does not know to which Meridian 1 tenant a user belongs
- has no administration or billing features by tenant

Custom Controlled Routing

CallPilot can coexist on the same Meridian 1 switch as Custom Controlled Routing (CCR).

CallPilot does not support the CCR command, Give IVR.

Symposium applications

CallPilot can coexist with Symposium Call Center Server 1.x and Symposium Express 1.0 or 2.0 on the same Meridian 1 switch and ELAN.

CallPilot does not support the following Symposium Call Center Server voice processing elements commands:

- Give IVR
- Give Broadcast Announcement
- Collect Digits
- Play Prompt
- Open…End Voice Session

Refer to Product Bulletin 99115 for details.

Internet Telephony Gateway

AMIS-Analog and Enterprise Networking are supported with Internet Telephony Gateway (ITG) 1.1 (version 1.0.34 or later).

Network Message Service is not supported by ITG 1.1.

Third-party Windows NT Server software and hardware

Nortel Networks does not support the addition of any third-party Windows NT Server software or hardware to the CallPilot server. Installation of third-party Windows NT Server software or hardware can destabilize the system, degrade its mission of providing real-time call processing performance, and disrupt its Year 2000 (Y2K) conformance. For details, refer to Product Bulletin 99067, “CallPilot Unauthorized Hardware and Software.”

See also

For detailed information on the capacity of the servers, refer to Chapter 5, “Engineering the server.”

Switches

Introduction

This section identifies the switches that are supported by CallPilot.

Meridian 1

The supported Meridian 1 platforms include

- Option 11C
- Option 11C Mini
- Option 81
- Options 51C through 81C

For North America, you need Release 23.55 or higher. For Europe, you need Release 24 or higher.

For information about the connectivity requirements, see “Meridian 1” on page 60.

MSL-100 or DMS-100 (Centrex)

Hardware requirements

For an MSL-100 switch, you must have a sufficient number of Line Side T1 cards for the number of channels purchased. Refer to the *Line Side T-1 Interface (LT1) for IPE Services Guide* (NTP 555-4001-022) for instructions on installing Line Side T1 cards.

Note: The Line Side T1 cards must be configured for ground start. CallPilot does not support loop start.

A DMS-100 switch requires an external channel bank to support Centrex service.

The switch must have either an IOC shelf with an NT1X89 card or an IOM to support the SMDI link to CallPilot.

Software requirements

The MSL-100 switch requires MSL-10 software or higher. The DMS-100 requires NA08 software or higher.

See also

For information about the connectivity requirements, see “MSL-100/DMS-100” on page 63.

Lucent

The Definity Generic 3 Lucent switch is supported through Digital Set Emulation (DSE).

Software and line card requirements

You need the Voice Mail Application option and one of the following software releases and line cards:

Software release	Line card
G3V3+	TN2181 V7
G3V6+	TN2224

See also

For information about the connectivity requirements, see “Lucent, Mitel, or Rolm” on page 65.

Matra

All Matra switch models are supported.

Software requirements

You need one of the following software releases:

- version 11.5F or later for Voice Messaging only (available on all models)
- version 11.6 for Voice, Fax, and ASR (available only on MC6501)
- version 12.2.1 or later for Voice, Fax, and ASR (available on all models)

Analog line cards

You need one of the following loop-start analog line cards:

Matra model	Supported line cards
M6501	■ HJ2843A-LA4 (4 analog channels) ■ HJ2763A-LA8 (8 analog channels)
M6502 M6504 M6540 M6550	■ HJ3944A-LAE (32 analog channels) ■ HJ3806A-LAF (16 analog channels)

See also

For information about the connectivity requirements, see “Matra” on page 66.

Mitel

The following table identifies the Mitel switches, software, and line cards that provide Digital Set Emulation (DSE):

Switch	Software	Line card
SX-200D	Lightware 15 +	Digital Line
SX-200 Light	Lightware 15 +	Digital Line
SX-2000 Light	All M Streams	DNI line: MC330
SX-2000 S	All M Streams	DNI line: MC330
SX-2000 VS	All M Streams	DNI line: MC330

See also

For information about the connectivity requirements, see “Lucent, Mitel, or Rolm” on page 65.

Rolm

You need the Message Waiting Interface option and one of the following Rolm switches that are supported through Digital Set Emulation (DSE):

Switch	Software	Line card
8000	8003 +	RPI 1 and 2: 78011 and 78012
9000	All versions	RPI 1 and 2: 78011 and 78012
9751 (9005)	All versions	RLI: 90678
9751 (9006)	9006.3 to 9006.4	SLRM, SLRM2, SLRM3

See also

For information about the connectivity requirements, see “Lucent, Mitel, or Rolm” on page 65.

Administrative PC

Introduction

This section provides the hardware and software requirements for the administrative PC. The administrative PC should be connected to the ELAN to administer the switch and the CallPilot server.

CallPilot features, such as Reporter and Application Builder, are intended to run on the administrative PC.

Basic hardware specifications

The minimum hardware configuration is an Intel Pentium 90 MHz (or faster) PC with

- 32 Mbytes of RAM
- a hard disk drive with 160 Mbytes available with additional space available for Windows operations

  Note: The CallPilot software requires 160 Mbytes of space. Reporter requires additional hard disk space for the downloading and storing of data. Refer to Chapter 6, “Engineering the clients,” for more information on determining the disk space requirements.
- CD-ROM drive
- a voice/fax modem (optional) or one Ethernet Network Interface Card or Token Ring Network Interface Card. Connection to the ELAN requires an Ethernet Network Interface Card; connection to the CLAN requires either card.
- a 16-color VGA 640x480 monitor (256-color SVGA 800x600 is highly recommended)
- a sound card and microphone for recording custom prompts (optional)
- a Windows-compatible mouse

Software configuration

The administrative PC software configuration consists of the following items:

- the operating system

  The administrative PC uses the Windows 95, Windows 98, Windows 2000, or Windows NT Workstation 4.0 operating system.
- CallPilot software

Compatibility with other products and environments

Operating systems

CallPilot administration clients are compatible with the following Windows operating systems:

- Windows 95a
- Windows 95b OEM Service Release 2
- Windows 98
- Windows 98 Second Edition
- Windows NT 4.0 (Service Pack 3 or higher)
- Windows 2000

CallPilot administration clients are not supported on PCs using the following operating systems:

- Windows 95a with Service Pack 1
- dual-boot configurations (Windows 95 and Windows NT)
- non-English versions of Windows
- Unix, Linux, or Mac OS

Meridian Mail Reporter

CallPilot Reporter cannot coexist on the same PC as Meridian Mail Reporter.

Note: CallPilot Reporter only supports CallPilot. Meridian Mail Reporter supports only Meridian Mail.

Meridian Administration Tools

CallPilot administration clients can coexist on the same PC with Meridian Administration Tools (MAT) 6.6.

MS Office 2000

CallPilot administration, Reporter, and Application builder clients are compatible with Microsoft Office 2000.

Novell Netware client

CallPilot administration clients are compatible with Novell Netware client version 3.10.

See also

For more information on the administrative PC, refer to Chapter 6, “Engineering the clients.”

Web Messaging server

Introduction

If you are using the CallPilot Web Messaging feature, then the CallPilot Web Messaging software must be installed on a separate Windows NT server that is running Microsoft Internet Information Server (IIS).

Hardware requirements

The Web Messaging server requires the following minimum hardware configuration:

- Pentium 166 MHz
- 64 Mbytes of RAM
- 10 Mbps network interface card

Software specifications

The web messaging server requires the following software:

- Microsoft Windows NT 4 Server with Service Pack 3, 4, or 5
- Microsoft IIS version 4.0

Web server considerations

You must consider a number of factors when installing Web Messaging that will influence the chosen configuration. It is not necessary for the server to be dedicated to providing Web Messaging. The same server can host other web pages or also provide standard network services, such as printing and file sharing.

As with any web server, you should monitor utilization following an installation or major change, such as adding more users. This provides useful insight into server utilization and also highlights a system overload.

Consider the following information when deciding on your Web Messaging server configuration:

- the number of clients that will be using this service
- other services running on your existing web server
- how messages are played
- acceptable response times
- the number of users that can be supported

Number of clients

If this is the only desktop interface you are using, then it is likely that you will use Web Messaging more than you will use an e-mail server (such as Exchange) with a desktop client (such as Outlook).

Web server usage for other services

If you know that your existing web server is already slow, then adding this additional functionality might overload it even more. Users are also more likely to receive sluggish response times.

How messages are played

Users can play their messages on their PC speakers or headphones. Alternatively, users can play their messages on the phoneset. This eliminates the burden of transporting and converting messages from the web server and network.

If messages are played via WAV, this generates considerable web server loads. When the user downloads a message in WAV format, the message is first transferred from CallPilot to the web server. Software on the web server transcodes the VBK file to WAV format, which is a CPU-intensive activity. If you know that users will be downloading messages in WAV format, then dedicating a fast server is necessary to ensure that users receive a reasonable response time.

An alternative that eliminates the load of transcoding VBK to WAV is for the users to download the CallPilot audio player. This audio player can play VBK encoded messages.

Acceptable response times

To provide acceptable response times to large user communities, you might need to provision two or more dedicated web servers.

If user response time is slow during the busy hour, you can monitor the level of activity on the web server to see if it is overloaded. Windows NT Performance Monitor can provide this information. The two main indicators to monitor are CPU usage and available memory. If the CPU usage (shown as Processor Time) is constantly above 90 percent for a number of minutes during the busy hour, then user response time is suffering. If memory availability (shown as Available Bytes) is ever below 4 Mbytes, then user response time is suffering.

WAV downloads and the number of users who can be supported

Testing shows that such a web server can effectively support between 500 to 800 active users if they are not downloading messages in WAV format and the server is only being used for Web Messaging. If WAV downloads occur frequently, then the system can only effectively support between 100 to 200 active users.

On new systems with additional RAM and processors, such as the PII 400 MHz, testing shows that a system can support up to as many as 3000 active users if they are not downloading messages in WAV format, and the server is only being used for Web Messaging. If WAV downloads occur frequently, then the web server can only support between 500 to 1000 active users.

Desktop Messaging clients

Introduction

A client PC running either Windows 95, Windows 98, Windows 2000, or Windows NT can run the Desktop Messaging client that is available with CallPilot.

Hardware specifications

The minimum configuration should meet the following specifications:

- an IBM PC or compatible (Intel 486 or faster system)
- 16 Mbytes of RAM (32 Mbytes is highly recommended)
- a hard disk drive with 10 Mbytes available
- a CD-ROM (optional)
- 16-color VGA 640x480 (256-color SVGA 800x600 is highly recommended)
- a sound card, microphone, and speakers for recording and playback of messages (optional)
- a voice fax/modem (optional) or one Ethernet Network Interface Card or Token Ring Network Interface Card
- a Windows-compatible mouse

Desktop Messaging clients

CallPilot supports the following Desktop Messaging clients:

- Desktop Messaging for Microsoft Exchange/Outlook
- Desktop Messaging for Lotus Notes
- Desktop Messaging for Internet Mail clients
- Desktop Messaging for Novell GroupWise
- Desktop Messaging for Web Browsers

Desktop Messaging for Microsoft Outlook

The Microsoft Outlook client requires

- Microsoft Outlook 97 version 8.0
- Microsoft Outlook 98
- Microsoft Outlook 2000

Desktop Messaging for Lotus Notes

The Lotus Notes client requires Lotus Notes version 4.5, 4.51, 4.6, 4.61, or 5.0.

Desktop Messaging for Internet Mail clients

The Internet Mail client requires

- Microsoft Outlook 2000
- Microsoft Outlook 98 (running with Internet Explorer 4.01)
- Microsoft Outlook Express running with Internet Explorer 4.01 and service patch 1 (or later)
- Netscape Messenger (part of Netscape Communicator version 4.5 or later)
- Qualcomm Eudora Pro CommCenter (version 4.02 or 4.2)

Desktop Messaging for Novell GroupWise

The Novell GroupWise client requires

- Groupwise 5.5 Service Pack 1
- Windows Messaging 4.0

Desktop Messaging for Web Browsers

The Web Browser client requires

- Microsoft Internet Explorer version 3.x, 4.x, or 5.x on Windows 95, Windows 98, or Windows NT
- Netscape Navigator version 3.x or 4.x on Windows 95, Windows 98, or Windows NT

See also

For more information on the Desktop Messaging software available with CallPilot, refer to Chapter 3, “Learning about CallPilot features.”

For more information on the Desktop Messaging PC, refer to Chapter 6, “Engineering the clients.”

Section C: Connectivity requirements

In this section

Meridian 1 60
MSL-100/DMS-100 63
Lucent, Mitel, or Rolm 65
Matra 66
Customer LAN 67

Meridian 1

Introduction

The CallPilot server connects to the Meridian 1 switch using an ELAN. The ELAN uses the TCP/IP protocol at a speed of 10 Mbps.

Option 11C

The copper-connected Option 11C is not supported with CallPilot. If you are using a copper-connected Option 11C, you must upgrade to a Fiber Cabinet Option 11C to support the ELAN connection.

Tower and rackmount connectivity requirements

The tower (702t) and rackmount (1001rp) platforms connect to the IPE network loops through the MGate card. Each MGate card resides in the Meridian 1 IPE shelf and is connected to an MPB16-4 card in the CallPilot server using a 10 m (32.5 ft) twisted pair cable.

The MGate card can support a maximum of 32 channels. A fully configured 96-channel tower or rackmount system requires three MGate cards.

The MPB16-4 board provides 16 MPU resources and DS0 channel connectivity to the Meridian 1 switch. It contains two embedded DSPs and connects to the PCI bus of the tower or rackmount server. Four MPC-8 cards are supplied with the MBP16-4 card for a total DSP capacity of 48 MPU.

IPE platform connectivity requirements

The IPE platform occupies two slots in the Meridian 1 IPE shelf and interfaces with the network loops through the IPE backplane. From the Meridian 1 switch perspective, the IPE platform appears logically equivalent to an XDLC. The IPE (200i) platform contains one embedded DSP. When two MPC-8 cards are inserted into the IPE platform’s faceplate, 24 DS0 channels are supported.

The IPE platform also occupies two slots in the Meridian 1 IPE shelf, but will present itself to the switch as two MGate cards. Unlike the 200i server, the 201i server connects to the backplane for both slots to gain access to the DS30X associated with the second slot. In addition to the faceplate connectors, this server also utilizes a breakout cable, which connects to the bulkhead I/O connector associated with the first slot.The IPE (201i) platform contains one embedded DSP and two factory-installed MPC-8 cards supporting 24 DS0 channels.

ELAN requirements

CallPilot performs call control signaling to the Meridian 1 using the proprietary AML protocol (also used by Meridian Mail) running over an ELAN that runs outside the Meridian 1 cabinet. The bandwidth requirement is 10 Mbps.

You need the following items:

- MAU to 10BaseT transceiver to convert the MAU output of the Meridian 1 call processor to RJ-45 for 10BaseT connection to a hub
- Category 5 10BaseT cables for CallPilot, Meridian 1, and optional administrative PC connection to a hub
- Ethernet hub

The IPE platform ships with a 10BaseT Ethernet hub and transceiver. For the tower or rackmount platforms, you must supply your own equipment (or purchase it from Nortel Networks).

Network recommendation

Based on the size and required administrative operations of an external network, you might decide that you want to internetwork the ELAN using routers, bridges, or switches.

Direct connection of the ELAN to external networks (such as the CLAN), or improper router, bridge, or switch device selection or configuration can adversely affect the call processing abilities of ELAN-based Meridian switches and CallPilot servers.

As a result, Nortel Networks does not recommend applying router and switching technologies to the ELAN.

MSL-100/DMS-100

Introduction

The MSL-100 or DMS-100 switch uses an SMDI link and T1 channels to exchange data with the CallPilot server.

SMDI Link

The SMDI link is a data link between the second serial port (COM 2) on the CallPilot server and the MPC port on the switch. The SMDI link transports incoming call information and MWI control messages. If the CallPilot server is close to the switch (the criteria is listed in this section), then the SMDI link can be a direct cable connection between the server and the switch. For longer distances, use a modem connection.

The criteria for direct cable connection depends on whether the switch has an IOC shelf or an Input Output Module (IOM):

- With an IOC shelf, the CallPilot server must be within 15.25 m (50 ft) of the switch for a direct cable connection. Use a modem connection for longer distances.
- With an IOM, the CallPilot server must be within 230 m (750 ft) of the switch for a direct cable connection. Use a modem connection for longer distances.

The approved modem is the General DataComm 060A010-001 (North American AC version).

Line Side T1 cards

Line Side T1 cards in the MSL-100 or DMS-100 switch send the voice and data signals to the CallPilot server.

Dialogic DTI/480SC board

One or more DTI/480SC boards reside in the CallPilot server. Each DTI/480SC board supports up to two T1 links to the switch. Each T1 link supports up to 24 channels. Calls from the switch arrive at the DTI/480SC board and are passed to the MPB16-4 boards for call processing.

MPB16-4 board

The MPB16-4 board provides 16 MPU resources, contains two embedded DSPs, and connects to the PCI bus of the tower or rackmount server. Four MPC-8 cards are supplied with the MPB16-4 board for a total DSP capacity of 48 MPU. The MPC-8 cards process the voice and data signals that pass through the DTI/480SC boards.

Channel bank for DMS-100

For a DMS-100 switch, you require an appropriate channel bank.

Lucent, Mitel, or Rolm

Introduction

In this configuration, the Lucent, Mitel, or Rolm switch uses digital lines to exchange data with the CallPilot server.

VB2000 card

One or more VB2000 cards reside in the CallPilot server. Each VB2000 card contains eight ports where the digital lines from the switch terminate.

When signals arrive from the switch, the VB2000 provides the interface that interprets them and passes them to the MPB16-4 board. When CallPilot transmits data to the switch, the VB2000 card converts it to emulate the signals sent by digital sets supported by that switch.

MPB16-4 board

The MPB16-4 board provides 16 MPU resources, contains two embedded DSPs, and connects to the PCI bus of the tower or rackmount server. Four MPC-8 cards are supplied for a total DSP capacity of 48 MPU. The MPC-8 cards process the voice and data signals that pass through the VB2000 card.

Line cards

For a list of supported line cards for each switch platform, see the following:

- Lucent on page 46
- Mitel on page 48
- Rolm on page 48

Channel requirement for MWI signaling

MWI signaling to the Lucent, Mitel, or Rolm switch requires a voice channel dedication to MWI. This channel is not available for general traffic.

Matra

Introduction

In this configuration, the Matra switch uses analog lines to exchange data with the CallPilot server.

Notes: This product has not been approved for deployment in Norway because it is does not meet isolation requirements in EN6950 Saftey of Information Techology Equipment.

The Matra switch is not supported by the IPE or rackmount platforms.

Tower platform connectivity requirements

The integration to the Matra switch is an analog integration. The MPB16-2T card in the CallPilot tower platform is connected to Matra loop-start analog line cards. For a list of supported analog line cards, see page 47.

The MPB16-2T board provides both DSP resources and channel connectivity over loop-start analog lines to the Matra switch. The MPB16-2T connects to the PCI bus of the tower platform and provides 32 MPUs and 16 analog lines (channels).

Channel requirement for MWI signaling

MWI signaling to the Matra switch requires a voice channel dedication to MWI. This channel is not available for general traffic.

Customer LAN

Introduction

CLAN connectivity is required for:

- Unified Messaging
- VPIM networking
- SNMP Network Managers
- remote administrative clients (unless connecting to the ELAN through a router)

Hardware requirements

You must provide your own LAN hub and associated cables for the connection of the switch to the CallPilot server. The customer supplies the LAN hub and required cables.

Supported LAN topologies

CallPilot supports the CLAN topologies as identified in the following table:

CallPilot platforms	Ethernet: 10 Mbps	Ethernet: 100 Mbps	Token Ring: 4 Mbps	Token Ring: 16 Mbps
200i	✔	✔	✔	✔
201i	✔	✔		
702t	✔	✔	✔	✔
1001rp	✔	✔	✔	✔

Supported network protocols

CallPilot supports only the Windows TCP/IP protocol stack (Windows TCP/IP networking) on client PCs. CallPilot does not support Novell's IPX/SPX or TCP/IP protocol stack on client PCs. However, CallPilot can coexist on networks running both IPX/ SPX and other protocols as long as Windows TCP/IP is used for CallPilot client-server communication.

CLAN traffic considerations

You must ensure that the CLAN has the appropriate bandwidth capacity to handle the traffic between the client PCs and the CallPilot server. When calculating bandwidth capacity calculations, consider the following facts:

Traffic type	Bandwidth
Desktop traffic from CallPilot to a desktop client or the web server	One minute of voice consumes 200 kbytes. One page of fax averages 55 kbytes.
Web Messaging traffic from the web server to the browser on the client PC	One minute of voice in WAV format consumes 60 kbytes. One minute of voice in VBK format takes 130 kbytes. One page of fax averages 40 kbytes.
VPIM Networking traffic	One minute of voice consumes 330 kbytes.

Data transfer rates

The following table identifies, per user, the average data transfer rates in Kbps:

Traffic type	Voice Messaging	Fax Messaging	Both
Desktop Messaging	0.09	0.06	0.15
Web Messaging using WAV	0.12	0.10	0.22
Web Messaging using VBK	0.15	0.10	0.26

Notes:

- Voice messaging rates assume that 60 percent of the voice messages are transferred across the customer data network, and the remaining 40% are retrieved by phone.
- Fax messaging rates assume that 80 percent of the fax messages are transferred across the network and that fax messaging users retrieve their fax messages with either a Desktop or Web Messaging client. The other 20 percent are retrieved via fax machine.
- The transfer rates for Web Messaging files include the message transfer from CallPilot to the web server, and subsequent transfer from the web server to the web browser.
- Web Messaging with VBK (CallPilot's proprietary encoding) requires that the Nortel Networks voice player be installed on the client PC.

Chapter 3

Learning about CallPilot features

In this chapter

Overview 72

Application Builder 74

Reporter 76

Desktop and Web Messaging 77

Networking 78

Multimedia messaging 81

Overview

Introduction

This chapter lists and describes the features available with CallPilot. Key features such as Reporter, Desktop Messaging, Application Builder, and networking are explained. This chapter is helpful if you are unfamiliar with the features provided with the CallPilot software.

What features are available with CallPilot?

CallPilot provides a number of features to manage and monitor messaging activity. Key features include

- Application Builder
- Reporter
- Desktop and Web Messaging
- Networking
- Multimedia Messaging

Application Builder

Application Builder is a graphical software program that gives the administrator the ability to create multimedia applications with both voice and fax functionality that callers can access by dialing telephone numbers.

Reporter

Reporter is a software program that gives the administrator the ability to produce and print summarized and detailed reports about the use and functionality of the CallPilot system. To produce these reports, operational measurement (OM) information is downloaded from the CallPilot server and stored in a local database on the administrative PC.

Desktop and Web Messaging

Desktop and Web Messaging give mailbox users access to their CallPilot messages from their PC. Users can play back or record voice messages on the PC if it is equipped with a sound card and microphone, or users can choose to use the telephone. Users can view fax messages on the PC or print them to a fax machine.

Networking

Four types of networking solutions are supported by CallPilot:

- AMIS-Analog
- VPIM
- Enterprise
- Network Message Service (NMS)

Multimedia Messaging

CallPilot supports voice and fax messaging that provides mailbox users with

- call answering
- express messaging
- mailbox logon

CallPilot also supports speech-activated messaging.

Application Builder

Introduction

Application Builder is a graphical software program that gives the administrator the ability to create multimedia applications with both voice and fax functionality that callers can access by dialing telephone numbers.

Different levels of Application Builder

CallPilot provides two levels of Application Builder—basic and Application Builder with fax option.

Basic Application Builder gives the administrator the ability to create applications with only voice functionality.

Both voice and fax functionality are available with Application Builder with fax option.

How to purchase Application Builder

Basic Application Builder software is packaged with the CallPilot software and is installed as part of the CallPilot installation on the administrative PC.

The customer can optionally purchase Application Builder with fax option.

Platform availability

Basic and Application Builder with fax option are supported on all CallPilot platforms.

Channel requirements

Application Builder requires voice channels for voice-supported applications, such as voice menus and announcements.

If Application Builder with fax option is purchased, fax channels must be provisioned.

For more information on calculating the number of voice and fax channels required to support Application Builder, refer to Chapter 4, “Determining system size.”

Limits within Application Builder

Certain limits exist within Application Builder to restrict the number of items in an application. The following table details these limits:

Item	Limit
Number of Application Builder services	2500
Levels of services imported into an Application Builder service	20
Number of faxes stored in an Application Builder service	3000
Number of voice prompts in an Application Builder service	3000

You can install and run Application Builder on more than one administrative PC.

See also

For more information on calculating storage space required on the server, refer to Chapter 4, “Determining system size.”

Reporter

Introduction

Reporter is a software program that gives the administrator the ability to produce and print summarized and detailed reports about the use and functionality of the CallPilot system. To produce these reports, operational measurement (OM) information is downloaded from the CallPilot server and stored in a local database on the administrative PC.

How to purchase Reporter

Reporter is packaged with CallPilot software and is installed as part of the CallPilot installation on the administrative PC.

Platform availability

Reporter is supported on all CallPilot platforms.

Number of servers that Reporter can access

A single administrative PC can download OMs from a maximum of 50 servers. A separate database is created on the administrative PC for the data downloaded from each of the servers. The maximum size of each of these databases is 550 Mbytes.

Consider the amount of time spent downloading, amount of data downloaded, time to generate reports, and available disk space when determining the number of servers that a single administrative PC running Reporter can accommodate.

See also

For more information on calculating storage space required on the server, refer to Chapter 4, “Determining system size.”

For more information on calculating disk space required on the administrative PC, refer to Chapter 6, “Engineering the clients.”

Desktop and Web Messaging

Introduction

Desktop and Web Messaging give mailbox users access to their CallPilot messages from their PC. Users can play back or record voice messages on the PC if it is equipped with a sound card and microphone, or users can choose to use the telephone. Users can view fax messages on the PC or print them to a fax machine.

How to purchase Desktop and Web Messaging

The Desktop and Web Messaging features are optional with the purchase of CallPilot.

Limitations on the number of PCs running the software

There is no limit to the number of PCs that can run the Desktop Messaging software. There is, however, a limit on the number of mailbox users who can access the Desktop server at one time—a maximum of 1000 concurrent users on a 200i or 201i server, and 5000 concurrent users on a 702t or 1001rp server.

LAN requirements

Nortel Networks recommends that the Desktop or Web Messaging client be connected to the Customer LAN.

Platform availability

Desktop and Web Messaging are supported on the Windows 95, Windows 98, Windows 2000, and Windows NT 4.0 platforms.

See also

For more information on engineering the Desktop or Web Messaging client, refer to Chapter 6, “Engineering the clients.”

Networking

Introduction

Four types of networking solutions are supported by CallPilot:

- AMIS-Analog
- VPIM
- Enterprise
- Network Message Service (NMS)

How to purchase networking

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

During installation of CallPilot, you can select which networking solutions you want to install.

AMIS-Analog Networking

AMIS-Analog Networking allows users to exchange messages with users of any voice messaging systems that support the AMIS protocol. This protocol is an industry-standard protocol for exchanging voice messages.

You can use AMIS-Analog Networking to network with other CallPilot systems, existing Meridian Mail systems, Norstar, or other third-party AMIS-compliant systems.

VPIM Networking

VPIM Networking provides CallPilot with the capability to exchange multimedia messages with a standard data communications network. Messages can contain voice, fax, or both.

You can use VPIM Networking to network with other CallPilot systems, existing Meridian Mail Net Gateway (MMNG) systems, Norstar, or other third-party VPIM-compliant systems.

Enterprise Networking

Enterprise Networking is Nortel Network's proprietary analog networking protocol for voice messages.

You can use Enterprise Networking to network with other CallPilot systems or existing Meridian Mail systems that support Enterprise Networking.

Network Message Service

For Meridian 1 switches, Network Message Service (NMS) permits one CallPilot messaging server to provide messaging services to users on more than one switch location. In this configuration, a single server connected to one switch can provide services to a number of switches interconnected with the appropriate trunks.

Platform availability

Enterprise, AMIS, and VPIM networking are supported on all CallPilot platforms.

Channel requirements

All analog networking solutions can use voice channels.

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

Limits within networking

Certain limits exist within networking to restrict the number of sites. The following table details these limits:

Item	Limit
Number of private network sites	500
Number of CDP steering codes per location	500
Number of open VPIM network sites	500
Number of NMS satellite locations	59

See also

Refer to the *Network Planning Guide* for detailed information on selecting the type of networking appropriate for your site.

Multimedia messaging

Introduction

CallPilot supports voice and fax messaging that provides mailbox users with

- call answering
- express messaging
- mailbox logon
- outcalling (such as Remote Notification and Delivery to Telephone)

CallPilot also supports speech-activated messaging.

How to purchase multimedia messaging

A customer can optionally purchase the voice messaging, fax messaging, and speech-recognition features. These features are enabled by mailbox.

Limits within multimedia messaging

Certain limits exist within multimedia messaging to restrict the multimedia features:

- 99 personal distribution lists (PDL), with 200 entries per PDL
- 150 shared distribution lists (SDL) with up to 999 entries per SDL
- speech recognition for mailbox logon and navigation
- maximum number of mailboxes:
  - IPE platform: 8000
  - tower and rackmount platforms: 20 000

Platform availability

All CallPilot platforms support multimedia messaging.

Channel requirements

If a mailbox has fax messaging capability, fax channels are required.

Note: Each call that is forwarded to the fax messaging capable mailbox is serviced by a fax channel (the equivalent of two voice channels), regardless of whether or not the caller intends to leave a fax.

If a mailbox has speech-activated messaging capability, speech-recognition channels are required.

Chapter 4

Determining system size

In this chapter

Overview 85

Section A: About channel requirements 87

An overview of channels 88

Guidelines for determining channel requirements 90

Section B: Determining voice channel requirements 93

Steps to follow in determining the number of voice channels 94

To help you determine voice channel requirements 96

Determining the busy hour activity 98

Determining the activity of all voice services 99

Determining network activity 100

Determining Outcalling activity 101

Determining the number of voice channels required 102

Section C: Determining fax channel requirements 105

An overview of fax channels 106

Determining the number of fax channels 107

To help you determine fax channel requirements 109

Determining the busy hour fax menu activity 111

Determining the busy hour traffic for fax callback activity 113

Determining the busy hour traffic for fax auto attendant 114
Determining the busy hour fax messaging activity 116
Calculating the number of fax channels required 117
Calculating the number of fax channels for fax broadcasting activity 118
Section D: Determining speech-recognition channel requirements 121
Determining the number of speech-recognition channels required 122
Section E: Determining the number of MPUs required 125
Calculating the number of MPUs required 126
Section F: Determining storage hour requirements 129
Steps to follow in estimating your storage hours 130
To help you determine storage hour requirements 131
Determining the mailbox storage requirements 133
Calculating storage hours for Application Builder 136
Section G: Calculating system size 139
Before you calculate your system size 140
Calculating your system size 141

Overview

Introduction

To determine an appropriate CallPilot system size, follow these steps:

1. Estimate the channel requirements.
2. Estimate the MPU requirements.
3. Estimate the storage size requirements.
4. Determine the platform required.

All of the above are automated when planning the customer order. In addition, you can use the CallPilot Engineering spreadsheet (Microsoft Excel) to perform these calculations. To obtain the spreadsheet, contact your Nortel Networks distributor. If you are a Nortel Networks distributor, you can obtain the spreadsheet from the CallPilot area of the Nortel Networks NIC web site at http://www.nortelnetworks.com/partnercenter/.

If you choose to perform manual calculations, this chapter helps you estimate the number of MPUs and hours of storage your CallPilot system requires, based upon the estimated system usage.

Channel requirements

To ensure that your CallPilot system has the necessary processing power required to handle the volume and type of incoming calls, you must determine the number and type of channels required. To determine this, do the following:

1. Determine the type of channels required.
2. Determine the number of channels required for each media.

MPU requirements

After you have calculated the number of voice, fax, and speech-recognition channels, you can determine the number of MPUs required by your CallPilot system.

After performing this calculation, you must calculate the additional hardware necessary to support the number of MPUs.

Storage hour requirements

The storage hours your CallPilot system requires depend on the requirements for

- message storage, which includes stored messages and personal verifications
- voice services, which include voice menus, announcements, and fax definitions (all available with Application Builder)

Note: The storage space required for voice prompts is part of the CallPilot package and, therefore, is not counted in the storage hours figures.

System size requirement

After you calculate the number of MPC-8 cards required for voice processing, and the number of storage hours required for messages and Application Builder, you can determine which platform supports your needs. See page 141.

Section A: About channel requirements

In this section

An overview of channels 88
Guidelines for determining channel requirements 90

An overview of channels

Introduction

To ensure that your CallPilot system has the necessary processing power required to handle the volume and type of incoming calls, you need to determine the number and type of channels required, and the hardware to support them. To determine this, do the following:

1. Determine the type of channels required.
2. Determine the number of channels required for each media.

This section provides an overview of MPC-8 cards, MPUs, and the different types of channels available with CallPilot.

For Meridian Mail users

If you are upgrading from Meridian Mail to CallPilot, you will be familiar with determining the number of ports required. With CallPilot, a port now has two components—a channel and one or more MPUs.

Definition: channels

There are three different types of channels to handle the various types of media supported by CallPilot:

- voice
- fax
- speech-recognition (ASR)

As part of planning and engineering your system, you must estimate how many voice, fax, and speech-recognition channels you require. You can configure channels for voice only, fax and voice, or speech-recognition with fax and voice.

Definition: MPUs

An MPU is a measure of Digital Signal Processing (DSP) processing power. It supports a session or connection of different media types (for example, voice, fax, and speech-recognition).

A voice channel requires one MPU, a fax channel requires two MPUs, and a speech-recognition channel requires four MPUs.

Definition: MPC-8

A Multimedia Processing Card (MPC-8) is a credit-card sized PC card that resides in the CallPilot server. It receives data from calls that arrive from the switch and processes the data as required.

Each MPC-8 has eight MPUs.

MPUs and channels

The number of MPUs required to process a call depends upon the type of call.

For example, one MPU can transport one voice call to a voice channel. Multiple MPUs, however, are required to transport one fax or one speech-recognition call to a channel, as shown in the following table:

Media channel type	Description
Voice	There is a one-to-one correspondence between voice channels and MPUs.
Fax	Fax media requires two MPUs.
Speech-recognition	Speech-recognition media requires four MPUs.

Guidelines for determining channel requirements

Introduction

To help you with the task of determining your system size, this chapter uses specific guidelines that you should be familiar with before starting any of the calculations.

Busy hour

Channel requirements are determined by using standard traffic engineering principles. One of these principles is the calculation of busy hour (BH) traffic, that is, the highest traffic hour for CallPilot.

To calculate busy hour traffic, you add the total call seconds (connect time) and divide by 100. Busy hour traffic is calculated in BH CCS (busy hour centa [hundred] call seconds).

When calculating busy hour traffic, keep in mind that, for a typical business, the busy hour usually occurs between 10:00 a.m. and 11:00 a.m. or between 2:00 p.m. and 3:00 p.m on weekdays. For individual businesses, the busy hour period can vary. You should be aware of these factors to engineer a system that can truly handle your peak traffic requirements.

Channel requirements for specific switches

The key differences between sizing non-Meridian 1 switches versus Meridian 1 are as follows:

- CallPilot systems that are connected to Lucent, Mitel, Rolm, and Matra switches must dedicate one of their voice channels to MWI signaling. This means that the voice channel sizing must be adjusted for the loss of the MWI channel.

- Mitel, Rolm, and Matra switches do not support queuing for callers to busy channels. Callers to busy channels either receive busy treatment or are overflowed to a live (if answered) answering position. That is, these calls are blocked from accessing CallPilot channel resources. This effectively reduces the call carrying capacity of the channels. Consequently, Nortel Networks recommends that you use the Erlang B/P02 traffic table to provide an adequate grade of service.
- If you are using a switch that supports queueing (Meridian 1, MSL-100, and Lucent), Nortel Networks recommends that you use an Erlang C P.05 traffic table.

Traffic tables to use when estimating channel requirements

The following table summarizes which traffic table to use to estimate the required channels by media and switch type. For the actual tables, see Appendix A, "Traffic capacity tables."

	Busy hour CCS (BHCCS) traffic capacity table type			
Switch and media type	**Erlang C P.05 BHCCS (40 second AHT)**	**Erlang C P.05 BHCCS (adjust for one MWI channel)**	**Erlang B P.02 BHCCS**	**Erlang B P.02 BHCCS (adjust for one MWI channel)**
Meridian 1 and MSL-100 Voice, Fax, and ASR	✔			
Lucent Voice		✔		
Lucent Fax and ASR	✔			
Mitel, Rolm, Matra Voice				✔
Mitel, Rolm, and Matra Fax and ASR			✔	

Note: These traffic tables are accounted for when using the automated method of planning the customer order. They are also accounted for when using the engineering spreadsheet that is available on the Nortel Networks NIC web page at http://www.nortelnetworks.com/partnercenter/.

Section B: Determining voice channel requirements

In this section

Steps to follow in determining the number of voice channels 94
To help you determine voice channel requirements 96
Determining the busy hour activity 98
Determining the activity of all voice services 99
Determining network activity 100
Determining Outcalling activity 101
Determining the number of voice channels required 102

Steps to follow in determining the number of voice channels

Introduction

There are four steps in calculating the number of voice channels for your system:

1. Determine the busy hour activity.
2. Determine the busy hour activity of all Application Builder services.
3. Determine the networking activity.
4. Estimate the outcalling activity.

This section provides an overview of these steps.

Determine the busy hour

Your first step is to determine the busy hour messaging activity or connect time. This is the anticipated activity of CallPilot during the busy hour. For instructions on performing this task, see “Determining the busy hour activity” on page 98.

Determine the busy hour activity of all CallPilot services

Your second step is to determine the busy hour activity of all services that use voice channels. This includes Application Builder services such as voice menus and automated attendant. For instructions on performing this task, see “Determining the activity of all voice services” on page 99.

Determine the networking activity

Networking activity using voice channels might need to be calculated if networking is purchased. For instructions on performing this task, see “Determining network activity” on page 100.

If VPIM is the only networking solution installed, you do not need to determine the networking activity.

Estimate the Outcalling activity

If Outcalling has been purchased, you must calculate the number of voice channels required for this service. For instructions on performing this task, see “Determining Outcalling activity” on page 101.

Determine the total number of channels

Add the figures from the above four steps to obtain a total of the number of voice channels required.

To help you determine voice channel requirements

Introduction

A worksheet is provided to help you calculate the busy hour activity and the number of voice channels required.

Worksheet

Complete the following worksheet to determine the number of voice channels your CallPilot system requires. The procedures on the following pages should help you complete the worksheet.

Busy hour system activity and channels required

			Voice activity (Call-seconds)
1	**Voice Messaging activity**	1	
2	**Activity of all services (add 2a through 2d)**	2	
	2a Voice Menu activity _____		
	2b Announcements activity _____		
	2c Auto attendant activity (if used during busy hour) _____		
	2d Fax on Demand callback menu _____		
3	**Analog networking activity (if installed)**	3	
4	**Outcalling activity (if in use)**	4	
5	**Add lines 1 through 4.**	5	
6	**Divide line 5 by 100 to determine the total busy hour activity in CCS.**	6	
7	**Number of channels required. Look up the CCS recorded in line 6 in Appendix A, "Traffic capacity tables," to determine the number of voice channels required.**	7	

Determining the busy hour activity

Introduction

Follow this procedure to determine the busy hour voice messaging activity. Record the result in box 1 on the worksheet.

To determine the busy hour messaging activity

1. Estimate the average connection time per registered user during the busy hour.

   This includes both the time the mailbox user is logged on to CallPilot and the time callers use to leave messages for that user.

   The normal range is 30 to 60 seconds per user. A reasonable assumption is 40 seconds per user.

2. Determine the number of voice messaging users.
3. Multiply the result of step 1 by the result of step 2.
4. Record the result in box 1 of the worksheet.

Example

If the average connection time is 40 seconds and you have 1000 CallPilot users at your site, the total seconds of voice messaging activity is 40 000.

Determining the activity of all voice services

Introduction

Services that use voice channels include Application Builder, Voice Menus, Voice Call Answering, and Voice Messaging. It is important to analyze your specific services since many services vary widely in the number of calls requiring processing and in the holding times of those calls.

To calculate the busy hour activity

1. Estimate the average length of a call during the busy hour.

   The type of service determines the average length. For an information-type menu, a reasonable assumption is 60 seconds per call. An automated attendant has a much smaller average call length in the range of 15–30 seconds.

2. Estimate the number of calls during the busy hour.

3. Multiply the result of step 1 by the result of step 2.

   The result is the estimated busy hour activity for that particular service.

4. Record the total.

5. Repeat steps 1 through 4 for each service (that is, voice menus and announcements).

6. Record the result in the appropriate step 2 box of the worksheet.

7. Repeat steps 1 through 6 for each service.

Determining network activity

Introduction

AMIS and Enterprise Networking use voice channels to send and receive messages. To calculate the networking activity, follow the procedure in this section. A typical assumption is that networking traffic increases overall voice messaging traffic by five percent. For more information on planning for networking, see the *Network Planning Guide.*

To determine the networking activity

1. Multiply the result in box 1 of the worksheet by 0.05.
2. Record the result in box 3 of the worksheet.

Determining Outcalling activity

Introduction

Outcalling (which collectively refers to the Remote Notification, Delivery to Fax, and Delivery to Telephone services) can be used in different ways by different organizations, so channel requirements vary from one organization to the next. You must consider how your site will use Outcalling, especially during the busy hour.

Determining how your site will use Outcalling

Voice channel requirements for Outcalling can be limited or unlimited depending on how this service is used at your site. The following table provides several scenarios for using Outcalling:

IF	THEN
only a small number of users will be using Delivery to Telephone, Remote Notification, or both	the effect of these services on your overall system requirements will be small and can be ignored at this point.
the Delivery to Telephone service will be restricted to low-traffic periods (for example, after-hours)	the service should have no impact on your system requirements.
a large number of users will be accessing Delivery to Telephone, Remote Notification, or both	estimate what the usage will be in CCS and record it in box 4 of the worksheet. Use the same voice message holding time as you used earlier.

Determining the number of voice channels required

Introduction

After estimating the busy hour activity for the voice services supported by CallPilot, you can calculate the total number of voice channels required. Follow the procedures in this section to determine the number of voice channels required.

Assumptions for determining voice messaging use

While usage patterns differ from customer to customer, you can make assumptions about typical use of the system. The following assumptions allow typical business traffic estimation for a given user population:

- 25% of the time is at busy hour traffic (approximately 2 hours).
- 5% of the time is at greater than busy hour traffic (approximately 25 minutes).
- 70% of the time is at less than 75% of busy hour traffic (approximately 5 hours and 35 minutes).
- The average call-holding time is 40 seconds for voice messaging.
- Typically, a maximum of 20% of logon calls use messaging features.
- The busy hour traffic is 13% of the average daily traffic. The amount of traffic generated in one 24-hour period is equivalent to 7.69 hours of busy hour traffic.

To determine the number of voice channels required

1. Add the totals from the previous procedures and record the result in box 5 of the worksheet.
2. Divide the result in box 5 by 100 to get the estimated busy hour voice activity in centa (hundred) call seconds (CCS). Record the result in box 6.
3. Refer to the traffic capacity table provided in Appendix A, “Traffic capacity tables,” to determine the number of channels required.

   From the table, find the CCS calculated in step 2. The corresponding value in the column labeled “Number of channels” is the number of channels required to accommodate the estimated total system activity. Record the result in box 7.

Section C: Determining fax channel requirements

In this section

An overview of fax channels 106
Determining the number of fax channels 107
To help you determine fax channel requirements 109
Determining the busy hour fax menu activity 111
Determining the busy hour traffic for fax callback activity 113
Determining the busy hour traffic for fax auto attendant 114
Determining the busy hour fax messaging activity 116
Calculating the number of fax channels required 117
Calculating the number of fax channels for fax broadcasting activity 118

An overview of fax channels

Introduction

The number of fax channels your site requires depends on how you plan to offer multimedia services. The options available are same call delivery and callback delivery.

Same call delivery

With same call delivery, a caller who has accessed a voice menu with fax items can select and receive a fax during the same call (that is, using the same line). For this type of voice menu service, the voice menu must run on a fax channel. Only a fax channel can provide both the voice and fax services required for a voice menu with same call fax delivery.

Similarly, fax announcements that use same call delivery (a caller reaches the announcement service, hears a greeting, and receives a fax in the same call) must use a fax channel.

To calculate traffic requirements for voice menus with fax items (same call delivery), refer to “Determining the busy hour traffic for fax callback activity” on page 113. To calculate the traffic requirements for a fax announcement service with same call delivery, refer to “Determining the busy hour traffic for fax auto attendant” on page 114.

Callback delivery

With callback delivery, the caller who has accessed a voice menu with fax items must provide a fax number for the fax delivery. After the caller completes the call, CallPilot uses a fax channel to deliver or send the selected fax items to the specified fax number.

Determining the number of fax channels

Introduction

There are four steps in calculating the number of fax channels for your system:

1. Determine the busy hour for voice menus with fax items.
2. Determine the busy hour for fax callback.
3. Determine the connect time for fax announcements.
4. Determine the busy hour for fax messaging activity.

If fax broadcasting is used at a customer site, you must also estimate the number of channels required to support this service.

This section provides an overview of these steps.

Determine the busy hour for voice menus that offer fax menu items

Your first step is to determine the busy hour activity or connect time for voice menus that offer faxes as one or more menu items. For instructions on performing this task, see page 111.

Determine the busy hour activity for fax callback deliveries

Your second step is to determine the busy hour activity for fax delivery to a fax number specified by a caller. For instructions on performing this task, see page 113.

Determine the connect time for fax announcements

Fax announcements that deliver the fax during the same call require a fax channel. Calculate the total busy hour connect time for this type of announcement. For instructions on performing this task, see page 114.

Determine the busy hour for fax messaging

Mailbox users who are configured for fax messaging require a fax channel to receive, print, or send faxes. Calculate the busy hour activity for fax messaging by following the procedure on page 116.

Determine the total number of channels

Add the figures from the above four steps to obtain a total of the number of fax channels.

If Fax Broadcasting is used, you must take into consideration the number of channels required to support this service.

To help you determine fax channel requirements

Introduction

A worksheet is provided to help you calculate the busy hour activity and the number of fax channels required.

Worksheet

Complete the following worksheet to determine the number of fax channels your CallPilot system requires. The procedures on the following pages should help you complete the worksheet.

Fax busy hour system activity and channels required

			Activity (Call-seconds)
1	Voice menus with fax items (same call delivery)	1	
2	Fax callback activity	2	
3	Fax announcement activity (same call delivery)	3	
4	Fax messaging activity	4	
5	Add lines 1 through 4.	5	
6	Divide line 5 by 100 to determine the total activity in CCS.	6	
7	Number of fax channels required. Look up the CCS recorded in line 6 in Appendix A, “Traffic capacity tables,” to determine the number of fax channels required.	7	
8	Number of channels dedicated to Multicast to Fax	8	

Determining the busy hour fax menu activity

Introduction

With the Fax on Demand feature, you can set up voice menus that offer faxes as some of the menu items. A caller who reaches a fax voice menu can select faxes to receive. If the caller is calling from a phone line that is also connected to a fax machine, the fax can be delivered during the same call (same call delivery).

Follow this procedure to estimate the call connect time for fax voice menus during the busy hour. Record the result in box 1 on the worksheet.

To determine the call connect time

1. Select a fax voice menu and estimate the average duration of calls during the busy hour.

   When estimating this duration, include the following:

   - time to listen to the menu greeting
   - time to listen to the voice menu and select as many faxes as required
   - time to receive “same call” faxing instructions
   - time to transmit the faxes selected
     - about 12 seconds to establish protocol
     - 40 seconds per page in normal resolution; 80 seconds per page in fine resolution
     - about 10 seconds to complete the fax delivery (that is, end protocol/ disconnect)

2. Estimate the number of calls to this menu during the busy hour. This depends on the specific function of the fax voice menu in your organization.
3. Multiply the result of step 1 by the result of step 2 to determine the estimated total activity generated from this fax voice menu during the busy hour.

4 Record the total.

5 Repeat steps 1 through 4 for each fax voice menu.

6 Add all the voice menu totals together and record the result in box 1 of the worksheet.

Determining the busy hour traffic for fax callback activity

Introduction

A voice menu with fax items might require the caller to specify a fax number to receive the selected faxes. With this type of voice menu, CallPilot uses a fax channel to call the specified fax number and deliver the selected faxes.

The voice menu and fax selection part of the process can use a voice channel or fax channel. Only the actual fax delivery call requires a fax channel.

To estimate the total busy hour connect time for fax callback deliveries

1. Estimate the average duration of fax callback delivery calls during the busy hour. When estimating this duration, include the following:
   - 10 seconds to set up the call
   - 14 seconds to answer the call
   - 12 seconds to establish the protocol
   - 40 seconds per page in normal resolution; 80 seconds per page in fine resolution
   - 10 seconds to complete the fax delivery (that is, end protocol/ disconnect)
2. Estimate the number of fax callback deliveries during the busy hour.
3. Multiply the result of step 1 by the result of step 2 to determine the estimated total connect time used by fax callback deliveries in the busy hour.
4. Record the result in box 2 on the worksheet.

Determining the busy hour traffic for fax auto attendant

Introduction

A fax announcement service that requires the caller to enter a fax callback number requires a fax channel only for the callback delivery. For these types of announcements, refer to "Determining the number of voice channels required" on page 102. To estimate the traffic generated by the actual fax delivery, see the section "Determining the busy hour traffic for fax callback activity" on page 113.

A fax announcement service that delivers the fax during the same call (no callback number is required) must use a fax channel for the entire call. Follow the procedure in this section to estimate the connect time for these types of announcements.

To estimate the connect time for fax announcements with same call delivery

1. Select a fax announcement and estimate the average duration of calls to this fax announcement during the busy hour.

   When estimating this duration, include the following:

   - time to listen to prompts and instructions and to enter the number
   - time to transmit the fax
     - about 12 seconds to establish protocol
     - 40 seconds per page in normal resolution; 80 seconds per page in fine resolution
     - about 10 seconds to complete the fax delivery (that is, end protocol/ disconnect)

2. Estimate the number of calls to the announcement during the busy hour. This depends on the specific function of this fax announcement in your organization.

3 Multiply the result of step 1 by the result of step 2 to determine the estimated total activity generated during the busy hour.

4 As the fax must be delivered as well, estimate delivery time by including the time to transmit the fax and multiplying by step 2.

5 Add the step 3 and step 4 totals together and record the result in box 3 of the worksheet.

Determining the busy hour fax messaging activity

Introduction

Mailbox users who are configured for fax messaging require a fax channel to receive, print, or send faxes. A fax channel is not required to access a mailbox to listen to voice messages or to listen to the print status of a fax message.

Fax messaging users who are also Desktop Messaging users can view and print faxes using their desktop as opposed to using CallPilot to print their fax messages.

To estimate the busy hour fax messaging activity

1. Estimate the average duration of calls to receive an incoming fax message. A typical estimate for a three-page fax in normal resolution is 142 seconds. For the same fax in fine resolution, a typical estimate is 262 seconds.
2. Estimate the number of fax messaging users who will receive fax messages during the busy hour. This depends upon whether you anticipate the fax users at the site to be heavy users of fax messaging.
3. Estimate the number of fax messaging users who print fax messages during the busy hour. If you use the auto print feature at the site, this value will be approximately the same as the number received.
4. Multiply the result of step 1 by step 2.
5. Multiply the result of step 1 by step 3.
6. Add step 4 and step 5 and record the result in box 4 of the worksheet.

Calculating the number of fax channels required

Introduction

After estimating the busy hour activity for the fax services supported by CallPilot, you can calculate the total number of fax channels required.

Assumptions for determining fax messaging use

While usage patterns differ from customer to customer, you can make assumptions about typical use of the system. The following assumptions allow typical business traffic estimation for a given user population:

- The average fax message received is three pages and is received in normal resolution.
- The holding time for an average fax message is 142 seconds per call.

To calculate the number of fax channels required

1. Add the totals from the previous procedures and record the result in box 5.
2. Divide the result in box 5 by 100 to get the estimated busy hour fax activity in centa (hundred) call seconds (CCS), and record the result in box 6 of the worksheet.
3. Determine the number of fax channels required based on the estimated busy hour fax activity.

   Refer to the traffic capacity table provided in Appendix A, “Traffic capacity tables,” to determine the number of channels required.
4. Record the result in box 7 of the worksheet.

Calculating the number of fax channels for fax broadcasting activity

Introduction

Fax broadcasting is an industry standard term used to describe sending a fax to many destinations. CallPilot has a service called Multicast to Fax that supports fax broadcasting activities. It is distinguished from Delivery to Fax (DTF) service to prevent using DTF channels when a fax broadcast is sent. If a CallPilot system is also using Fax on Demand (FOD), fax call answering, and fax buffering mailbox type service, it is important that broadcasting does not degrade the quality of service from those services.

If Multicast to Fax is not used at a customer site, there is no need to perform the calculations below.

If Multicast to Fax will be used, Nortel Networks strongly recommends that you use the service during off-peak hours or establish a maximum number of channels for this service in the SDN table (if there are other fax services competing for fax channels). The following procedure shows you how to calculate the maximum number of fax channels.

To calculate the number of fax channels

1 Estimate the average duration of a delivery to a single recipient. Each call takes

- 10 seconds to set up the call
- 14 seconds to answer the call
- 12 seconds to establish the protocol
- 40 seconds per page (normal resolution) or 80 seconds per page (fine resolution)
- 10 seconds to complete the delivery

2 Estimate the average number of recipients in a fax broadcast.

3 Multiply the result of step 1 by step 2 and then divide by 100 to get the average CCS required by a broadcast.

4 Estimate the number of fax broadcasts in a day.

5 Multiply the result of step 3 by step 4 to get the total number of CCS required to deliver broadcast messages per day.

6 Experiment with the following calculation to determine the delivery time window you want to achieve with the maximum number of fax channels available for Multicast to Fax service. Record the result in box 8 of the fax worksheet.

(Total CCS of delivery) / (number of channels dedicated * 36) * 60 minutes = delivery time in minutes

Example

If you calculated a CCS of 63, the amount of time to send the message to 50 recipients is as follows:

1 channel provides 36 CCS per hour (63/36) * 60 = 105 minutes to deliver

2 channels provide 72 CCS per hour (63/72) * 60 = 53 minutes to deliver

4 channels provide 144 CCS per hour (63/144) * 60 = 26 minutes to deliver

Section D: Determining speech-recognition channel requirements

In this section

Determining the number of speech-recognition channels required 122

Determining the number of speech-recognition channels required

Introduction

The number of speech-recognition channels you require depends upon the number of users who use the speech activated messaging service. As this service is provided to enable mailbox access for those who work outside the office, busy hour for those channels might be outside normal office hours, particularly if the user accesses the messages while commuting.

To determine the number of speech-recognition channels required, calculate the average amount of time it takes to log on to a mailbox and play back messages using speech-recognition services.

Assumptions for determining speech-recognition messaging use

While usage patterns differ from customer to customer, you can make assumptions about typical use of the system. The following assumption allows typical business traffic estimation for a given user population:

- The average call time is 100 seconds for land line calls. This includes only the time that users call in to retrieve their messages. It does not include call answering times.

Worksheet

Complete the following worksheet to determine the number of speech-recognition channels your CallPilot system requires. The procedures below should help you to complete the worksheet.

Speech recognition busy hour system activity and channels required

			Activity (Call-seconds)
1	Messaging activity	1	
2	Divide line 1 by 100 to determine the total activity in CCS.	2	
3	Number of speech recognition channels required. Look up the CCS recorded in line 2 in Appendix A, "Traffic capacity tables," to determine the number of speech recognition channels required.	3	

To determine the number of speech-recognition channels

1 Estimate the average connection time per registered user during the busy hour.

This includes both the time the mailbox user is logged on to CallPilot and the time used to play back messages. The normal range is 75 to 120 seconds per user. A reasonable assumption is 100 seconds per user.

2 Determine the number of speech-recognition users.

3 Multiply the result of step 1 by the result of step 2 and record the results in box 1 of the worksheet.

4 To calculate the CCS, divide the result of step 3 by 100 and record the result in box 2.

5 Refer to the traffic capacity table provided in Appendix A, "Traffic capacity tables," to determine the number of channels required.

From the table, find the CCS listed in box 2 of the worksheet. The corresponding value in the column labeled "Number of channels" is the number of channels required to accommodate the estimated total system activity.

6 Record the result in box 3 of the worksheet.

Section E: Determining the number of MPUs required

In this section

Calculating the number of MPUs required 126

Calculating the number of MPUs required

Introduction

After you have calculated the number of voice, fax, and speech-recognition channels, you can determine the number of MPUs required by your CallPilot system.

After performing this calculation, you must calculate the additional hardware necessary to support the number of MPUs.

Worksheet

Complete the following worksheet to calculate the number of MPUs your CallPilot system requires.

MPUs required for voice, fax, and speech recognition services

1	**Number of channels required for voice services**	1
2	**Number of channels required for fax services multiplied by 2**	2
3	**Number of channels required for speech recognition multiplied by 4**	3
4	**Add lines 1 through 3.**	4

To determine the number of MPUs required

1. Copy the figure from box 6b on the voice channel worksheet into box 1 on the above worksheet.
2. Multiply the figure from box 8 on the fax channel worksheet by 2. Record the result in box 2 on the above worksheet.

   Note: Since every fax channel requires 2 MPUs, you must multiply the number of channels by 2 to get the number of MPUs.
3. Multiply the figure from box 3 on the speech-recognition worksheet by 4. Record the result in box 3.

   Note: Since every speech-recognition channel requires 4 MPUs, you must multiply the number of channels by 4 to get the number of MPUs.
4. Add boxes 1 through 3 together. Record the result in box 4.

   This figure is the number of MPUs required.

Example

If you have calculated that your platform requires 8 voice channels, 4 fax channels, and 2 speech-recognition channels, you require the following number of MPUs:

Number of channels	Number of MPUs (steps 1 through 3 of the above procedure)
8 voice	8 MPUs
4 fax	4*2=8 MPUs
2 speech-recognition	2*4=8 MPUs

Add together the total number of MPUs (8 + 8 + 8 = 24 MPUs).

To determine the hardware required

DSPs and channel connectivity are provided as follows:

- IPE platform: one embedded DSP providing 8 MPUs, and two MPC-8 cards providing 16 MPUs (for a maximum of 24 MPUs)
- tower and rackmount platforms: on MPB-16 boards

  The boards provide capacity as follows:

  - Each MPB16-4 board contains two embedded DSPs (providing 16 MPUs) and comes packaged with four MPC-8 cards (each providing 8 MPUs) for a maximum of 48 MPUs.
  - Each MPB16-2T contains capacity for 32 MPUs.

IF you are using	AND you need	THEN
the IPE (200i and 201i) platform		a maximum of 24 MPUs are supported (and provided with the base package).
the rackmount platform with analog connectivity (for example, with a Matra switch)	more than 32 MPUs	you need two MPB16-2T boards.
a tower or rackmount platform with digital connectivity	more than 48 MPUs	you need two MPB16-4 boards.

Notes: You can insert a maximum of two MPB16-2T or MPB16-4 boards into the tower and rackmount platforms.

The IPE (201i) platform has 4 MPC card sockets, but only two are supported with this version of CallPilot.

Section F: Determining storage hour requirements

In this section

Steps to follow in estimating your storage hours 130
To help you determine storage hour requirements 131
Determining the mailbox storage requirements 133
Calculating storage hours for Application Builder 136

Steps to follow in estimating your storage hours

Introduction

The storage hours your CallPilot system requires depend on the requirements for

- message storage, which includes stored messages and personal verifications
- voice services, which include voice menus, announcements, and fax definitions (all available with Application Builder)

Determining your message storage requirements

Your first step is to determine the total message storage time required for the mailbox users at your site. Total message storage time depends on

- the number of mailbox users
- average storage per user (for messages and personal verifications)

To determine this value, follow the procedures in “Determining the mailbox storage requirements” on page 133.

Determining the Application Builder storage requirements

The number of storage hours required by Application Builder applications depends upon the number of prompts and the number of fax pages in an application.

To determine this value, follow the procedures in “Calculating storage hours for Application Builder” on page 136.

To help you determine storage hour requirements

Introduction

A worksheet is provided to help you calculate the number of storage hours required by your CallPilot system.

Worksheet

Complete the following worksheet to determine the number of hours of storage your CallPilot system requires. The procedures on the following pages should help you complete the worksheet.

Storage hours required

			Hours of storage
1	**Message storage time**	**1**	
2	**Personal verification storage time**	**2**	
3	**Greeting storage time**	**3**	
4	**Recorded PDL titles storage time**	**4**	
5	**Fax storage time**	**5**	
6	**Add lines 1 through 5.**	**6**	
7	Storage hours for prompts	**7**	
8	Storage for fax pages	**8**	
9	Add lines 7 and 8.	**9**	
10	**Add lines 6 and 9 to determine the total storage hours.**	**10**	

Determining the mailbox storage requirements

Introduction

The number of hours required for storage of messages and personal verifications is determined from the number of mailbox users and how many minutes of storage each user requires.

For those mailboxes that support fax messaging, additional storage should be provided depending on the number of pages of fax that each user requires.

To determine the voice message storage time

1. Estimate the total number of mailbox users.
2. Estimate the average number of minutes of storage each user requires. The minimum storage time that is allowed per user is 1 minute. If each user uses an average of 10 minutes of storage time and the average message length is 30 seconds, then approximately 20 messages can be stored per user.
3. Multiply the result of step 1 by the result of step 2.
4. Multiply the result of step 3 by 1.2 (to add a 20% safety margin).
5. Divide by 60 to convert the storage time to hours.
6. Record the result in box 1 of the worksheet.

To determine personal verification storage time

1. Assume approximately 3.5 seconds per personal verification.
2. Multiply the result of step 1 by the estimated number of mailbox users.
3. Divide the result of step 2 by 60 to convert the storage time to hours. Therefore, if there are 1000 mailbox users, required storage time is 1000 x 3.5 = 3500 seconds or approximately 1.0 hour.
4. Record the result in box 2 of the worksheet.

To determine the personal greeting storage hours

1. Assume 3 greetings (internal, external, and temporary), each approximately 10 seconds long, for a total of 30 seconds per user.
2. Multiply the result of step 1 by the estimated number of mailbox users.
3. Divide the result of step 2 by 60 to convert the storage time to hours. For example, if there are 1000 mailbox users, required storage time is 1000 x 30 = 30 000 seconds or approximately 8.3 hours.
4. Record the result in box 3 of the worksheet.

To determine the PDL title storage hours

1. Estimate approximately 3.5 seconds per recorded PDL title. Although a user can create up to 99 PDL titles, a typical user has only a few. Estimate approximately 2 recorded PDL titles per user for a total of 7 seconds per user.
2. Multiply the result of step 1 by the estimated number of mailbox users.
3. Divide the result by 60 to convert the storage time to hours. For example, if there are 1000 mailbox users, required storage time is 1000 x 7.0 = 7000 seconds or approximately 2.0 hours.
4. Record the result in box 4 of the worksheet.

To determine the fax messaging storage time

1. Estimate the total number of fax messaging users.
2. Estimate the number of fax pages each user requires. For example, if the average message size is 3 pages, and if users have up to 10 fax messages, 30 fax pages are required per user.
3. Multiply the result of step 2 by 0.3 to convert fax pages to the equivalent minutes of storage. If you are accepting fine resolution messages at your site, use 0.6 as the conversion factor.
4. Multiply the result of step 1 by step 3 to get the total number of minutes of storage required.
5. Divide by 60 to convert to hours of storage.
6. Record the result in box 5 of the worksheet.

To calculate the total hours of storage required for mailboxes

Add the storage times from the above three procedures and record the result in box 6 of the worksheet.

Calculating storage hours for Application Builder

Introduction

Application Builder applications can contain both voice and fax media and are stored in the same volume as users' mailboxes.

Since there is no limit on the amount of data that can be in an application, you should estimate the number of application prompts and the number of fax pages.

To estimate the number of prompts

1. Estimate the average number of prompts you plan to have in an application.
2. Multiply the result by the number of applications you estimate you will have on your CallPilot system.
3. Record the result on line 7 of the worksheet.

To determine the fax storage hours

1. Estimate the total number of normal resolution fax pages you plan to have in an application.
2. Multiply the result of step 1 by 0.3 to get the total number of minutes of storage required.
3. Estimate the total number of fine resolution fax pages you plan to have in an application.
4. Multiply the result of step 3 by 0.6 to get the total number of minutes of storage required.
5. Add the totals from steps 2 and 4 to get the total fax storage requirements in minutes.
6. Multiply the totals by the number of applications you estimate you will have on your CallPilot system.
7. Divide the storage time by 60 to convert to hours of storage.

8 Record the result on line 8 of the worksheet.

To calculate the total hours of storage required for Application Builder

Add the storage hours calculated above to obtain the total storage hours for Application Builder applications. Record the result in line 9 of the worksheet.

Section G: Calculating system size

In this section

Before you calculate your system size 140
Calculating your system size 141

Before you calculate your system size

Introduction

Before you calculate the required system size, familiarize yourself with the following disk space guidelines.

Disk volume VS1

All systems have a disk volume VS1 (Volume Server 1). This volume is used for personal verifications, messages, and Application Builder voice and fax media.

If the hours of storage available on VS1 are enough to satisfy the expected requirements, then the above-mentioned data can be stored on VS1.

User volumes

If all of the personal verifications, messages, and Application Builder voice and fax media cannot fit on VS1, then any additional messages and Application Builder data can be stored on hard drives VS102 and VS103.

Calculating your system size

Introduction

At this point, you should have calculated

- the number of channels required for voice processing
- the number of storage hours required for messages and Application Builder

Note: The storage space required for voice prompts is part of the CallPilot package and, therefore, is not counted in the storage hours figures.

To calculate the system size

Refer to the following table to determine the size of system you require:

Server platform	Number of disks	Number of storage hours	Maximum number of channels
200i (IPE)	1	200	24
201i (IPE)	1	200	24
702t (tower)	3	1000	96
1001rp (rackmount)	3	1000	96

Chapter 5

Engineering the server

In this chapter

Understanding the 200i server capacities 144

Understanding the 201i server capacities 146

Understanding the 702t server capacities 149

Understanding the 1001rp server capacities 152

Understanding the 200i server capacities

Introduction

You should be familiar with the capacities of the 200i server to ensure your selection meets the requirements of your site.

Platform capacities

The 200i server is limited in the number of voice, fax, and speech recognition channels it can support, as well as in the number of mailboxes. The following table summarizes the capacities of each server:

Platform feature	Limits
Storage hours	200
Number of voice channels	24
Number of fax channels	12
Number of speech-recognition channels	6
Number of mailboxes	8000
Number of voice prompt languages	6
Number of speech recognition languages	3
Number of Desktop Messaging mailboxes	1000
RAID (Level 1, hardware, mirroring only)	Not supported
Disks	Not hot-swappable Not redundant

Switch connectivity

The 200i server provides a maximum of 24 channels through the server connection to the Option 11C or Meridian 1 IPE shelf backplane. Both servers occupy two slots.

From the switch perspective, the 200i server appears logically equivalent to one XDLC.

DSP configurations

The server contains one embedded DSP providing support for eight channels. Twenty-four channels are supported by inserting two MPC-8 cards into the server's faceplate. (Each MPC-8 card provides eight channels.)

Disk and volume capacities

There is one system volume (VS1) on each CallPilot server, and it is always found on the system disk. VS1 contains system prompts, user personal verifications, network message queues, and user mailboxes.

The 200i server supports a single IDE hard drive. The following table identifies the disk size and storage capacity for each server:

Platform	Hours of storage
200i	200

Data port provisioning

Only one COM port is available on the 200i server (identified as COM1). You can use it for remote support, download of Reporter data, or operation of MAT.

Connection to the COM port is provided by a 9-pin RS-232 connector as follows:

- 200i server: on the external I/O breakout panel

Neither server has a parallel port. In contrast to the other CallPilot servers, the dongle is embedded on the motherboard.

Understanding the 201i server capacities

Introduction

You should be familiar with the capacities of the 201i server to ensure your selection meets the requirements of your site.

Platform capacities

The 201i server is limited in the number of voice, fax, and speech recognition channels it can support, as well as in the number of mailboxes. The following table summarizes the capacities of each server:

Platform feature	Limits
Storage hours	200
Number of voice channels	24
Number of fax channels	12
Number of speech-recognition channels	6
Number of mailboxes	8000
Number of voice prompt languages	6
Number of speech recognition languages	3
Number of Desktop Messaging mailboxes	1000
RAID (Level 1, hardware, mirroring only)	Not supported
Disks	Not hot-swappable Not redundant

Switch connectivity

The 201i server provides a maximum of 24 channels through the server connection to the Option 11C or Meridian 1 IPE shelf backplane. Both servers occupy two slots.

From the switch perspective, the 200i server appears logically equivalent to one XDLC. The 201i server appears as two MGate cards.

DSP configurations

The server contains one embedded DSP providing support for eight channels. Twenty-four channels are supported by inserting two MPC-8 cards into the server's faceplate. (Each MPC-8 card provides eight channels.)

Note: The 201i server provides four MPC-8 card slots. However, only two are supported in this release.

Disk and volume capacities

There is one system volume (VS1) on each CallPilot server, and it is always found on the system disk. VS1 contains system prompts, user personal verifications, network message queues, and user mailboxes.

The 201i server supports a single IDE hard drive. The following table identifies the disk size and storage capacity for each server:

Platform	Hours of storage
201i	200

Data port provisioning

Only one COM port is available on the 201i server (identified as COM1). You can use it for remote support, download of Reporter data, or operation of MAT.

Connection to the COM port is provided by a 9-pin RS-232 connector as follows:

- 201i server: on the multi I/O cable

Neither server has a parallel port. In contrast to the other CallPilot servers, the dongle is embedded on the motherboard.

Understanding the 702t server capacities

Introduction

You should be familiar with the capacities of the 702t server to ensure they meet the requirements of your site.

Platform capacities

The 702t server is limited in the number of voice, fax, and speech recognition channels it can support as well as the number of mailboxes. The following table summarizes the capacities of the server:

Platform feature	Limit
Storage hours	1000
Number of voice channels	96
Number of fax channels	48
Number of speech-recognition channels	24
Number of mailboxes	20 000
Number of storage hours for services	1000
Number of voice prompt languages	6
Number of speech recognition languages	3
Number of Desktop Messaging mailboxes	5000
RAID (Level 1, hardware, mirroring only)	Supported (optional)
Disks	Not hot-swappable Redundant (optional)
Power supply, fans	Not redundant or hot-swappable

MPC-8 cards and MPB-16 carrier boards

The 702t server supports the MPB-16 carrier board, which has two onboard MPC-8 sections. There are four additional slots on the board into which you can insert a total of 4 MPC-8 cards for a total of 48 channels per carrier board. You can insert a maximum of two carrier boards into the server.

A single carrier board provides two DS30x connections, each of which is connected to an MGate card in the switch. Each MGate card provides 32 channels. Therefore, for 96 channels, you require three MGate cards.

Number of disks

The following table shows the recommended size of the hard drives available for the different storage configurations:

Hours of storage	Disk 1 (Gbyte)	Disk 2 (Gbyte)	Disk 3 (Gbyte)
up to 1000	4	4	4

Volume capacities

There is one system volume (VS1) on each CallPilot server, and it is always found on the system disk. User volumes VS102 and VS103 are placed on separate hard drives that are configured on the server. The following table shows the recommended number of mailboxes available for the different storage configurations:

Volume	Storage hours	Maximum number of mailboxes
VS1	200	8000
VS102	600	18 000
VS103	1000	20 000

Data port provisioning

On the 702t server, the parallel port is dedicated to the dongle, a keycode security device.

There are two serial ports, one of which is used to support an external modem. The other port is retained as a spare.

LAN connectivity

You can install one Ethernet card or one Token Ring card in the 702t server. The following cards are supported:

- 10/100 Mbps PCI Ethernet card
- PCI Token Ring card
- ISA 10 Mbps Ethernet card
- ISA Token Ring card

Understanding the 1001rp server capacities

Introduction

You should be familiar with the capacities of the 1001rp server to ensure they meet the requirements of your site.

Platform capacities

The 1001rp server is limited in the number of voice, fax, and speech recognition channels it can support, as well as in the number of mailboxes. The following table summarizes the capacities of the server:

Platform feature	Limit
Storage hours	1000
Number of voice channels	96
Number of fax channels	48
Number of speech-recognition channels	24
Number of mailboxes	20 000
Number of voice prompt languages	6
Number of speech recognition languages	3
Number of Desktop Messaging mailboxes	5000
RAID (Level 1, hardware, mirroring only)	Standard
Disks	Hot-swappable and redundant
Power supply, fans	Redundant Hot-swappable

MPC-8 cards and MPB-16 carrier boards

The 1001rp server supports the single MPB-16 carrier board, which has two onboard MPC-8 sections. There are four additional slots on the board into which you can insert a total of four MPC-8 cards for a total of 48 channels per carrier board. You can insert a maximum of two carrier boards into the server.

A single carrier board provides two DS30x connections, each of which is connected to an MGate card in the switch. Each MGate card provides 32 channels. Therefore, for 96 channels, you require three MGate cards.

Number of disks

The following table shows the recommended size of the hard drives available for the different storage configurations:

Hours of storage	Disk 1 (Gbyte)	Disk 2 (Gbyte)	Disk 3 (Gbyte)
up to 1000	4	4	4

Volume capacities

There is one system volume (VS1) on each CallPilot server, and it is always found on the system disk. You can find user volumes VS102 and VS103 on separate hard drives that are configured on the server. The following table shows the recommended number of mailboxes available for the different storage configurations:

Volume	Storage hours	Maximum number of mailboxes
VS1	200	8000
VS102	600	18 000
VS103	1000	20 000

Data port provisioning

On the 1001rp server, the parallel port is dedicated to the dongle, a keycode security device.

There are two serial ports, one of which is used to support an external modem. The other port is retained as a spare.

Chapter 6

Engineering the clients

In this chapter

Overview	156
Section A: Engineering the administrative PC	**157**
System requirements for Reporter	158
System requirements for Application Builder	160
Section B: Engineering the desktop client	**161**
System requirements for the desktop client	162
Section C: Calculating disk space requirements	**165**
To help you determine disk space requirements	166

Overview

Introduction

To help you engineer the client PCs (administrative PC and Desktop Messaging PC), you must understand the LAN connectivity and disk space requirements for both machines. This chapter provides procedures for estimating the disk space requirements and establishing the necessary network connectivity.

Software

CallPilot software contains several software components (for example, Reporter and Application Builder) that are intended to run on administrative PCs connected to a CallPilot server.

The Desktop Messaging software can run on a separate PC that is intended for a mailbox user.

LAN connections

The administrative PC can be connected to both an ELAN or a CLAN.

The Desktop Messaging PC should be connected to a CLAN to ensure a high quality of service for telephony applications on the ELAN.

See also

For more information on the hardware specifications for the administrative and desktop client PCs, refer to Chapter 2, “System configurations.”

Section A: Engineering the administrative PC

In this section

System requirements for Reporter 158
System requirements for Application Builder 160

System requirements for Reporter

Introduction

Reporter is a software program that gives the administrator the ability to produce and print summarized and detailed reports about the use and functionality of the CallPilot system. To produce these reports, operational measurement information is downloaded from the CallPilot server and stored in a local database on the administrative PC.

Storage of operational measurements on the administrative PC

A single administrative PC can store operational measurements from a maximum of 50 servers. A database is created on the administrative PC for each server.

Disk space requirements

Reporter requires disk space on the administrative PC for

- OM data collected from one or more servers
- storage of generated reports
- temporary files created during report generation (approximately 14 Mbytes)

The disk space requirements for the database depend on

- the amount of call traffic received
- the number of days operational measurement data is stored in a database (between 5 and 180 days)
- the number of servers a single PC can access

Note: The database has an upper limit of 550 Mbytes per system. If this limit is exceeded, the number of days that data is stored in the database must be reduced.

For more information on calculating disk space, refer to "To help you determine disk space requirements" on page 166.

LAN requirements

Reporter can be connected to an ELAN or a CLAN. It can also be accessed by a modem using PPP.

System requirements for Application Builder

Introduction

Application Builder is a graphical software program that gives the administrator the ability to create multimedia applications with both voice and fax functionality. Callers can access the applications by dialing telephone numbers.

Disk space requirements

Application Builder requires disk space on the administrative PC for

- Application Builder software (approximately 20 Mbytes)
- temporary working space while working on an application
- WAV and TIFF-F files that can reside on the PC and be imported into an application

If you want to estimate the amount of disk space that might be required for WAV and TIFF files, use the following measurements:

- 1 minute of WAV = 1 Mbyte
- 1 page of fax = 40 kbytes in normal resolution and 80 kbytes in fine resolution

For more information on calculating disk space, refer to "To help you determine disk space requirements" on page 166.

LAN requirements

Application Builder can be connected to either an ELAN or a CLAN.

Section B: Engineering the desktop client

In this section

System requirements for the desktop client 162

System requirements for the desktop client

Introduction

Desktop Messaging gives mailbox users access to their CallPilot messages from their PC. They can play back or record voice messages on the PC if it is equipped with a sound card and microphone. Users can also choose to use the telephone. They can view fax messages on the PC or print them to a fax machine.

Disk space requirements

The following items require additional disk space and should be included when planning the disk space requirements:

Item	Approximation
Temporary working space	approximately 40 kbytes per page of fax (normal resolution) and 80 kbytes per page of fax (high resolution)
Address Book information	approximately 10 kbytes per 100 users on the system
Saving a local copy of the message to another folder	approximately 40 kbytes per page of fax (normal resolution) and 80 kbytes per page of fax (high resolution) Estimate approximately 960 kbytes per minute of voice in a message.

For more information on calculating disk space, refer to "To help you determine disk space requirements" on page 166.

LAN requirements

The Desktop Messaging client should be connected to the CLAN to ensure a high quality of service for telephony applications on the ELAN.

The Desktop Messaging feature generates approximately 0.047 kbps of LAN traffic per user during the busy hour.

Section C: Calculating disk space requirements

In this section

To help you determine disk space requirements 166

To help you determine disk space requirements

Introduction

A worksheet is provided to help you estimate the amount of disk space you will need on the administrative PC and the Desktop Messaging client to support the CallPilot software and the data downloaded for Reporter.

Worksheet

Use the following worksheet to determine disk space requirements for the client PCs. For an explanation of the boxes shown on the worksheet, refer to “To determine disk space requirements” on page 168.

Client PC disk space required

			Disk space (Mbytes)
1	**CallPilot software** **Note:** Approximately 25 Mbytes of temporary space is required for software installation.	1	125
2	**Reporter data**	2	
	2a Temporary file space	2a	20
	2b Optional space for saving report output	2b	5
	2c Database for each CallPilot system	2c	
3	**Total disk space for administrative PC**	3	
4	**Desktop Messaging client PC**	4	
	4a Software and online guides	4a	
	4b Storage for voice (minutes of voice *1 Mbyte/minute)	4b	
	4c Storage for fax (pages of fax *80 kbytes/page)	4c	
5	**Total disk space for Desktop Messaging client PC**	5	

To determine disk space requirements

1 The amount of space required by the CallPilot OA&M software is estimated to be 125 Mbytes. This includes the following:

- approximately 25 Mbytes of temporary space for software installation
- CallPilot client software
- Application Builder
- Reporter (does not include database)
- online documentation
- Adobe Acrobat Reader (to view the documentation)

2 The amount of space required by Reporter is estimated as follows:

- temporary file space: 20 Mbytes
- optional space for saving Reporter output: 5 Mbytes

The size of the database for each CallPilot system at the customer site is calculated by using the following equations:

824 + (6.05 *Busy Hour CCS) = kbytes of data/day

(Days stored + 1) * kbytes of data/day = Database size

Days stored = the number of days data is to be stored in the database

3 The amount of space required by the Desktop Messaging client is as follows:

- Client software and online guides: 10 Mbytes
- Storage for fax messages is calculated as number of pages of fax in a message multiplied by 80 kbytes per page.
- Storage for voice messages is calculated as number of minutes in the message multiplied by 1 Mbyte per minute.

Reporter download sizes

The following table shows sample Reporter download sizes on a daily basis. Use this table when calculating the busy hour CCS in step 2:

Channels	Busy hour CCS	kbytes of data/day
12	274	2482
24	652	4769
36	1049	7170
48	1455	9627
60	1867	12 159
72	2282	14 630
84	2630	16 736
96	3120	19 700

Example for estimating disk space requirements

The following example uses the worksheet to calculate the disk space requirements for a customer site. An example of the completed worksheet appears on page 171.

Assumptions

The customer requirements are as follows:

- The customer is purchasing CallPilot client software and Desktop Messaging software.
- Two CallPilot systems exist at the customer site. One is a 24-channel system and the other is a 48-channel system. Ten days of storage are required for Reporter data.
- The customer expects to store 10 minutes of voice messages on the Desktop Messaging client PC.
- The customer expects to store 10 pages of fax messages on the Desktop Messaging client PC.

Example

Based on these assumptions, the worksheet on page 171 summarizes the calculations you must perform to determine the disk space requirements for this example.

In this example, the busy hour CCS is calculated by using the table provided in "Reporter download sizes" on page 169.

To calculate the database for the 24-channel system, perform the following calculation:

(10 + 1) * 4769 = 52 459

824 + (6.05 * 652) = 4769 kbytes of data/day

To calculate the database for the 48-channel system, perform the following calculation:

(10 + 1) * 9267 = 105 897

824 + (6.05 * 14552) = 9627 kbytes of data/day

Completed worksheet example

Client PC disk space required

			Disk space
1	**CallPilot software** **Note:** Approximately 25 Mbytes of temporary space is required for software installation.	1	125
2	**Reporter data**	2	
	2a Temporary file space	2a	20
	2b Optional space for saving report output	2b	5
	2c Database for 24-channel system	2c	52
	Database for 48-channel system	2c	106
3	**Total disk space for administrative PC**	3	283
4	**Desktop Messaging client PC**	4	
	4a Software and online guides	4a	10
	4b Storage for voice (minutes of voice *1 Mbyte/minute)	4b	10
	4c Storage for fax (pages of fax *80 kbytes/page)	4c	1
5	**Total disk space for Desktop Messaging client PC**	5	21

Chapter 7

Selecting a site

In this chapter

Overview 174

Understanding space requirements for the CallPilot server 175

CallPilot power supply requirements 178

Environmental specifications for the CallPilot servers 180

Overview

Introduction

This chapter provides guidelines on selecting an appropriate site for your CallPilot system. It describes specific space, power, and environmental requirements to help with your planning activities.

Space requirements

Take into account that the physical space occupied by the CallPilot server, administrative PC, and ELAN equipment is part of your planning activities. This section provides guidelines to help you determine adequate space for the servers.

Power requirements

You must consider the power supply requirements for the CallPilot server as part of your planning activities.

Environmental considerations

Also consider the environmental requirements of the CallPilot servers when planning an adequate location for the servers.

Understanding space requirements for the CallPilot server

Introduction

Take into account that the physical space occupied by the 1001rp server is part of your planning activities. This section provides guidelines for determining that adequate space is provided for the servers.

Space requirements for the 1001rp server

Front and rear access room is required for servicing of rack components. Situate the rack cabinet in an area with enough space for the front and rear cabinet doors to open and close, and allow extra access room for service or removal of any rack-mounted component.

Switch room space planning

When you plan for the incremental space and mounting needed for the CallPilot server and peripherals, you must consider the space required in the switch room.

ELAN

Ensure there is sufficient space for the Ethernet hub and cables.

IPE server

The IPE server occupies two slots in the IPE shelf. You must also ensure there is sufficient space for the following:

- mounting and space
- I/O breakout panel (2001 server)
- multi-I/O cable (201i server)
- modem
- tape drive
- monitor, keyboard, mouse (although these cannot be permanently connected)

Tower server

The tower server is freestanding. The dimensions are

- height: 49.02 cm (19.3 in.)
- chassis width: 21.08 cm (8.3 in.) (10 in. with feet)
- depth: 44.96 cm (17.7 in.)

The clearance is

- front: 21.59 cm (8.5 in.)
- rear: 12.7 cm (5 in.)
- side: 7.62 cm (3 in.)

The weight of a loaded system with six SCSI drives, six populated boards, one CD-ROM drive, one floppy drive, and one tape drive is 22.05 kg (48.50 lbs).

The cable from the tower server to the Meridian 1 IPE shelf is 10 m (33 ft) in length.

You must ensure that there is sufficient space for the following items:

- modem
- monitor
- keyboard
- mouse

Rackmount server

The rackmount server goes into a customer-supplied 47.5 cm (19 in.) shelf. The dimensions are

- height: 31 cm (12.25 in.)
- width:
  - with the rackmount faceplate: 48.3 cm (19 in.)
  - without the rackmount faceplate: 42.88 cm (17 in.)
- depth:
  - server body: 48.3 cm (19 in.)
  - with handles: 53.3 cm (21 in.)

The weight of a loaded system with six SCSI drives, one CD-ROM drive, one floppy drive, and one tape drive is 45.5 kg (92 lbs).

The cable from the rackmount server to the Meridian 1 IPE shelf is 10 m (33 ft) in length.

You must ensure there is sufficient space for the following items:

- modem
- monitor
- keyboard (with integrated mouse track-ball)

Administrative PC

If the administrative PC is connected to the ELAN, it must be 100 m (330 ft) or less from the ELAN hub.

CallPilot power supply requirements

Introduction

You must consider the power supply requirements for the CallPilot server as part of your planning activities. This section defines the requirements.

General requirements

Locate the CallPilot server in an area that is

- not subject to static electricity
- not subject to vibration
- away from a sprinkler system, water, steam, or other liquid-carrying pipes
- physically safe for personnel and equipment
- not subject to electomagnetic interference (EMI)

  Sources of EMI include

  - broadcast stations
  - radar
  - mobile communications
  - high-voltage power lines
  - power tools
  - office machines, such as photocopiers

CallPilot server power requirements

The three types of servers require different power inputs and usage. The following table summarizes the power requirements:

Device	Power input	Power usage
702t	120V AC 240V AC	300 W

Device	Power input	Power usage
1001rp AC	120V AC 240V AC	400 W
1001rp DC	48V, 20 amp DC See the note below.	
200i	provided by the M1 IPE	40 W
201i	provided by the M1 IPE	40 W
ELAN hub	110 V	1.8 W
external tape drive	110 V	7.2 W
MGate card	provided by the M1 IPE	5 W
modem		10 W
monitor	110 VAC	90 W

Note: If you are using the Nortel Networks MFA150 rectifier (which comes with 30 A breakers, two 20 A breakers in the Spare Circuit Breaker Kit, 20 A [P0729846]), it must be configured to supply the two 20 A DC circuits for the rackmount server.

Environmental specifications for the CallPilot servers

Introduction

Consider the environmental requirements of the CallPilot servers when planning an adequate location for the servers.

Note: Switch environment specifications should be considered first before the server environment specifications.

Specifications for the 200i server

The proper temperature and humidity are important for the longevity of the server. The following table summarizes the key specifications:

Parameter	Condition	Specification
Temperature	Recommended temperature	15°C (59°F) to 30°C (86°F)
	Absolute temperature	10°C (50°F) to 45°C (113°F)
	Long-term storage temperature	-20°C (-4°F) to 60°C (140°F)
	Short-term storage temperature	-40°C (-40°F) to 70°C (158°F) (less than 72 hours)
	Change rate temperature	less than 1°C (33.8°F) per three minutes

Parameter	Condition	Specification
Humidity	Recommended relative humidity	20% to 55% RH (non-condensing)
	Absolute relative humidity	20% to 80% RH (non-condensing)
	Long-term storage relative humidity	5% to 95% RH (at -40°C [-40°F] to 70°C [158°F] respectively) (non-condensing)

Specifications for the 201i server

The proper temperature and humidity are important for the longevity of the server. The following table summarizes the key specifications:

Parameter	Condition	Specification
Temperature	Recommended temperature	15°C (59°F) to 30°C (86°F)
	Absolute temperature	10°C (50°F) to 45°C (113°F)
	Long-term storage temperature	-20°C (-4°F) to 60°C (140°F)
	Short-term storage temperature	-40°C (-40°F) to 70°C (158°F) (less than 72 hours)
	Change rate temperature	less than 1°C (33.8°F) per three minutes

Parameter	Condition	Specification
Humidity	Recommended relative humidity	20% to 55% RH (non-condensing)
	Absolute relative humidity	20% to 80% RH (non-condensing)
	Long-term storage relative humidity	5% to 95% RH (at -40°C [-40°F] to 70°C [158°F] respectively) (non-condensing)

Specifications for the 1001rp server

The proper temperature, humidity, and altitude are important for the longevity of the server. The following table summarizes the key specifications:

Note: The Non-operating label under the Condition column refers to the specification during shipping, storage, or both.

Parameter	Condition	Specification
Temperature	Operating	5°C (41°F) to 35°C (95°F)
	Non-operating	-40°C (-40°F) to 70°C (158°F)
Humidity	Operating	5% to 95% at 40°C (104°F) (non-condensing)
	Non-operating	0% to 95% at 40°C (104°F) (non-condensing)
Shock	Operating	1.25 Gs, 10 ms (10.0 Gs, 11 ms in appropriate chassis)
	Non-operating	30.0 Gs, 10 ms (40.0 Gs, 11 ms in appropriate chassis)

Parameter	Condition	Specification
Vibration	Operating	0.25 Gs at 5 Hz to 100 Hz (1.5 Gs over 5 Hz to 100 Hz in appropriate chassis)
	Non-operating	5 Gs at 5 Hz to 100 Hz
Altitude	Operating	4572 m (15 000 ft)
	Non-operating	15 240 m (50 000 ft)

Appendix A

Traffic capacity tables

In this appendix

Types of traffic capacity tables 186
CCS values and channel requirements table 187

Types of traffic capacity tables

Introduction

When calculating the number of channels you need on your CallPilot system, be aware that there are differences between sizing non-Meridian 1 switches versus Meridian 1 switches. The key differences are identified in “Channel requirements for specific switches” on page 90.

Types of tables to use

The following table identifies the type of table to use for your CallPilot system and switch type. The actual tables begin on page 187.

	Busy hour CCS (BHCCS) traffic capacity table type			
Switch and media type	**Erlang C P.05 BHCCS (40 second AHT)**	**Erlang C P.05 BHCCS (adjust for one MWI channel)**	**Erlang B P.02 BHCCS**	**Erlang B P.02 BHCCS (adjust for one MWI channel)**
Meridian 1 and MSL-100 Voice, Fax, and ASR	✔			
Lucent Voice		✔		
Lucent Fax and ASR	✔			
Mitel, Rolm, Matra Voice				✔
Mitel, Rolm, and Matra Fax and ASR			✔	

CCS values and channel requirements table

Introduction

This section provides traffic capacity tables to use when calculating channel requirements.

Before using this table

To determine which column of the following table to use when calculating channel requirements, refer to “Types of tables to use” on page 186.

CCS values

Number of channels	Erlang C P.05 GOS	Erlang C P.05 (adjusted for one MWI channel)	Erlang B P.02 GOS	Erlang B P.02 (adjusted for one MWI channel)
1	2	< 2	1	< 1
2	14	2	8	1
3	32	14	22	8
4	54	32	40	22
5	77	54	60	40
6	103	77	83	60
7	129	103	106	83
8	156	129	131	106
9	184	156	157	131
10	213	184	183	157
11	242	213	210	183
12	271	242	238	210

CCS values

Number of channels	Erlang C P.05 GOS	Erlang C P.05 (adjusted for one MWI channel)	Erlang B P.02 GOS	Erlang B P.02 (adjusted for one MWI channel)
13	301	271	267	238
14	331	301	295	267
15	362	331	325	295
16	392	362	356	325
17	424	392	386	356
18	455	424	416	386
19	486	455	447	416
20	518	486	477	447
21	550	518	508	477
22	582	550	539	508
23	614	582	570	539
24	646	614	602	570
25	678	646	633	602
26	711	678	665	633
27	744	711	697	665
28	776	744	729	697
29	809	776	761	729
30	842	809	793	761
31	875	842	825	793

CCS values

Number of channels	Erlang C P.05 GOS	Erlang C P.05 (adjusted for one MWI channel)	Erlang B P.02 GOS	Erlang B P.02 (adjusted for one MWI channel)
32	908	875	857	825
33	941	908	890	857
34	974	941	922	890
35	1008	974	955	922
36	1041	1008	987	955
37	1074	1041	1020	987
38	1108	1074	1053	1020
39	1141	1108	1086	1053
40	1175	1141	1119	1086
41	1209	1175	1152	1119
42	1242	1209	1185	1152
43	1276	1242	1218	1185
44	1310	1276	1252	1218
45	1344	1310	1285	1252
46	1378	1344	1318	1285
47	1412	1378	1352	1318
48	1445	1412	1385	1352
49	1479	1445	1418	1385
50	1513	1479	1452	1418

CCS values

Number of channels	Erlang C P.05 GOS	Erlang C P.05 (adjusted for one MWI channel)	Erlang B P.02 GOS	Erlang B P.02 (adjusted for one MWI channel)
51	1548	1513	1486	1452
52	1582	1548	1519	1486
53	1616	1582	1553	1519
54	1650	1616	1587	1553
55	1684	1650	1620	1587
56	1718	1684	1654	1620
57	1753	1718	1688	1654
58	1787	1753	1722	1688
59	1821	1787	1756	1722
60	1856	1821	1790	1756
61	1890	1856	1824	1790
62	1924	1890	1858	1824
63	1959	1924	1892	1858
64	1993	1959	1926	1892
65	2028	1993	1960	1926
66	2062	2028	1994	1960
67	2097	2062	2028	1994
68	2131	2097	2063	2028
69	2166	2131	2097	2063

CCS values

Number of channels	Erlang C P.05 GOS	Erlang C P.05 (adjusted for one MWI channel)	Erlang B P.02 GOS	Erlang B P.02 (adjusted for one MWI channel)
70	2200	2166	2131	2097
71	2235	2200	2165	2131
72	2269	2235	2200	2165
73	2304	2269	2234	2200
74	2339	2304	2268	2234
75	2373	2339	2303	2268
76	2408	2373	2337	2303
77	2443	2408	2372	2337
78	2477	2443	2406	2372
79	2512	2477	2441	2406
80	2547	2512	2475	2441
81	2582	2547	2510	2475
82	2616	2582	2544	2510
83	2651	2616	2579	2544
84	2686	2651	2613	2579
85	2721	2686	2648	2613
86	2756	2721	2682	2648
87	2791	2756	2717	2682
88	2825	2791	2752	2717

CCS values

Number of channels	Erlang C P.05 GOS	Erlang C P.05 (adjusted for one MWI channel)	Erlang B P.02 GOS	Erlang B P.02 (adjusted for one MWI channel)
89	2860	2825	2786	2752
90	2895	2860	2821	2786
91	2930	2895	2856	2821
92	2965	2930	2891	2856
93	3000	2965	2925	2891
94	3035	3000	2960	2925
95	3070	3035	2995	2960
96	3105	3070	3030	2995

Appendix B

Planning spares requirements

In this appendix

Planning spares for the CallPilot servers 194

200i server spares 195

201i server spares 197

702t server spares 200

1001rp server spares 204

Switch connectivity spares (tower and rackmount platforms) 208

IPE distributor support kits 210

Planning spares for the CallPilot servers

Introduction

This section lists the parts and assemblies that can be ordered for replacement and spares. It also shows the estimated Annual Failure Rate (AFR) in percentage.

Note: When ordering a replacement dongle, you must also include the ordering code for an Upgrade (NTZE4002 A0809123).

Definition: Annual Failure Rate

The AFR is the percentage of the parts that are expected to fail in a year. The following formula converts AFR to a Mean Time Between Failure (MTBF):

MTBF (years) = 1 / AFR %

Example

If the AFR % is 2%, then the MTBF = 1 / .02 = 50 years.

200i server spares

Component	CPC	PEC	AFR %
Base system	A0641449	NTRH14AA	2
Hard drive power cable	P0684414	P0684414	–
4 Gbyte IDE hard drive	A0731186	NTRH9049	2
128 Mbyte DIMM	A0738130	A0738130	2
Hard drive data cable	A0661097	NTRH16BA	–
Option 11 SCSI cable	A0767359	NTRH1407	–
Meridian 1 faceplate SCSI cable	A0769733	NTRH1408	–
Meridian 1 bulkhead SCSI cable	A0769774	NTRH1409	–
4.3 m (14 ft) shielded Ethernet cable	A0769310	A0769310	–
200i breakout panel assembly	**A0688377**	**NTRH09AA**	**–**
1.8 m (6 ft) breakout panel interconnect cable	A0726955	NTRH0910	–
4.6 m (15 ft) breakout panel interconnect cable	A0765601	NTRH0911	
CLAN Token Ring connection kit	**A0739898**	**NTUB51AA**	**1**
Token Ring adapter PCMCIA	A0683742	NTRH9040	1
Token Ring cabling	A0742083	NTRH1406	–
CLAN Ethernet connection kit	**A0739900**	**NTUB52AA**	**1**
Ethernet adapter PCMCIA	A0683741	NTRH9039	1
Internal Ethernet cabling	A0730304	NTRH1405	–

Component	CPC	PEC	AFR %
External SCSI 4-Gbyte tape drive kit	**A0739901**	**NTUB53AA**	**1**
External SCSI tape drive (4 Gbytes)	A0683740	NTRH9038	1
SCSI cable	A0372864	NTAK1305	–
Data cartridge	A0780247	A0780247	3
SCSI adapter	A0769312	A0769312	–
Cleaning cartridge	A0627875	A0627875	3
Recovery kit	**A0739902**	**NTUB54AA**	**1**
CD-ROM kit	A0744832	NTUB59AA	1
MAS flash recovery PC card	A0744464	NTRH9055	1
Monitor peripheral kit	**A0739905**	**NTUB56AA**	**0.2**
14" monitor	A0663896	NTRH9011	0.2
Keyboard	A0993898	NTRH9013	0.2
Mouse	A0663899	NTRH9014	0.2

201i server spares

Component	CPC	PEC	AFR %
201i server base hardware	**–**	**–**	**–**
201i server	A0774802	NTRH30AA	2
CallPilot 1.07 keycode package	A0805067	NTUB14AC	–
ATA66 hard drive	A0822235	A0822235	–
MPC-8	A0639034	NTRH01AA	2
Hardware accessories	**–**	**–**	**–**
10BaseT hub	A0663902	NTRH9017	0.5
10BaseT transceiver MAU	A0795886	NTRH9069	0.5
Option 11 SCSI cable	A0767359	NTRH1407	–
Meridian 1 faceplate SCSI cable	A0769733	NTRH1408	–
Multi I/O cable - dual Ethernet	A0789694	NTRH0912	NA
Meridian 1 unfiltered ring/tip cable	A0812878	NTRH3501	–
Meridian 1 bulkhead SCSI cable	A0827498	NTRH1410	–
14 ft shielded Ethernet cable	A0769310	A0769310	–
Base server software	**A0811164**	**NTUB20AD**	**–**
Windows NT 4.0 OS Recovery CD-ROM	A0744465	NTRH8027	–
CallPilot Master Driver CD-ROM Bootable	A0811040	NTRH8101	–
CallPilot 1.07 Server Software CD-ROM	A0805235	NTUB40AC	–

Component	CPC	PEC	AFR %
CallPilot 1.07 Admin Client CD-ROM	A0795747	NTUB41AC	–
CallPilot 1.07 Desktop Messaging CD-ROM	A0805370	NTUB42AC	–
CallPilot 1.07 PEP Software CD-ROM	A0805372	NTUB43AC	–
CallPilot 1.07 Language Prompts CD-ROM	A0811170	NTUB44BC	–
CallPilot 1.07 Web Messaging CD-ROM	A0805374	NTUB45AC	–
External SCSI 4 Gbyte tape drive kit	**A0739901**	**NTUB53AA**	**1**
External SCSI tape drive	A0683740	NTRH9038	–
External SCSI tape drive cable	A0820829	NTRH3502	–
Data cartridge	A0780247	A0780247	–
SCSI adapter	A0769312	A0769312	3
Cleaning cartridge	A0627875	A0627875	3

Component	CPC	PEC	AFR %
CD-ROM Kit	**A0744832**	**NTUB59AA**	**1**
Hardware assembly—portable CD-ROM drive	A0683739	NTRH9037	1
External SCSI drive cable	A0820829	NTRH3502	–
Monitor peripheral kit	**A0739905**	**NTUB56AA**	**0.2**
14" monitor	A0663896	NTRH9011	0.2
Keyboard	A0993898	NTRH9013	0.2
Mouse	A0663899	NTRH9014	0.2
Modem kit	**A0744831**	**NTUB16AA**	**1**
Modem	A0663901	NTRH9016	1
Modem cabling	A0601464	A0601464	–
Ethernet cables	**–**	**–**	**–**
.6 m (2 ft) Ethernet cable	A0648374	A0648374	–
1.25 m (4 ft) Ethernet cable	A0648372	A0648372	–
2.1 m (7 ft) Ethernet cable	A0648375	A0648375	–
3 m (10 ft) Ethernet cable	A0648377	A0648377	–
4.6 m (15 ft) Ethernet cable	A0648378	A0648378	–
7.7 m (25 ft) Ethernet cable	A0648379	A0648379	–

702t server spares

Component	CPC	PEC	AFR %
702t base hardware package	**–**	**–**	**–**
300 W power supply	A0741561	A0741561	1.5
Fan module assembly	A0741576	A0741576	0.5
Floppy drive	A0662019	NTRH9004	0.5
Floppy cable	A0741572	A0741572	–
IDE CD-ROM drive	A0680752	NTRH9035	0.5
IDE cable to CD-ROM	A0806019	A0806019	–
Pentium II 450 Mhz CPU (2)	A0761148	A0761148	0.6
128 Mbyte DIMM (2)	A0744456	A0744456	2
9 Gbyte SCSI disk (3)	A0741778	NTRH9054	2
Wide SCSI cable	A0788129	A0788129	–
Wide SCSI terminator	A0766997	A0766997	–
9 drop SCbus cable	A0788131	A0788131	–
Dongle adapter	A0731666	A0731666	0.2
CallPilot 1.07 keycode package	A0805067	NTUB14AC	–
7.7 m (25 ft) Ethernet cable	A0648379	A0648379	–
Base server software	**A0811166**	**NTUB22AD**	**–**
Emergency Repair Disk (blank)	A0682962	NT3R9501	–
Windows NT 4.0 Install Diskettes	A0747562	NTRH8033	–

Component	CPC	PEC	AFR %
Windows NT 4.0 OS Recovery CD-ROM	A0744465	NTRH8027	–
CallPilot Master Driver CD-ROM Bootable	A0811040	NTRH8101	–
CallPilot 1.07 Server Software CD-ROM	A0805235	NTUB40AC	–
CallPilot 1.07 Admin Client CD-ROM	A0795747	NTUB41AC	–
CallPilot 1.07 Desktop Messaging CD-ROM	A0805370	NTUB42AC	–
CallPilot 1.07 PEP Software CD-ROM	A0805372	NTUB43AC	–
CallPilot 1.07 Language Prompts CD-ROM	A0811170	NTUB44BC	–
CallPilot 1.07 Web Messaging CD-ROM	A0805374	NTUB45AC	–
Internal tape drive kit	**A0739904**	**NTUB55AA**	**1**
Tape drive	A0678778	NTRH9034	1
Cleaning cartridge	A0677506	A0677506	3
Data cartridge	A0677508	A0677508	3
M/M Wide-Nar SCSI adapter	A0729069	A0729069	–
F/F Wide-Nar SCSI adapter	A0684822	A0684822	–
Twisted wide SCSI cable	A0788129	A0788129	–
Wide SCSI terminator	A0766997	A0766997	–

Component	CPC	PEC	AFR %
700 series RAID kit	**A0739908**	**NTUB58AA**	**1**
SCSI RAID controller	A0833400	NTRH9076	2
9 Gbyte SCSI disk (3)	A0741778	NTRH9054	2
Wide SCSI cable	A0788129	A0788129	–
Wide SCSI terminator	A0766997	A0766997	–
Modem kit	**A0744831**	**NTUB16AA**	**1**
Modem	A0663901	NTRH9016	1
Modem cabling	A0601464	A0601464	–
Monitor peripheral kit	**A0739905**	**NTUB56AA**	**0.2**
14" monitor	A0663896	NTRH9011	0.2
Keyboard	A0993898	NTRH9013	0.2
Mouse	A0663899	NTRH9014	0.2
General parts	**–**	**–**	**–**
Meridian Mail to CallPilot Migration Tape (S/W)	A0805432	NTUB24AB	–
MPC-8	A0639034	NTRH01AA	2
MPB16-4 DSP carrier card (512TS)	A0765614	NTRH20AB	2
MPB16-4 DSP carrier card (1024TS) (MSL-100 only)	A0772417	NTRH20BA	2
100BaseT Ethernet adapter	A0680753	NTRH9036	0.2
Token Ring adapter PCI	A0663895	NTRH9010	0.2

Component	CPC	PEC	AFR %
10BaseT hub	A0663902	NTRH9017	0.5
10BaseT transceiver MAU	A0795886	NTRH9069	0.5
700 Series DC power converter	A0673987	NTRH9032	0.2
Ethernet cables	**–**	**–**	**–**
.6 m (2 ft) Ethernet cable	A0648374	A0648374	–
1.25 m (4 ft) Ethernet cable	A0648372	A0648372	–
2.1 m (7 ft) Ethernet cable	A0648375	A0648375	–
3 m (10 ft) Ethernet cable	A0648377	A0648377	–
4.6 m (15 ft) Ethernet cable	A0648378	A0648378	–
7.7 m (25 ft) Ethernet cable	A0648379	A0648379	–

1001rp server spares

Component	CPC	PEC	AFR %
AC and DC platform spares	**–**	**–**	**–**
Hot-swappable fan	A0681326	A0681326	0.5
Alarm status module	A0681164	A0681164	0.2
Rack rails	A0797941	A0797941	–
Floppy drive	A0662019	NTRH9004	0.5
256 Mbyte SDRAM	A0813446	A0813446	2
9 Gbyte disk—hot swappable (6)	NTRH9053	A0741777	2
IDE CD-ROM drive	A0680752	NTRH9035	0.5
Video card adapter	A0683743	NTRH9041	0.2
100BaseT Ethernet adapter	A0680753	NTRH9036	0.2
SCSI RAID controller	A0663892	NTRH9007	2
Twisted wide SCSI cable	A0788129	A0788129	–
9 drop SCbus cable	A0788131	A0788131	–
Dongle adapter	A0731666	A0731666	0.2
7.7 m (25 ft) Ethernet cable	A0648379	A0648379	–
CallPilot 1.07 keycode package	A0805067	NTUB14AC	
AC rackmount platform spares	**–**	**–**	**–**
500 W AC power supply (2)	A0805434	A0805434	1.5

Component	CPC	PEC	AFR %
DC rackmount platform spares	**–**	**–**	**–**
300 W DC power supply	A0723663	A0723663	1.5
DC power cord	A0725949	A0725949	–
PDU	A0676108	A0676108	–
Dual Pentium III SBC	**A0793321**	**NTRH9068**	**2**
Floppy cable	A0685305	A0685305	–
Cable harness for first and second serial ports	A0826698	A0826698	–
IDE cable to CD-ROM	A0806019	A0806019	–
Base server software	**A0811166**	**NTUB22AD**	**–**
Emergency Repair Disk (blank)	A0682962	NT3R9501	–
Windows NT 4.0 Install Disk	A0747562	NTRH8033	–
Windows NT 4.0 OS Recovery CD-ROM	A0744465	NTRH8027	–
CallPilot Master Driver CD-ROM Bootable	A0811040	NTRH8101	–
CallPilot 1.07 Server Software CD-ROM	A0805235	NTUB40AC	–
CallPilot 1.07 Admin Client CD-ROM	A0795747	NTUB41AC	–
CallPilot 1.07 Desktop Messaging CD-ROM	A0805370	NTUB42AC	–
CallPilot 1.07 PEP Software CD-ROM	A0805372	NTUB43AC	–

Component	CPC	PEC	AFR %
CallPilot 1.07 Language Prompts CD-ROM	A0811170	NTUB44BC	–
CallPilot 1.07 Web Messaging CD-ROM	A0805374	NTUB45AC	–
Internal tape drive kit	**A0739904**	**NTUB55AA**	**1**
Tape drive	A0678778	NTRH9034	1
Cleaning cartridge	A0677506	A0677506	3
Data cartridge	A0677508	A0677508	3
M/M Wide-Nar SCSI adapter	A0729069	A0729069	–
F/F Wide-Nar SCSI adapter	A0684822	A0684822	–
Twisted wide SCSI cable	A0788129	A0788129	–
Wide SCSI terminator	A0766997	A0766997	–
Modem kit	**A0744831**	**NTUB16AA**	**1**
Modem	A0663901	NTRH9016	1
Modem cabling	A0601464	A0601464	–
General parts	**–**	**–**	**–**
14" monitor	A0663896	NTRH9011	0.2
Keyboard	A0726973	NTRH9048	0.2
MPC-8	A0639034	NTRH01AA	2
MPB16-4 DSP carrier card (512TS)	A0765614	NTRH20AB	2
MPB16-4 DSP carrier card (1024TS) (MSL-100 only)	A0772417	NTRH20BA	2
Token Ring adapter PCI	A0663895	NTRH9010	0.2

Component	CPC	PEC	AFR %
100BaseT Ethernet adapter	A0680753	NTRH9036	0.2
10BaseT transceiver MAU	A0795886	NTRH9069	0.5
10BaseT hub	A0663902	NTRH9017	0.5
Meridian Mail to CallPilot Migration Tape (S/W)	A0805432	NTUB24AB	–
Ethernet cables	**–**	**–**	**–**
.6 m (2 ft) Ethernet cable	A0648374	A0648374	–
1.25 m (4 ft) Ethernet cable	A0648372	A0648372	–
2.1 m (7 ft) Ethernet cable	A0648375	A0648375	–
3 m (10 ft) Ethernet cable	A0648377	A0648377	–
4.6 m (15 ft) Ethernet cable	A0648378	A0648378	–
7.7 m (25 ft) Ethernet cable	A0648379	A0648379	–

Switch connectivity spares (tower and rackmount platforms)

Component	CPC	PEC	AFR %
CallPilot to Lucent (2 Wire) Integration	**A0787958**	**NTZE29BA**	**1**
VTG VB2009	A0774945	NTRH9060	1
30.8 m (100 ft) switch board cable	A0766163	A0766163	–
CallPilot to Siemens/Rolm Integration	**A0787959**	**NTZE29CA**	**1**
VTG VB2002	A0774940	NTRH9057	1
30.8 m (100 ft) switch board cable	A0766163	A0766163	–
CallPilot to Mitel Integration	**A0787960**	**NTZE29DA**	**1**
VTG VB2007	A0774944	NTRH9059	1
30.8 m (100 ft) switch board cable	A0766163	A0766163	–
CallPilot to Meridian 1 Integration	**A0787957**	**NTZE29AA**	**1**
Mgate card	A0767356	NTRB18CA	1
MGate dual connect cable	A0767358	NTRH2013	–
Single DS30XV interconnect cable	A0767357	NTRH2012	–
CallPilot to Matra Integration Kit	**A0806050**	**NTZE29GA**	**2**
MPC-8 (2)	A0639034	NTRH01AA	2
MPB16-2T carrier card	A0804626	NTRH21CA	2
Analog loop start cable	A0790467	NTRH0914	–

Component	CPC	PEC	AFR %
CallPilot to Nortel Networks SL-100 Integration	**A0787961**	**NTZE29EA**	**1**
Dialogic DT1/480SC DualSpan T1	A0788895	NTRH9065	1
T1 cable	A0788107	A0788107	–
Modem for SMDI link in T1 application	A0620530	A0620530	0.2
Modem cabling	A0601464	A0601464	–
VTG adapter cable	A0788198	A0788198	–
9 drop SCbus cable (used for DSE connectivity kit)	A0788131	A0788131	–
CT to CT bus cable (used for NTZE29GA kit)	A0790468	NTRH0915	–

IPE distributor support kits

Introduction

This section identifies the hardware distributors use to install, support, and recover CallPilot IPE systems.

Description	CPC	PEC	AFR %
Recovery kit (200i server only)	**A0739902**	**NTUB54AA**	**1**
CD-ROM kit	A0744832	NTUB59AA	1
MAS flash recovery PC card	A0744464	NTRH9055	1
Monitor peripheral kit	**A0739905**	**NTUB56AA**	**0.2**
14" monitor	A0663896	NTRH9011	0.2
Keyboard	A0993898	NTRH9013	0.2
Mouse	A0663899	NTRH9014	0.2

Notes:

- The 201i server contains a read-only disk operating system (ROM-DOS) that enables you to perform a system recovery and build. For more details, refer to *Part 5: 201i Server Maintenance and Diagnostics* in the *CallPilot 201i Installation and Configuration Guide*.
- The monitor kit (monitor, mouse, and keyboard) is needed only for initial installation of the IPE platform. To conform with EMI regulations, remove it after installation.

Appendix C

Component list

For component lists for each CallPilot server platform, refer to the *Models and Ordering Procedures* product bulletin.

To obtain this document, contact your Nortel Networks distributor. If you are a Nortel Networks distributor, you can obtain this document from the CallPilot area of the Nortel Networks Information Center web site at http://www.nortel.com/partnercenter/.

Appendix D

Site survey checklist

In this appendix

Planning your CallPilot system using a site survey checklist 214

Planning your CallPilot system using a site survey checklist

To plan for a CallPilot system

Use the following checklist to help you plan for a CallPilot system:

1. General information

End User

Name: _____

Address: _____

City, State/Province: _____

Country, Zip/Postal Code: _____

Telephone number: _____

Primary contact: _____

Secondary contact: _____

Distributor

Name: _____

Address: _____

City, State/Province: _____

Country, Zip/Postal Code: _____

Telephone number: _____

Primary contact: _____

Secondary contact: _____

2. Delivery information

City, State/Province: _____

Country, Zip/Postal Code: _____

Telephone number: _____

Primary contact: _____

Secondary contact: _____

Vehicle restrictions: _____

Hours of delivery: _____

Security clearance: _____

Freight company: _____

Delivery constraints: _____

3. Switch configuration

Meridian 1 model (see below for other types of switches): _____

Meridian 1 serial number: _____

Memory (check one):

❒ 24 Mbytes ❒ 80 Mbytes

❒ 48 Mbytes ❒ 96 Mbytes

❒ 64 Mbytes ❒ 112 Mbytes

Average Real-Time Utilization: _____%

Over a period of hours, days, weeks, or months: _____

MSL-100 model: _____

MSL-100 serial number: _____

Lucent model: _____

Matra model: _____

Rolm model: _____

Mitel model: _____

Current software release: _____

4. CallPilot system sizing considerations
(Refer to Chapter 4, "Determining system size," in this guide for the following information.)

Number of channels required (voice, fax, and speech recognition): _____

Number of MPC-8 cards required: _____

Number of MPB-16 boards required: _____

Number of storage hours required: _____

5. CallPilot optional features desired

Primary language: _____

Secondary language: _____

Extra/alternate language (3): _____

Extra/alternate language (4): _____

Extra/alternate language (5): _____

Extra/alternate language (6): _____

(Contact your Nortel Networks representative for a list of available languages.)

AMIS Networking: ❒ Yes ❒ No

Enterprise networking: ❒ Yes ❒ No

VPIM Networking:	❒ Yes	❒ No
NMS locations:	❒ Yes	❒ No
Application Builder with fax option:	❒ Yes	❒ No
Desktop messaging client:	❒ Yes	❒ No
Fax messaging mailboxes:	❒ Yes	❒ No
Speech recognition mailboxes:	❒ Yes	❒ No

6. Administrative PC and Desktop Messaging clients

Primary individual/group responsible for installation of Desktop Messaging client software:	❒ Distributor ❒ Mailbox user ❒ Customer's Information System department
Primary individual/group responsible for installation of CallPilot software on administrative PC:	❒ Distributor ❒ Customer's Information System department

7. Network changes

IP address of CallPilot server:	_____. _____._____._____.
Subnet mask for CallPilot server on ELAN (Meridian 1 only):	_____. _____._____._____.
IP address for connection of server to CLAN:	_____. _____._____._____.
Primary individual/group responsible for configuring CallPilot server:	❒ Distributor ❒ System administrator ❒ Customer's Information System department

LAN connection for CallPilot:	❒ 10BaseT ❒ 100BaseT	❒ Token Ring 4 Mbps ❒ Token Ring 16 Mbps
When will the CLAN drop for the CallPilot be available?	_____	
Is TCP/IP available from CallPilot server to all administrative and messaging clients?	❒ Yes	❒ No

8. Enter third-party e-mail or GroupWare Messaging system installed:

	Number of users:
❒ e-mail or GroupWare	_____
❒ Microsoft Exchange	_____
❒ Microsoft Outlook97	_____
❒ Lotus Notes	_____
❒ Novell Groupwise	_____
❒ Microsoft Outlook Express (Internet e-mail client)	_____
❒ Netscape Messenger (Internet e-mail client)	_____
❒ Qualcomm Eudora (Internet e-mail client)	_____
❒ Microsoft Outlook 98 (Internet e-mail mode)	_____

Index

Numerics

1001rp server
  data port provisioning 154
  environmental specifications 182
  number of disks 153
  platform capacities 152
  power supply requirements 178
  space requirements 175
  volume capacities 153
200i server
  components 36, 38
  data port provisioning 145, 147
  environmental specifications 180, 181
  platform capacities 144, 146
  power supply requirements 179
201i server
  relative humidity 178
  temperatures 178
702t server
  data port provisioning 151
  platform capacities 149
  power supply requirements 178
  volume capacities 150

A

administrative PC, configuration 49
AMIS Networking 78
AML link 69
Application Builder 74
  disk space requirements 160
  storage requirements 130, 136

B

busy hour
  definition 90
  determining
    Application Builder voice services 99
    fax auto attendant 114
    fax callback activity 113
    fax menu activity 111
    fax messaging activity 116
    voice channels 98

C

callback delivery 106
CallPilot system planning 214
channel requirements
  fax channels, calculating 117
  for Application Builder 74
  for Fax Broadcasting 117
  for Multimedia messaging 82
  for Networking 79
  guidelines for estimating 90
  voice channels, determining 103
channel, definition 88
client PC
  components 35, 37, 39
  disk space requirements, determining 166
  LAN connections
    156
components in a CallPilot system 22
configuration
  administrative PC 49
  Desktop Messaging client 52
  IPE platform 36, 38
  rackmount platform 32
  tower platform 32
customer LAN 67

D

Desktop Messaging client
  disk space requirements 162
  e-mail packages supported 29, 55
  for Internet Mail 56
  for Lotus Notes 56
  for Microsoft Exchange/Outlook 56
  for web browsers 56

hardware requirements 55
how to purchase 77
LAN requirements 77
disk space requirements
for Application Builder 160
for Desktop Messaging client 162
for Reporter 158

E

Embedded LAN 60
Enterprise Networking 79

F

fax channels, determining 107
Fax on Demand 111

H

hard disk drive
administrative PC requirements 49
Desktop Messaging client requirements 55
Help, online 25
humidity, 201i server 178

M

Meridian 1 switch 45
Meridian Application Server
components 34, 37, 39
hardware components 42
MPB-16 boards, determining how many are required 128
MPB16-4 carrier board 64, 65
MPC-8 cards
definition 89
MPUs
calculating 127
definition 89
multimedia messaging 81

N

Network Message Service (NMS) Networking 79
networking limits 80

O

online Help 25
outcalling activity 101

P

Personal Distribution List limits 81
planning a CallPilot system 214

R

rackmount platform 32
RAID 144, 146, 149, 152
RAM requirements
for the administrative PC 49
for the Desktop Messaging client 55
related information products 23
relative humidity, 201i server 178
Reporter 76
disk space requirements 158

S

same call delivery 106
Shared Distribution Lists limits 81
speech-recognition channels, determining 123
storage hours, determining 130
storage requirements
for Application Builder 130, 136
for messages 130, 133
switches, supported 45
system size, calculating 141

T

temperatures, 201i server 178
tower platform 32

V

voice channels, determining 94
Volume VS1 140
Volume VS102 140
Volume VS103 140
VPIM Networking 78

W

worksheets
CallPilot system, planning 214
fax channels, determining 109
MPUs, determining 126
speech-recognition channels, determining 122
storage hours, determining 131
voice channels, determining 96

*Nortel Networks, the Nortel Networks logo, the Globemark, and Unified Networks, BNR, CallPilot, DMS, DMS-100, DMS-250, DMS-MTX, DMS-SCP, DPN, Dualmode, Helmsman, IVR, MAP, Meridian, Meridian 1, Meridian Link, Meridian Mail, Norstar, SL-1, SL-100, Supernode, Symposium, Telesis, and Unity are trademarks of Nortel Networks.

ACCENT is a trademark of Accent Software International Ltd.

ACTION REQUEST SYSTEM and AR SYSTEM are trademarks of Remedy Corporation.

AMDEK is a trademark of Amdek Corporation.

ANSI is a trademark of the American National Standards Institute, Inc.

AT&T is a trademark of American Telephone and Telegraph Corporation.

ATRIA is a trademark of Pure Atria Corporation.

CASEWARE is a trademark of Caseware International, Inc.

CLEARCASE is a trademark of Rational Software Corporation.

CONTINUUS is a trademark of Continuus Software Corporation.

CRYSTAL REPORTS is a trademark of Seagate Software Inc.

EUDORA PRO is a trademark of QUALCOMM Inc.

FRAME, FRAMEBUILDER, FRAMEMAKER, and POSTSCRIPT are trademarks of Adobe Systems Incorporated.

HELVETICA is a trademark of Eltra Corporation.

HITACHI is a trademark of Hitachi Limited.

LOGITECH is a trademark of Logitech, Inc.

MACINTOSH and APPLE are trademarks of Apple Computer Inc.

MFA is a trademark of Astec International Ltd.

MICROSOFT, MS-DOS, POWERPOINT, WINDOWS, and WINDOWS NT are trademarks of Microsoft Corporation.

NOVELL is a trademark of Novell, Inc.

PCANYWHERE is a trademark of Symantec Corporation.

PROMARK and RHOBOT are trademarks of DMI Promark, Inc.

SLR4, SLR5, and TANDBERG are trademarks of Tandberg Data ASA.

SONY is a trademark of Sony Corporation.

SYBASE is a trademark of Sybase, Inc.

TIMES is a trademark of Heidelberger Druckmaschinen Aktiengesellschaft.

3COM is a trademark of 3Com Corporation.

UNIX is a trademark of X/Open Company Limited.

WINRUNNER is a trademark of Mercury Interactive Corporation.

CallPilot
Planning and Engineering Guide

Toronto Information Products
Nortel Networks
522 University Avenue, 14th Floor
Toronto, Ontario, Canada
M5G 1W7

Copyright © 2000 Nortel Networks, All Rights Reserved

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 Meridian 1 and CallPilot 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.

The preceding page contains Nortel Networks and third-party trademarks.

Publication number:	555-7101-101
Product release:	1.07
Document release:	Standard 2.0
Date:	November 2000

Printed in the United States of America