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CallPilot

Planning and Engineering Guide

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PRELIMINARY

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NORTEL NETWORKS™

CallPilot

Planning and Engineering Guide

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29 May 2003

Draft 1.01 of the *CallPilot 2.02 Planning and Engineering Guide* is issued for its first review under the CallPilot 2.02 Tower Refresh program.

April 2003

Standard 1.0 of the *CallPilot 2.02 Planning and Engineering Guide* is issued for general release.

- added Chapter 2, “Grounding and power requirements”
- added information on system requirements (CallPilot 2.02 compatibility issues) (from the *General Release Bulletin*)
- removed Appendix B, “Planning spares requirements” from this guide (it has been incorporated into the *CallPilot Spares Planning Bulletin*)

October 2002

Standard 1.0 of the *CallPilot 2.0 Planning and Engineering Guide* is issued for general release.

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Chapter 1

Getting started with planning and engineering

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Overview

In this guide

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

The planning and engineering process results in determining the best size, platform, and location for your CallPilot system. This guide provides information about the various tools that are available to help you plan and engineer your CallPilot system.

Questions to consider

As a framework for beginning your planning and engineering tasks, consider the questions listed below.

- What is the LAN connectivity for PCs?
- What type of CallPilot server will you use?
- Where will you locate the servers?
- How will you connect the servers?

This guide helps you find answers to the preceding questions.

New features

Introduction

This section describes the new features of the CallPilot system.

Web-based features

You no longer need to install the CallPilot Administration Client software. You can use CallPilot Manager to administer the CallPilot server from any PC equipped with a web browser, such as Internet Explorer or Netscape.

CallPilot Reporter is also a web-based tool in CallPilot 2.02.

Supported switches

This guide provides planning and engineering information for the following switches:

- Meridian 1
- Succession 1000

Supported hardware platforms

CallPilot 2.02 supports the following hardware platforms:

Platform type	Server model
Intelligent peripheral equipment (IPE)	■ 200i ■ 201i
Tower	■ 702t ■ 703t **Note:** The 703t server is new for CallPilot 2.02.
Rackmount	■ 1001rp ■ 1002rp

Skills you need

Introduction

You need to possess specific skills and knowledge to use this guide effectively.

Nortel Networks product knowledge

Knowledge of, or experience with, previous releases of CallPilot and the following Nortel Networks products is helpful:

- Meridian 1
- Meridian Mail
- Succession 1000

Computer knowledge or experience

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

- Microsoft Windows NT
- Microsoft Windows 95, 98, 2000, or XP

Other experience or knowledge

Experience or knowledge in the following areas can also be useful:

- network management
- client-server systems
- flowcharting

Other resources

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

- *CallPilot 2.02 General Release Bulletin*
- *CallPilot 2.02 Spares Planning Bulletin*
- Meridian Client Compatibility Check utility
- Meridian Mail comparison
- Product bulletins
- *CallPilot Engineering Spreadsheet*

To obtain these documents and tools, contact your Nortel Networks distributor.

Nortel Networks distributors can obtain the documents and tools listed above from the CallPilot area on the Partner Information Center (PIC) web site at http://my.nortelnetworks.com.

Related information

Introduction

The CallPilot technical documents listed in this section are available on the documentation CD-ROM that you receive with your system. The documents are also available from the following sources:

- CallPilot Manager
- My CallPilot
- the Nortel Networks PIC at http://my.nortelnetworks.com

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

You can print parts of a guide or the entire document, as needed.

Planning and engineering guides

Before installing a CallPilot system, refer to the Nortel Networks technical publications (NTP) listed below to obtain information on planning

- a CallPilot system
- a data migration from Meridian Mail to CallPilot.

NTP title	NTP number
Planning and Engineering Guide	555-7101-101
Installation and Configuration Planner	Not applicable
Meridian Mail to CallPilot Migration Utility Guide	555-7101-801

Installation and configuration guides

The guides listed below provide information on the following issues:

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

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

Administration guides

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

NTP title	NTP number
Administrator's Guide	555-7101-301
Reporter Guide	555-7101-310
Application Builder Guide	555-7101-325
Desktop Messaging and My CallPilot Administration Guide	555-7101-503

Networking guides

The networking guides provide instructions on planning, installing, setting up, and troubleshooting CallPilot networking services.

Note: The CallPilot 2.02 networking guides remain mostly unchanged since CallPilot 1.0. For instructions on configuring the networking services in CallPilot 2.02, refer to the CallPilot Manager online Help.

NTP title	NTP number
Networking Enhancements Guide	555-7101-507
Networking Planning Guide	555-7101-100
NMS Implementation and Administration Guide	555-7101-302
AMIS Networking Implementation and Administration Guide	555-7101-303
Enterprise Networking Implementation and Administration Guide	555-7101-304

NTP title	NTP number
Integrated AMIS Networking Implementation and Administration Guide	555-7101-305
VPIM Implementation and Administration Guide	555-7101-306

End-user cards and guides

The following cards and guides are designed for CallPilot end users, such as phone set users and desktop messaging users:

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

Troubleshooting

The *CallPilot Troubleshooting Reference* document describes symptoms that can appear on all CallPilot server platforms, and provides methods to resolve the symptoms.

Nortel Networks continually updates the *CallPilot Troubleshooting Reference* document, which is available from the Nortel Networks PIC at http://my.nortelnetworks.com.

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

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

Using online sources

CallPilot administration online Help

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

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

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

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

For more information on using the online Help utility, access the CallPilot Manager Help, open the Getting Started book, and click “Navigating CallPilot Manager help.”

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

CallPilot end-user online Help

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

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

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

Contacting technical support

Contact your distributor’s technical support organization to obtain help with troubleshooting your system.

Components of a CallPilot system

Introduction

Before starting the planning of a CallPilot system, you must understand the key components that must be provisioned, and the interaction of the components. This section provides a high-level overview of these concepts. For more details, refer to the *Installation and Configuration* documents that apply to your CallPilot server type.

System components

A CallPilot system consists of three key components: switch, server, and PC. The Unified Messaging is an optional feature that can be installed on PCs. For web messaging, a customer-provided web server is another optional component. The web server allows PC users to access messages using a web browser, such as Internet Explorer and Netscape.

Switch types

The switch types that are compatible with CallPilot 2.02 include models of the following switch families:

- Meridian 1
- Succession 1000.

More information on the CallPilot compatibility with various types of switches is provided later in this guide.

Server types and connection methods

The following table presents the types of CallPilot 2.02 server platforms:

Platform	Type
200i, 201i	Intelligent peripheral equipment (IPE)
702t, 703t	Tower
1001rp, 1002rp	Rackmount

The following table summarizes the compatibility of switches with CallPilot server platforms:

Switch	CallPilot server platform					
	200i	201i	702t	703t	1001rp	1002rp
Meridian 1	✔	✔	✔	✔	✔	✔
Succession 1000	✔	✔	✔	✔	✔	✔

The connectivity of the Meridian 1 switch and the Succession 1000 system with the CallPilot server is achieved by way of the embedded LAN (ELAN) and network loop through the MGate card.

Desktop PCs

Use a PC with a web browser to access CallPilot Manager to

- maintain and administer the CallPilot software
- view reports

Use a PC or a wireless device with desktop messaging installed to download messages from the CallPilot server. A web server allows PC users to access messages using a web browser.

Components to provision

The following components must be provisioned:

- CallPilot server
- PC for CallPilot administration and Reporter
- switch resources related to CallPilot
- desktop client PCs (if the desktop messaging feature is required)
- web server for Web Messaging, CallPilot Reporter, and CallPilot Manager

The functionality of the web server and CallPilot Manager resides on the CallPilot server, since both components are automatically installed. A separate web server is not required for CallPilot Manager administrator or My CallPilot end-user web services. However, if CallPilot Reporter is required for management reporting, then a separate web server is needed.

Component list

The *CallPilot 2.02 Models and Ordering Procedures* document (SM-2002-1574) provides component lists for each CallPilot server platform.

To obtain the *CallPilot 2.02 Models and Ordering Procedures* document, contact your Nortel Networks distributor. If you are a Nortel Networks distributor, then you can obtain this document from the CallPilot area on the PIC web site at http://my.nortelnetworks.com.

Chapter 2

Grounding and power requirements

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Overview

This chapter presents the guidelines for providing power and grounding to switch and CallPilot equipment, and describes the auxiliary power requirements. However, if the information in this chapter conflicts with the local or national code, then follow the code.

Before the CallPilot server installation, a qualified electrician must implement the single-point ground reference, as required, between the CallPilot server power outlets and the switch power outlets.



DANGER

Risk of electric shock

If you fail to ground the switch and CallPilot equipment correctly, the installation can be

- unsafe for personnel
- unprotected from lightning or power transients
- subject to service interruptions, degraded performance, and loss of information

Power and grounding guidelines

Introduction

The power and ground for the switch and the CallPilot equipment must originate from the supply service (equipment room service panel or transformer), where the ground conductor and the neutral conductor are connected and referenced to the main building ground. All power feeds must contain a separate safety conductor (green wire).

Note: Do not use the main building ground directly as the ground reference for the system.

Power

The service panel, which must be located in the equipment room, must not service lighting, air conditioning, heating, generators, or motors. Nortel Networks strongly recommends that supply conductors be dedicated and uninterrupted from a building primary source to the dedicated equipment room service panel.

Power is supplied to the service panel by a power transformer. The transformer typically provides secondary voltages of 208/120 V three-phase four-wire “wye” service, 240/120 V single-phase four-wire “delta” service, or 240/120 V single-phase three-wire service. Collectively, these secondary voltages are referred to as “nominal 208/240 V ac.”

A dedicated power transformer for the switch, CallPilot server, and associated auxiliary and telephone operating company interface equipment is preferred. However, a shared transformer or distribution is acceptable.

Do not use ground fault circuit interrupt (GFCI) devices on the switch and CallPilot power feeds.

Single-point ground

The switch and the CallPilot system require a single-point ground (SPG) topology for all switch equipment and all CallPilot associated auxiliary equipment respectively.

The switch and the CallPilot system have several types of grounds and several types of signal returns that are generally referred to as grounds:

- In AC systems, a logic return (LR or LRTN) and a green wire frame ground, called the AC equipment ground (ACEG), are typically part of the input power cord.
- In DC systems, a logic return (LR or LRTN) and a battery return (RTN), as well as an AC equipment ground (ACEG) green wire, are on the input to the rectifier(s).
- All systems must have an external hard-wired frame ground connection (also called the personal hazard safety ground). The frame ground is connected internally to the ACEG green wire. As the frame ground is hard-wired, it ensures that the equipment has a ground connection even if the system is “unplugged.”
- External Communications wiring that meet the requirements as stipulated in NEC Article 800-30 FPN 4 require the use of lightning protection. The cable sheaths, and protection grounds must be installed as indicated in NEC Article 800-33, and Article 800-40 (b).

For an SPG topology, each of the preceding grounds, from each of the columns, must terminate at a single connection point before attaching to the actual ground reference at the service panel or transformer. Physically, the SPG is usually a copper bar or plate (referred to as a bus). In its simplest form, the SPG (the single connection point) can be an isolated ground bus or an ACEG bus in the service panel or transformer.

Refer to the documentation associated with the switch or system configured with CallPilot for further information on grounding requirements. The following table presents useful Meridian 1 or Succession 1000 NTPs:

NTP title	NTP number
Meridian 1 Installation Planning	553-3001-120
Meridian 1 Power Engineering	553-3001-152
Meridian 1 System Installation Procedures	553-3001-210
Planning and Installation Guide for Option 11C Mini	553-3021-209
Planning and Installation Guide for Option 11C	553-3021-210
Planning and Engineering Guidelines - Succession 1000	553-3023-102
Installation and Configuration - Succession 1000	553-3023-210

Also refer to the ANSI-J-STD-607-A-2002 standard *Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications*.

Follow these requirements when implementing the SPG:

- All ground conductors must be identified according to local codes and terminated permanently.
- Terminations must be accessible for inspection and maintenance during the life of the installation.
- All grounding conductors must be
  - continuous, with no splices or junctions,
  - tagged “Do not remove or disconnect”
  - insulated against contact with foreign grounds

- Grounding conductors must be no load, non-current carrying cables, under normal operating conditions.
- The ground interface in a steel-framed building must have a single connecting reference located at the service panel, to the building steel on the same floor as the switch and the CallPilot system (or within one floor from the switch and the CallPilot system).

  Note: Nortel Networks does not recommend the use of building steel as an integral part of the switch and CallPilot ground system. The building steel is a reference point only.

The DC resistance of the system ground conductor, which runs from the switch to the main building ground, must be as close to zero as possible. The maximum total resistance on all runs within the building must not exceed 0.5 ohms.

Auxiliary power

Terminal devices

Terminal devices located in the equipment room require local power. Power for these devices must be wired and fused independently from all other receptacles, labeled at the service panel (to prevent unauthorized power interruption), and referenced to the same interface point on the building system ground as the service panel ground.

Auxiliary power in the equipment room can be supplied by isolated or non-isolated service receptacles, but the receptacles must match the grounding for the system. In other words, if the switch and the CallPilot server have an isolated ground topology, the receptacles must also be isolated.

Auxiliary equipment

If auxiliary equipment using an RS-232 interface is too remote to be powered from the service panel, a modem or fiber link is required for ground isolation. Failure to provide this isolation defeats the SPG required by the system.

Existing power and grounding

Existing power and grounding on some sites can make it difficult to ensure that the local power grounding is referenced to the same potential as the system ground. In addition, local power grounding can form part of a common grounding network that is subject to noise from external sources. Under these conditions, where locally powered terminals and equipment connect directly to the system through DC coupled links sharing a common ground, incidental ground loops can form and inject noise onto the system.

Chapter 3

System configurations

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Overview

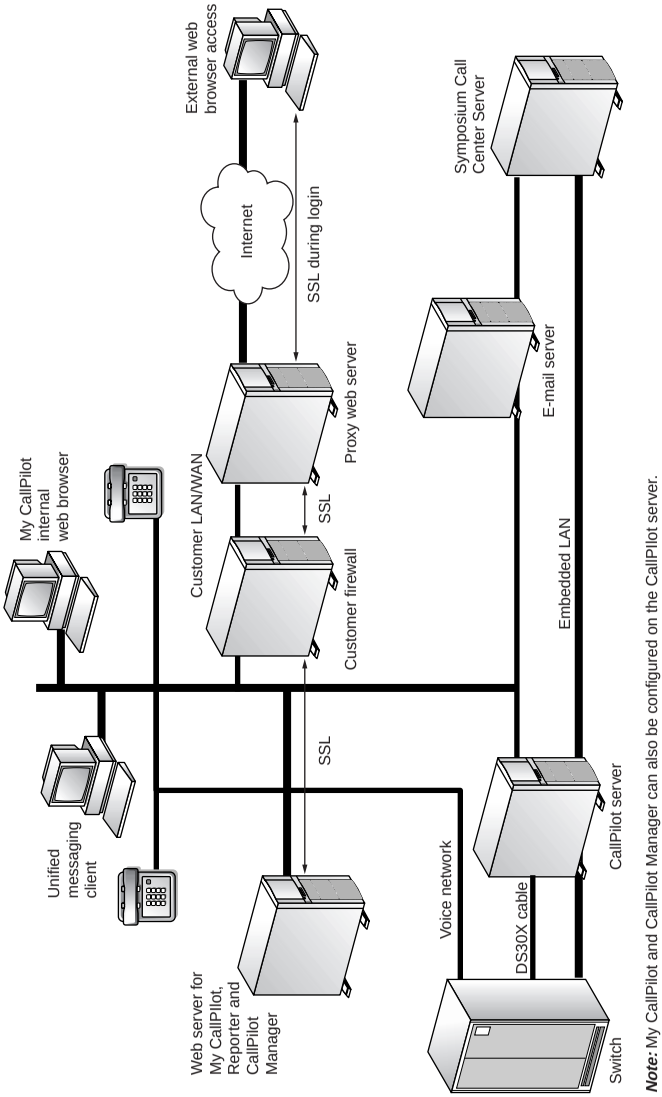
Introduction

This chapter provides an overview of the system configurations that CallPilot 2.02 supports. The information provided in this chapter helps you understand the CallPilot system, as well as the hardware and software components that must be provisioned.

For more details on the CallPilot network layout, refer to the CallPilot *Installation and Configuration* guides that apply to your CallPilot server platform. The installation and configuration guides address, for example, the interaction between the switch and the CallPilot server.

CallPilot architecture

The following diagram provides an overview of the CallPilot architecture:



The following considerations apply to the interaction of CallPilot with switches and web servers by way of LAN connections:

- For signaling services, CallPilot connects to the Meridian 1 switch or Succession 1000 system by way of an embedded LAN (ELAN), which is also used by other Nortel Networks applications.
- For voice services, CallPilot connects to the Meridian 1 switch or Succession 1000 system by way of an ELAN and DS30X time division multiplexing (TDM) connection(s).
- CallPilot connects directly to the users' PCs through a customer LAN (CLAN).
- CallPilot can use an optional external Internet Information Server (IIS) to provide management and end-user web services.

Supported server platforms

You can install the CallPilot software on a 200i or 201i server that resides in one of the following locations:

- the intelligent peripheral equipment (IPE) shelf in a Meridian 1 switch
- the Media Gateway or Media Gateway Expansion of the Succession 1000 system

You can also install CallPilot software on a tower (702t or 703t) or rackmount (1001rp or 1002rp) platform. You can connect the tower and rackmount platforms to any of the supported switches.

Supported switches

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

- Meridian 1 (supported by all CallPilot servers)
- Succession 1000 (supported by all CallPilot servers, except the 200i platform)

For information about the hardware and software requirements, see “Switches and Voice over IP system” on page 46. For information about the connectivity requirements, see “Connectivity requirements” on page 53.

Web server for CallPilot administration

CallPilot Manager, Reporter and My CallPilot are web-based applications, which require a web server. In particular, a customer-supplied Microsoft IIS web server is required for CallPilot Reporter. If you are running just CallPilot Manager, My CallPilot, or both, then you can use the CallPilot server as the web server.

Note: If the CallPilot server is a 200i IPE server, then My CallPilot must be installed on a separate, customer-provided web server.

Users connect to the web applications with a web browser, such as Internet Explorer or Netscape.

The web server hard drive must have free space of approximately 1.0 Gbyte or more available for CallPilot web services, and for the database of operational measurements.

See “Web server for CallPilot” on page 48 for more information.

CallPilot Reporter

If you are using CallPilot Reporter, then you need an external, customer-provided, server that runs an additional instance of the IIS. For information about the minimum configuration requirements of the My CallPilot web server, see “Web server for CallPilot” on page 48.

Desktop messaging clients

The desktop messaging client that is available with CallPilot can be installed on a PC running Windows 95, 98, 2000 Professional, NT 4 with service pack (SP) 6a, or XP Professional.

For information on the desktop messaging clients that CallPilot supports, refer to “Compatibility with customer e-mail environments” on page 77

For information about the minimum configuration requirements, refer to “CallPilot desktop messaging” on page 52.

Section A: Hardware and software configurations

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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 2.02 can be one of the following:

- a server that fits in the IPE shelf of a Meridian 1 switch (200i or 201i) platform or Succession 1000 system (201i platform)
- a tower chassis (702t or 703t platforms)
- a rackmount chassis (1001rp or 1002rp platforms)

You can connect the tower and rackmount platforms to any of the supported switches.

Software

The CallPilot software configuration comprises the following items:

- server operating system (Windows NT Server 4.0 operating system with SP 6a and all applicable Microsoft security hot fixes)
- 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:

- Audio Messaging Interchange Specification-Analog (AMIS-A) networking
- Enterprise networking
- Voice Profile for Internet Mail (VPIM) networking with Meridian Mail Net Gateway

However, some compatibility limitations apply. Refer to “Limits within networking” on page 77 for details.

Multi-tenant Meridian 1 switch

CallPilot supports users on a multi-tenant Meridian 1 switch as if they were on a single-tenant system. However, CallPilot does not

- support more than a single customer of a multi-customer Meridian 1 switch
- know to which Meridian 1 tenant a user belongs
- have administration or billing features by tenant

Custom Controlled Routing

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

CallPilot does not support the CCR command `Give IVR`.

Internet Telephony Gateway

The Internet Telephony Gateway (ITG) 1.1 (version 1.0.34 or later) supports the AMIS-A and Enterprise networking protocols, while ITG 2.0 supports the Network Message Service (NMS) protocol. However, additional considerations apply to the NMS implementation on Voice over IP (VoIP) networks with CallPilot. Refer to product bulletins for information on the implementation of VoIP and voice messaging.

Third-party Windows NT server software and hardware

Only the third-party applications that Nortel Networks identified explicitly as supported by CallPilot can be installed on a CallPilot server.

The following third-party software applications are currently authorized to be installed on the CallPilot server:

- one of the following approved antivirus software applications:
  - Computer Associates eTrust InoculateIT 4.53
  - McAfee NetShield for Windows NT 4.5
  - Symantec Norton AntiVirus version 2001, version 7

  Note: For more details on installing antivirus software on CallPilot, refer to *Product Bulletin 2002-035, "Support for Anti-Virus Applications."*
- Symantec pcAnywhere, version 10.5
- if the server is equipped with a redundant array of independent disks (RAID) device, one of the following applications:
  - Mylex Workstation Array Manager
  - Mylex Global Array Manager
  - Power Console Plus Package

The installation of non-recommended 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) compliance. For more information, refer to *Product Bulletin 99067, "CallPilot Unauthorized Hardware and Software*."

See also

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

Symposium Call Center Server

CallPilot 2.02 support of Symposium Call Center Server

CallPilot 2.02 provides integrated voice services to Symposium Call Center Server 4.2. CallPilot 2.02 brings the same capabilities as Meridian Mail to Symposium Call Center Server. Refer to the product bulletin for information on specific issues concerning the implementation of the service integration.

CallPilot 2.02 can coexist with Symposium Call Center Server 4.2 with service update (SU) 7 or later, and with Symposium Express 4.2 or later on the same Meridian 1 switch, ELAN, and CLAN. Signaling between the CallPilot server and Symposium Call Center Server travels over the ELAN and CLAN.

CallPilot supports the following voice processing element commands:

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

CallPilot and Symposium Call Center Server voice services

The CallPilot voice channels used to provide voice services to the call center must be dedicated to Symposium Call Center Server and cannot be used for general messaging traffic. The CallPilot voice channels for Symposium Call Center Server are further partitioned into two groups, one for the Give IVR and the other for the Advanced Voice Processing services.

Besides dedicated voice channels, no additional software options are required on CallPilot to integrate with the Symposium Call Center Server.

Migration to CallPilot from Meridian Mail

Migration to CallPilot from Meridian Mail provides for full prompt migration by tape.

The full voice prompt migration provides the following advantages:

- no prompt renumbering
- no required Symposium Call Center Server scripting changes
- support for deleting unused prompts
- extended prompt sizes
- enhanced editing control using third-party software, such as PeriStudio

The Symposium Call Center Server can be split between Meridian Mail and CallPilot for voice services. All ACCESS applications must be migrated at once.

For more information on migration, refer to the following documents:

- *Meridian Mail to CallPilot Migration Utility Guide* (555-7101-801)
- Appendix A, “Migrating from Meridian Mail to CallPilot” in the *Nortel Networks Symposium Call Center Server Voice Processing Guide, Product Release 4.2*

CallPilot Application Builder

CallPilot Application Builder replaces the Symposium Call Center Server Voice Prompt Editor. Application Builder offers WAV format import capability and enhanced prompt production using third-party editing software.

Switches and Voice over IP system

Introduction

This section identifies the switches and the Voice over IP (VoIP) system that CallPilot 2.02 supports.

Meridian 1 switch

CallPilot supports the following Meridian 1 platforms:

- Option 11C
- Option 11C Mini
- Option 81
- Options 51C, 61C and 81C

You need the following software on the Meridian 1 switch:

- North America—X11 release 23.55 or higher
- Europe—X11 release 24 or higher

For more details about the required software and packages, refer to *Part 3: Meridian 1 and CallPilot Server Configuration* installation guide.

For information about the connectivity requirements, see “Connectivity” on page 54.

Succession 1000 (VoIP system)

The Succession 1000 VoIP system includes

- fully installed and configured Succession 1000 server
- Media Gateway
- Media Gateway Expansion (optional)
- connection to a transmission control protocol/Internet protocol (TCP/IP) network such as an ELAN

To support the CallPilot servers, the Succession 1000 system requires the following software:

- X21 Release 1.0 or later for the 201i server
- X21 Release 1.1 or later for the 702t, 703t, 1001rp, and 1002rp servers

For more information about the required X21 patches (if any), refer to the *CallPilot General Release Bulletin.* You can find this document on the Nortel Networks Partner Information Center at http://my.nortelnetworks.com.

For information about the connectivity requirements, see “Succession 1000” on page 67.

Web server for CallPilot

Introduction

This section provides the hardware, software, networking, and engineering considerations for planning CallPilot web servers.

CallPilot 2.02 provides three web services:

- CallPilot Manager (system configuration and management)
- CallPilot Reporter (report generation)
- My CallPilot (end-user mailbox configuration, messaging and documentation)

A Microsoft Internet Information Server (IIS) running either on a CallPilot server or on an external, customer-supplied, Windows NT or 2000 server hosts the three CallPilot 2.02 web services.

CallPilot web services

Configurations

CallPilot supports the following web server configurations:

1. All three web services reside on an external IIS server (recommended).

   This configuration provides better security. The customer's IT department can manage and apply the latest IIS security practices to the server.

2. Hybrid configuration

   - My CallPilot resides on the CallPilot server.
   - CallPilot Manager and Reporter reside on an external IIS server.

CallPilot Reporter cannot be installed on the CallPilot server. The high CPU loads associated with running reports are inconsistent with the CallPilot server mission as a real-time application environment.

When CallPilot Reporter is installed on an external IIS server, CallPilot Manager is also installed on the external IIS server.

CallPilot Manager and My CallPilot can be installed on both CallPilot and the external IIS server, but Nortel Networks does not recommend this configuration.

Remarks

CallPilot is supplied pre-engineered to support My CallPilot or CallPilot Manager IIS web services, or both, and still be capable of providing high performance levels to all other services running on CallPilot. End-user and administrator web browsers can access the IIS server on CallPilot by way of the CallPilot IP address on the CLAN. No additional engineering considerations apply.

External web server configuration

The external web server, which hosts the CallPilot web services, connects to the CallPilot server by way of the CallPilot server IP address on the CLAN.

Hardware requirements

Since web messaging through My CallPilot and Reporter web services can generate high CPU loads, the minimum recommended hardware configuration for the external web server must include the following:

- 600 MHz PIII system
- 128 Mbytes of RAM

Software requirements

The external web server requires the following software:

- Microsoft Windows NT 4 Server with service pack 6a and option pack 4, IIS 4, and the applicable Microsoft security hot fixes

or

- Windows 2000 server with IIS 5 and the applicable Microsoft security hot fixes

If the secure socket layer (SSL) technology is to be used, you must purchase and install an additional IIS certificate from the vendor.

Free disk space requirement

Generally, the server must have approximately 1 Gbyte of free disk space available for the installation of CallPilot web services. If the Reporter service is used for a large CallPilot system or a network of CallPilot systems, Nortel Networks recommends that the free disk space be estimated using the following formula:

```
Free disk space = 300 Mbytes + [(total # of channels *
(days in DB + 1) * 0.2 Mbytes]
```

where

- The total # of channels is the total number of channels on all CallPilot systems for which the Reporter database contains data.
- Days in DB is the number of days that data will be stored in the Reporter database.

Engineering the server

The following factors drive the web server load from CallPilot services:

- the number of My CallPilot users
- the number of users accessing messages from My CallPilot versus the number of users using desktop messaging clients such as Microsoft Outlook
- the number of reports generated during busy hours

The web server does not have to be dedicated to CallPilot web services. The same server can host other web pages or provide standard network services, such as printing and file sharing. However, running other applications and services on the server can cause slow response levels for CallPilot services and significantly lower user productivity and satisfaction with the services. Therefore, Nortel Networks recommends you to dedicate the web server to CallPilot web services.

Monitoring performance

You must monitor the web server performance after an installation or a major change, such as the addition of more users, to detect a possible system overload. If the response time is slow during the busy hour, then monitor the level of activity on the web server to determine if the server is overloaded. Windows NT Performance Monitor can provide this information.

The two main indicators to monitor are as follows:

- the CPU usage
- the available memory

If the CPU usage (shown as Processor Time) is constantly above 90 percent for a significant number of minutes during the busy hour or the memory availability (shown as Available Bytes) is ever below 4 Mbytes, or both, then the user response time can be degraded.

Supported web browsers

CallPilot web services can be accessed from a PC that runs the Windows operating system with one of the following web browsers:

- Internet Explorer 5.0 or higher
- Netscape 6.2 or higher

Application Builder

Application Builder is the administrative service that is used to build voice menus and auto attendant application services. Application Builder requires the installation of a client on the administrator’s PC. You can download the client, on demand, from the CallPilot Manager web service to the PC.

CallPilot desktop messaging

General

Refer to Section C: “System requirements,” on page 71, for information on the following issues:

- desktop messaging operating systems and clients that CallPilot supports
- software requirements for each client

Disk storage for messages

CallPilot uses a proprietary sub-band voice encoding format at 18 kbit/s. To calculate the disk space used for voice in the CallPilot message store of desktop messaging, use the following conversion factor:

```
141 kbytes = 1 minute of voice (SBC or VBK)
```

Note: Messages are kept in the message store on the PC only if they are played by way of the PC.

If a voice message is converted and saved to disk as a WAV file, then use this conversion factor:

```
945 kbytes = 1 minute of voice (WAV)
```

See also

For more information on the desktop messaging software available with CallPilot, refer to the following documents:

- *Desktop Messaging and My CallPilot Administration Guide* (555-7101-503)
- *Desktop Messaging User Guide* for each client

Section B: Connectivity requirements

In this section

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Connectivity

Overview

CallPilot uses both LAN and voice switch connectivity.

The CallPilot server connects to the customer's IP network through the CLAN, and to the Nortel Networks voice system through the ELAN and one or more proprietary TDM DS30X connection.

For more information on the CallPilot connectivity, refer to "CallPilot architecture" on page 35.

CLAN connections

Introduction

The CLAN connectivity is required for

- Unified Messaging
- Voice Profile for Internet Mail (VPIM) Networking
- Simple Network Management Protocol (SNMP)
- CallPilot web services: CallPilot Manager, Reporter, and My CallPilot

Hardware requirements

You must provide your own LAN hub and associated cables for the connection of your LAN or WAN to the CallPilot server.

Supported LANs

The following table identifies the types of Ethernet LANs that the CallPilot servers support:

CallPilot platform	Ethernet		
	10 Mbit/s	100 Mbit/s	1 Gbit/s
200i	✔		
201i	✔	✔	
702t	✔	✔	
703t	✔	✔	✔
1001rp	✔	✔	
1002rp	✔	✔	

Supported network protocols

CallPilot supports only the Windows transmission control protocol/Internet protocol (TCP/IP) stack (Windows TCP/IP networking) on client PCs. CallPilot does not support Novell internetwork packet exchange/sequenced packet exchange (IPX/SPX) or TCP/IP stack on client PCs. However, CallPilot can function 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 support the traffic between the client PCs and the CallPilot server. When calculating the bandwidth capacity, consider the facts identified in the following table.

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.
My CallPilot web server 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 the average data transfer rates for each user

Traffic type	Voice messaging (kbit/s)	Fax messaging (kbit/s)	Both (kbit/s)
Desktop Messaging	0.09	0.06	0.15
My CallPilot web server traffic in WAV format	0.12	0.10	0.22
My CallPilot web server traffic in VBK format	0.15	0.10	0.25

Notes:

1. The average voice messaging rates are based on the assumption that 60 percent of the voice messages are transferred across the customer data network, and that the remaining 40 percent are retrieved by phone.
2. The average messaging rates are based on the assumption that 80 percent of the fax messages are transferred across the network, and that fax messaging users retrieve their fax messages using either a desktop messaging or My CallPilot web server client. The remaining 20 percent of the fax messages are retrieved by way of fax machines.
3. The transfer rates for My CallPilot web server files include the message transfer rates from CallPilot to the web server, and the transfer rates from the web server to the web browser.
4. My CallPilot web server with VBK (CallPilot proprietary encoding format) requires that the Nortel Networks voice player be installed on the client PC.
5. The embedded player in My CallPilot plays messages in VBK format.

ELAN connections

Introduction



CAUTION

Risk of severe performance degradation

To prevent severe performance degradation, the customer's network must not be connected to the ELAN hub. Only Nortel Networks products must be connected to the ELAN hub.

The ELAN is used for low-delay, mission-critical signaling between the real-time services provided by CallPilot, Symposium, or both, and the switch or Succession 1000 system using the proprietary Application Module Link (AML) protocol that is also used by Meridian Mail. It is therefore essential to keep all other customer data traffic off the ELAN.

ELAN hardware requirements

The ELAN runs between CallPilot, Symposium, Optivity Telephony Manager (OTM), and the switch or the Succession 1000 system; see the diagram in "CallPilot architecture" on page 35. The private 10Base-T ELAN is implemented using

- a Medium Attachment Unit (MAU) to 10Base-T transceiver(s) for connection to the call processor
- category 5 cables
- a dedicated hub that can be supplied by either Nortel Networks or a third party

If CallPilot is added to an existing system and an ELAN is already implemented, then only a category 5 cable is required to connect the CallPilot server to the ELAN hub.

ELAN connectivity requirements on the switch

The CallPilot server connects to the Meridian 1 switch or Succession 1000 system through a proprietary TDM DS30X connection for voice services, and through the ELAN for signaling services.

Separate ELAN connections are required as follows:

- Option 81 Meridian 1 switch: one connection for each call processor
- Succession 1000 system: one connection for the call server and one connection for the Media Gateway or Media Gateway Expansion

Option 11C hardware requirements

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

Options 51C, 61C, 81C and 81 hardware requirements

You can find the prices of all referenced parts in the current Meridian Product Catalog.

The Meridian 1 Options 51C, 61C, 81C and 81 must be equipped with the appropriate Ethernet IOP/CMDU card or IODU/C cards to support the connection to the ELAN.

The following table provides a list of the Ethernet IOP/CMDU card or IODU/C cards. The digit given in parentheses beside the card identifier indicates the number of cards required.

Meridian 1 switch	IOP card	Combo card	IODU/C card
Option 51C	NT6D63BA (1)	NT5D20BA (1)	NT5D61AA/BA (1)
Option 61C	NT6D63BA (2)	NT5D20BA (2)	NT5D61AA/BA (1)
Option 81C	Not applicable	NT5D20BA (2)	NT5D61AA/BA (2)
Option 81	NT6D63BA (2)	NT5D20BA (2)	NT5D61AA/BA (2)

A Meridian 1 switch that is on X11 Release 23.55 (or upgraded to this release) can also be upgraded with IODU/C cards. The IODU/C cards provide the following functions:

- Ethernet connectivity to the ELAN (comparable to the capability of the IOP/CMDU cards)
- drive unit functions
- input/output processing functions

Meridian 1 ELAN hub cabling requirements

The following cables connect the Meridian 1 switch to the ELAN hub:

- Option 11C: NTDK27AA (A0630723)

  This cable connects to CORE backplane position P1.
- Option 51C, 61C, 81, and 81C: NT7D90CA (A0406481)

  This cable connects to CORE backplane slot 16 Position F.

A DB-15 to 10Base-T transceiver is necessary to convert the DB-15 end of the Ethernet cable to a 10Base-T end. The RJ-45 connector of the transceiver can then be connected to the ELAN hub.

Each site must have one or two DB-15 to 10Base-T transceivers depending on the number of CORE backplanes. You can purchase the DB-15 to 10Base-T transceivers (DB-15 to RJ-45) in any computer supply store, or you can order them from Nortel Networks:

Description	PEC	CPC
Transceiver (MAU to 10Base-T)	NTRH9069	A0795886

ELAN power requirements

CallPilot performs real-time call control signaling to the Meridian 1 switch or Succession 1000 system over the ELAN using the proprietary AML protocol, which is also used by Meridian Mail.

Because the customer expects telephone and messaging service to continue through power disruptions, an uninterruptible power supply (UPS) can be used to protect the Meridian 1 switch or Succession 1000 system, and the CallPilot power source. In this case, you must also protect the ELAN hub with a UPS.

If power to the ELAN hub is disrupted, then CallPilot service stops because the AML signaling link to the Meridian 1 switch or Succession 1000 system is interrupted.

Meridian 1

Introduction

The CallPilot server connects to the Meridian 1 switch by way of an ELAN using the TCP/IP protocol at a rate of 10 Mbit/s.

For a list of supported Meridian 1 switches, refer to “Supported switches” on page 36.

IPE (200i and 201i) platform connectivity requirements

Each 200i or 201i CallPilot server 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 200i or 201i server appears logically equivalent to an extended digital line card (XDLC). Each 200i or 201i CallPilot server contains one embedded digital signal processor (DSP) and can accept optional DSPs through inserted MPC-8 cards.

200i server

A 200i server supports up to 24 DS0 channels:

- 8 embedded channels
- 16 additional channels through 2 optional MPC-8 cards.

The 200i server occupies two slots in the Meridian 1 IPE shelf, but does not connect to the backplane for the second slot. Therefore, the 200i server is presented to the switch as one card.

201i server

A 201i server supports up to 40 DS0 channels:

- 8 embedded channels
- 32 additional channels through 4 optional MPC-8 cards

The 201i server occupies two slots in the Meridian 1 IPE shelf and connects to the backplane so that both slots have access to the DS30X connection associated with the second slot. Therefore, the 201i server is presented to the switch as two cards.

Tower and rackmount connectivity requirements

One MPB16-4 or MPB96 board in the server connects to up to three MGate cards in the Meridian 1 switch.

MPB16-4 board

The MPB16-4 board in the 702t, 1001rp, or 1002rp server provides from 16 to 48 multimedia processing units (MPU), as well as DS0 channel connectivity to the Meridian 1 switch, as follows:

- The MPB16-4 board contains two embedded DSPs (2 x 8 MPUs = 16 embedded MPUs).
- Up to four MPC-8 cards can be inserted in an MPB16-4 board (4 x 8 MPUs for each card = 32 additional MPUs).
- Each MPB16-4 board provides a maximum of 48 MPUs (16 embedded MPUs plus 32 additional MPUs from inserted MPC-8 cards).

The number of DS0 channels is equal to the number of MPUs, which gives a maximum of 48 DS0 channels.

The MPB16-4 board is installed in the PCI bus of the tower or rackmount server. When multiple MPB16-4 boards are installed, an SCbus cable connects the boards.

MPB96 board

The MPB96 board is installed in the 703t server and provides up to 96 MPUs, as well as DS0 channel connectivity to the Meridian 1 switch, through embedded DSPs. The MPC-8 cards are not necessary when the MPB96 board is used.

MGate card

The tower (702t or 703t) and rackmount (1001rp or 1002rp) platforms connect to the network loops through the MGate card. Each MGate card provides 32 channels, occupies one slot in the Meridian 1 IPE shelf, and connects to the MPB board in the CallPilot server as follows:

- MPB16-4 board: with a 10 m (30 ft) twisted pair cable
- MPB96 board: with a 20 m (60 ft) twisted pair cable

For more information about establishing the connection between the CallPilot server and the Meridian 1 switch, refer to *Part 3: Meridian 1 and CallPilot Server Configuration* in the *Installation and Configuration* binder.

The MGate card provides a maximum of 32 channels. A fully configured 96-channel tower or rackmount system requires three MGate cards in the switch.

Meridian 1 IPE resource requirements

A non-blocking configuration recommended for the IPE shelf can require the provisioning of additional network loops to the IPE shelf. The IPE shelf version must be NT8D37BA/EC or later.

Meridian 1 software (X11) requirements

CallPilot requires X11 release 23.55 or later on the Meridian 1 switch.

If the CallPilot server provides Symposium voice services, then X11 release 24 or later is required by Symposium Call Center Server 4.2.

The following X11 base software options are required for CallPilot:

- 41 – ACDB (ACD Package B)
- 46 - MWC (Message Waiting Center)
- 214 – EAR (Enhanced ACD Routing)
- 215 – ECT (Enhanced Call Treatment)
- 218 – IVR (Hold in Queue for IVR)
- 247 – Call ID
- 254 – PHTN (Phantom TN)
- 324 – NGEN (CallPilot Connectivity) which requires the following:
  - 77 - CSL (Command Status Link)
  - 153 - X25AP (Application Module Link - AML)
  - 164 – LAPW (Limited Access to Overlays)
  - 242 – MULI (Multi-User Login)
  - 243 – Alarm Filtering
  - 296 – MAT (Meridian Administration Tool)
- 364 – NMCE (CallPilot)

Certain X11 performance enhancement packages (PEP) must also be installed to support CallPilot. For more information on PEPs, refer to the *CallPilot General Release Bulletin*.

Meridian 1 memory and real-time engineering

The Meridian 1 real-time impact of CallPilot is essentially the same as the impact of Meridian Mail for the equivalent call traffic.

A Meridian 1 switch upgraded to X11 release 23.55 or later can require additional memory. Refer to *Product Bulletin 98097* for details.

CallPilot usage of Meridian 1 software resources

Ensure that sufficient software resources are provisioned on the Meridian 1 switch to support CallPilot. The software resources are, for example, terminal number (TN) levels, automatic call distribution (ACD) agents, control directory numbers (CDN), and voice ports. CallPilot does not share Meridian 1 resources with other applications.

- A primary CDN is required for most traffic. A secondary CDN is required for fax call answering.
- One phantom TN/DN or dummy ACD queue is required for each service that has an entry in the Service DN table, which is equivalent to the voice service directory number (VSDN) table on Meridian Mail. CallPilot uses the phantom TN/DN in the same way as Meridian Mail.
- CallPilot uses one ACD queue to manage its hardware channels. A second ACD DN is required for the default DN.
- CallPilot uses one ACD agent for each channel.
- Each fax user with a virtual fax machine DN requires one phantom DN and one direct inward dial (DID) line (optional).
- Each service accessed from outside the Meridian 1 switch requires one DID line.

Succession 1000

Introduction

The Succession 1000 system supports the following CallPilot servers:

Platform type	Server models
IPE	201i
Tower	702t and 703t
Rackmount	1001rp and 1002rp

The CallPilot server connects to the Succession 1000 system by way of the Media Gateway or Media Gateway Expansion using the ELAN. The voice services are routed through the Media Gateway, and the signaling services are routed through the ELAN.

IPE connectivity requirements

The 201i server is installed in two slots of the Media Gateway or Media Gateway Expansion. For details on the CallPilot 201i server installation, refer to *Part 2: 201i Server Hardware Installation* document in the *Installation and Configuration* binder.

Tower and rackmount connectivity requirements

The tower (702t and 703t) and rackmount (1001rp and 1002rp) servers connect to the Succession 1000 system by way of the MGate card. Each MGate card occupies one slot in the Media Gateway or Media Gateway Expansion and connects to an MPB16-4 or MPB96 board in the CallPilot server as follows:

- MPB16-4 board: with a 10 m (30 ft) twisted pair cable
- MPB96 board: with a 20 m (60 ft) twisted pair cable

For more information, refer to *Part 3: Succession 1000 and CallPilot Server Configuration* documents in the *Installation and Configuration* binder.

Each MGate card supports a maximum of 32 channels. The maximum capacity of a CallPilot tower or rackmount connected to a Succession 1000 system is 48 channels, which require 2 MGate cards.

CallPilot uses the same media processing hardware with Succession 1000 as with the Meridian 1 switch:

- up to two MPB16-4 boards, each with 48 MPUs of DSP resources and 48 DS0 channel connectivity to the switch, or
- one MPB96 board with 48 MPUs of DSP resources and 48 DS0 channel connectivity to the switch

See “Tower and rackmount connectivity requirements” on page 63.

Succession 1000 (X21) software requirements

CallPilot requires X21 release 1.1 or 2.0 or later on the Succession 1000 system.

Depending on regions and feature set level, the Succession 1000 release 2.02 Basic Software Services Level—NTM400xx includes the following features:

- 41 – ACDB (ACD Package B)
- 46 - MWC (Message Waiting Center)
- 214 - EAR (Enhanced ACD Routing)
- 215 - ECT (Enhanced Call Treatment)
- 218 - IVR (Hold in Queue for IVR)
- 247 - Call ID (for AML Applications)
- 254 - PHTN (Phantom TN)
- 324 - NGen (CallPilot Connectivity), which requires the following:
  - 77 - CSL (Command Status Link)
  - 153 - X25AP (Application Module Link - AML)
  - 164 - LAPW (Limited Access to Overlays)
  - 242 - MULI (Multi-User Login)
  - 243 - Alarm Filtering
  - 296 - MAT (Meridian Administration Tool)
- 364 - NMCE (CallPilot)

Certain X21 PEPs must also be installed to support CallPilot. For more information, refer to the *CallPilot General Release Bulletin*.

Other Succession 1000 requirements

Real-time engineering

CallPilot does have an impact on real time. The engineering tool performs the real-time engineering when a Succession 1000 system and CallPilot are provisioned together.

CallPilot usage of Succession 1000 software resources

Ensure that sufficient software resources are provisioned on the Succession 1000 system to support CallPilot. The software resources are, for example, ACD agents, CDNs, and voice ports. CallPilot does not share Succession 1000 resources with other applications.

The following considerations apply to the provisioning of software resources on the Succession 1000 system to support CallPilot:

- A primary CDN is required for most traffic. A secondary CDN is required for fax call answering.
- Each service that has an entry in the CallPilot Service DN table requires one phantom TN/DN.
- CallPilot uses one ACD queue to manage the hardware channels. The default DN requires a second ACD queue.
- Each channel requires an ACD agent.
- Each fax user with a virtual fax machine DN requires one phantom DN and one DID line (optional).
- Each service accessed from outside the Succession 1000 system requires one DID line.

Section C: System requirements

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Compatibility issues

Products and environments

The following table summarizes the compatibility of CallPilot 2.02 with the products and environments that it is likely to encounter.

Product	CallPilot 2.02 compatibility
Meridian Mail	The coexistence of Meridian Mail and CallPilot 2.02 on the Meridian 1 switch is supported. Networking to Meridian Mail is available with the following protocols: ■ AMIS-A ■ Enterprise Networking ■ VPIM with Meridian Mail Net Gateway **Note:** Some compatibility limitations apply.
Meridian Mail Reporter	You cannot use Meridian Mail Reporter to generate reports from a CallPilot server. Meridian Mail supports only Meridian Mail Reporter. CallPilot supports only CallPilot Reporter.
Meridian Administration Tool (MAT)	The CallPilot Application Builder client can coexist with MAT 6.1, 6.5 and 6.6 on the same PC. Refer to *Product Bulletin 99092* on the Nortel Networks web site for a detailed listing of the compatibility issues with MAT.
Custom Controlled Routing (CCR)	CCR and CallPilot can coexist on the same Meridian 1 switch. CallPilot does not support the CCR command Give IVR.

Product	CallPilot 2.02 compatibility
Symposium Call Center Server 1.x, 3.0 and 4.0; Symposium Express Call Center 1.0 and 2.0	CallPilot can coexist with Symposium Call Center Server or Symposium Express Call Center on the same ELAN and Meridian 1 switch. CallPilot 2.02 supports the following Symposium Call Center Server voice-processing script commands: ■ Give IVR ■ Give Controlled Broadcast ■ Collect Digits ■ Play Prompt ■ Open...End Voice Session However, Symposium Call Center Server 4.2 and at least performance enhancement package (PEP) SU-07 are required. CallPilot 2.02 does not integrate with Symposium Express for voice-processing script commands at this time. Refer to P*roduct Bulletin 99115* for details.
Symposium Messenger Microsoft Exchange and Outlook client	CallPilot 2.02 is compatible with these products. Symposium Messenger release 4.0.0.13 or later is recommended.
Symposium Messenger Lotus Notes client	Not supported.
Symposium Messenger Unified client	CallPilot 2.02 is compatible with the Symposium Messenger Unified client. Symposium Messenger release 4.0.0.13 or later is recommended.
Meridian Text Telephony System (MTTS)	CallPilot 2.02 does not support the MTTS at this time.

Product	CallPilot 2.02 compatibility
Internet Telephony Gateway (ITG)	The CallPilot 2.02 AMIS-A and Enterprise Networking protocols are supported with ITG release 1.1 (version 1.0.34 or later). ITG 1.1 does not support the Network Message Service (NMS) protocol. ITG 2.0 is expected to support NMS.
Microsoft Office 2000 and 2002 (Microsoft Office XP)	CallPilot 2.02 desktop messaging clients are compatible. The CallPilot 2.02 Application Builder client is compatible.

Operating systems for desktop messaging clients

The following table summarizes the compatibility of CallPilot 2.02 desktop messaging with the operating systems that it is likely to encounter.

	CallPilot 2.02 compatibility	
Product or function	**Supported**	**Not supported**
Application Builder client	■ Windows 95A or Windows 95A with service pack 1 ■ Windows 95B OEM service release 2 (OSR2) ■ Windows 98 and 98SE ■ Windows NT 4.0 Workstation with service pack 6A ■ Windows 2000 Professional with ISO-8859-1 (Latin-1) character set versions only; see the note below ■ Windows XP Professional	■ Windows ME ■ Windows NT 4.0 Workstation with service packs 1 through 6 ■ Windows NT Server 4.0 ■ Windows 2000 Server and Advanced Server ■ Dual-boot (Windows 95 and Windows NT) configurations ■ Novell NetWare Clients ■ Mac OS

Note: The ISO-8859-1 (Latin-1) character sets cover most West-European languages including, but not limited to, the following: English, French, Spanish, Catalan, Basque, Portuguese, Italian, Albanian, Rhaeto-Romanic, Dutch, German, Danish, Swedish, Norwegian, Finnish, Faeroese, Icelandic, Irish, Scottish, Afrikaans, and Swahili.

CallPilot 2.02 compatibility

Product or function	Supported	Not supported
Desktop messaging clients	■ Windows 95A or Windows 95A with service pack 1 ■ Windows 95B OSR2 ■ Windows 98 and 98SE ■ Windows NT 4.0 Workstation with service pack 6A ■ Dual-boot (Windows 95 and Windows NT) configurations ■ Non-English versions of Windows with localized client ■ Windows 2000 Professional (all clients) ■ Windows XP Professional (all clients)	■ Windows ME ■ Windows NT 4.0 Workstation with service packs 1 through 6 ■ Windows NT 4.0 Server ■ Windows 2000 Server and Advanced Server (all clients)

If desktop messaging, My CallPilot, or both are to be used, refer to *Desktop Messaging and My CallPilot Installation Guide* (555-7101-505) for more information.

Compatibility with customer e-mail environments

The following general considerations apply to the compatibility of CallPilot 2.02 with customer e-mail environments:

- CallPilot 2.02 supports clients only in Windows operating system environments.
- The CallPilot 1.07 server supports CallPilot 2.02 desktop messaging clients.
- The CallPilot 2.02 server supports CallPilot 1.07 desktop messaging, but with reduced functionality. Nortel Networks recommends that a CallPilot 2.02 desktop messaging client be used with a CallPilot 2.02 server.
- The CallPilot 2.02 server does not support CallPilot 1.05 and 1.06 desktop messaging clients.

CallPilot 2.02 Desktop Messaging supports the following e-mail clients:

Product or function	CallPilot 2.02 compatibility
Microsoft Outlook	Versions released with Windows 98, Windows 2000 and Windows XP
Novell GroupWise	Versions 5.5 and 6.x
Lotus Notes	Versions 4.6x, 5.x and 6.x (released in the first quarter of 2003)
Microsoft Outlook Express	Versions 5.x and 6.x (released with Internet Explorer 5.x and 6.x)
Microsoft Outlook 98, 2000 and 2002 (Windows XP) [Internet mail mode]	Yes
Netscape Messenger (Netscape Communicator)	Versions 6.2 and later
Qualcomm Eudora Pro	Version 5.x

Compatibility with My CallPilot Web messaging

CallPilot 2.02 My CallPilot web messaging supports the following operating systems and Internet browsers:

Product or function	CallPilot 2.02 compatibility
Server side	
Operating system	■ Windows NT Server 4.0 with service pack 6A and option pack 4 ■ Windows 2000 with service pack 1 or service pack 2
Internet service software	■ Internet Information Server 4.0 ■ Internet Information Server 5.0
Client side	
Operating system	■ Windows NT Workstation 4.0 with service pack 6A and option pack 4 ■ Windows 95B OSR2 ■ Windows 95 retail ■ Windows 98 and Windows 98SE ■ Windows 2000 Professional ■ Windows XP Professional
Internet browser	■ Netscape Communicator 6.2 and 7.0 ■ Internet Explorer 5.x with service pack 2 and Internet Explorer 6.x

The following considerations apply to the compatibility of CallPilot 2.02 with My CallPilot web messaging:

- If CallPilot desktop messaging and web messaging are installed on the same client PC, CallPilot web messaging is compatible with all CallPilot 2.02 versions of the player.
- Java script and cookies must be enabled in the web browser.
- Support for localized web browsers is available in English, French, Dutch, German, and traditional Chinese.

Server operating system and Internet browser support with My CallPilot, CallPilot Manager, and CallPilot Reporter

My CallPilot, CallPilot Manager and CallPilot Reporter in CallPilot 2.02 support the following server operating systems and Internet browsers:

Product or function	CallPilot 2.02 compatibility
Server side	
Operating system and Internet Information Server	■ Windows NT Server 4.0 with service pack 6A and Internet Information Server 4.0 ■ Windows 2000 Server with service pack 1 or service pack 2 and Internet Information Server 5.0
Client side	
Operating system	■ Windows NT Workstation 4.0 with service pack 6A ■ Windows 95B OEM OSR2 ■ Windows 95 retail ■ Windows 98 and Windows 98SE ■ Windows ME ■ Windows 2000 Professional ■ Windows XP Professional
Internet browser	■ Netscape Communicator 6.2 with proper Java J2SE extension ■ Netscape Communicator 7.0 ■ Internet Explorer 5.x and 6.x

The following general considerations apply to the support of My CallPilot, CallPilot Manager, and CallPilot Reporter in CallPilot 2.02 for server operating systems and browsers:

- When using CallPilot Reporter, the J2SE extension version 1.3.1_05 must be installed to ensure the proper operation of Java on Netscape Communicator 6.2.
- Java script and cookies must be enabled in the web browser.
- Support for localized web browsers is available in English, French, Dutch, German, and traditional Chinese.

Software feature key adapter (dongle) installation

You must install the CallPilot software feature key adapter correctly before accessing CallPilot Manager.

Network support

CLAN

The CallPilot 2.02 servers support the following CLANs:

LAN type	CallPilot 2.02 compatibility
10Base-T	All CallPilot server models
100Base-T	■ 200i server with additional hardware ■ 201i, 702t (tower), 703t (tower), and 1001rp (rackmount) without additional hardware

The following considerations apply to the CallPilot 2.02 support for CLANs:

- The connection of a 100Base-T CLAN to the 200i IPE server requires customer-supplied hardware that converts 100Base-T to 10Base-T. All the other platforms include 10/100Base-T Ethernet LAN network interface cards or controllers.
- CallPilot 2.02 does not support token ring CLANs (4 or 16 Mbit/s).

Support for WAN networking protocols

CallPilot 2.02 supports only the TCP/IP networking protocol.

CallPilot 2.02 does not support the Novell IPX/SPX protocol.

Third-party Windows NT server software and hardware

CallPilot server does not support the addition of any third-party Windows NT server software or hardware, with the exception of the approved antivirus applications. For more information, refer to the Product Bulletin 2002-035, *CallPilot Support for Anti-Virus Applications*. If you install third-party software or hardware that is not approved, then you can

- destabilize the system
- degrade the system ability to provide real-time call processing performance
- disrupt the system Y2K compliance
- cause the failure of future upgrades

For more information on this issue, refer to the Product Bulletin 99067, *CallPilot Unauthorized Hardware and Software*.

Proper power and grounding

All CallPilot 2.02 server installations, especially the installations of the 702t or 703t (tower), and 1001rp or 1002rp (rackmount) servers, must follow the switch and CallPilot guidelines for power and grounding given in Chapter 2, “Grounding and power requirements.” You must therefore implement the single-point grounding (SPG) reference requirements. If you do not follow the SPG guidelines, the electrical transients resulting from lightning and other power-ground disturbances can damage the switch and the CallPilot equipment.

The implementation of the SPG reference requirements must cover all the power devices that are attached directly to the private branch exchange (PBX) and its ancillary equipment.

In a typical CallPilot installation, the following components must be protected as indicated in the SPG guidelines:

- PBX
- CallPilot server
- UPS (if installed)

  Note: Nortel Networks strongly recommends that the tower and rackmount servers be equipped with UPSs.
- remote maintenance modem
- ELAN and CLAN hubs
- administration or maintenance PC, or both, and the associated printer(s)
- Symposium Call Center Server, if installed

Switch connectivity before running the Configuration Wizard

The CallPilot server operates properly if you ensure that the switch connectivity is configured and operational before running the Configuration Wizard. The switch connectivity configuration must include at least the following:

- the ELAN
- one or more voice channels or ACD agent TNs
- the CDN for voice messaging

Since CallPilot integrates with the switch, these resources are required to allow CallPilot services to function as designed. If you prepare a CallPilot server and configure the system before the installation at the customer location, ensure that the system has temporary switch connectivity before running the Configuration Wizard. As a result, you avoid the virtual memory low and other problem conditions that can occur.

Migration from Meridian Mail

The Meridian Mail migration utility (NTUB25AA) supports the migration from Meridian Mail systems to CallPilot 2.02 systems. The NTUB25AA migration tool supports the migration to CallPilot 2.02 from Meridian Mail Releases 11, 12, and 13 for all Meridian Mail platforms except the MSM. The NTUB25AA migration utility is required for all Meridian Mail releases, including release 13.14, as this tape supersedes the migration utility available at the TOOLS level.

You cannot use previous CallPilot 1.07 versions of the migration utility (NTUB24AA, NTUB24AB, or NTUB24AC) with CallPilot 2.02. For information about the applicable limitations, refer to the *Meridian Mail to CallPilot Migration Utility Guide* (555-7101-801).

Chapter 4

Determining system size

In this chapter

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Overview

Introduction

This chapter provides an overview of the enterprise capacity issues that you must consider before installing CallPilot. Nortel Networks provides engineering tools that calculate automatically the type of system you need on the basis of the following information that you must provide:

- the number of users
- the application usage
- the busy hour activity

System sizing

Engineering tools

The following engineering tools are available from Nortel Networks:

- Meridian Configurator (North and South America)
- NetPrice (Europe, the Middle East, Africa, and Asia)
- CallPilot Engineering Spreadsheet in Microsoft Excel format

  This spreadsheet is available in the CallPilot area of the Partner Information Center (PIC) web site at http://my.nortelnetworks.com.

System requirements

Use the engineering tools to determine the following system requirements:

- the channel requirements
- the digital signal processor (DSP) media processing unit (MPU) requirements
- the storage requirements)
- the CPU real-time requirements

The engineering tools also help you determine

- the CallPilot platform having sufficient channel, DSP, and CPU real-time capacity to meet the requirements
- the required switch channel connectivity hardware
- the required DSP hardware

Channel requirements

The number of voice, fax, and speech recognition channels required to meet the customer needs is determined by

- estimating the busy hour traffic using a parameter-driven traffic model
- looking up the corresponding channel capacity in a P05 Erlang C traffic table

The parameters available for modeling traffic are described later in this chapter. Also refer to Appendix A, “Traffic capacity tables” on page 149.

DSP MPU requirements

The DSP capacity is calculated in terms of MPUs. The engineering tool determines the required DSP processing power by using the following ratios:

- 1 MPU for each voice channel
- 2 MPUs for each fax channel
- 4 MPUs for each speech recognition channel

Storage requirements

The storage capacity is calculated in terms of hours of voice messages. The engineering tool estimates the voice message storage requirements by multiplying the number of mailboxes by the minutes of voice for each mailbox parameter.

Storage for fax is determined by multiplying the estimated number of fax pages stored by a mix of the normal and fine storage densities:

- 212 pages of normal density fax = 1 hour of voice messages
- 106 pages of fine density fax = 1 hour of voice messages

CPU real-time requirements

With the introduction of CPU-intensive services (such as E-Mail by Phone) that use host-based text-to-speech algorithms, it is now necessary to calculate the CPU load of a given set of applications. The engineering tool calculates the CPU load by

- estimating the total traffic in centum call seconds (CCS) for applications, messaging, and E-Mail by Phone services
- multiplying by load factors for each service type
- adding up the results of the estimations and calculations

CallPilot platform

CallPilot is available in three platforms: intelligent peripheral equipment (IPE), tower, and rackmount. Considering the selected platform, the engineering tool performs the following tasks:

- checks the platform capacity for channels, DSP MPUs, and CPU real-time load against the calculated requirements
- flags instances in which the platform capacity is exceeded.

Switch channel connectivity hardware

The engineering tool provisions the channel connectivity hardware that is necessary to meet the channel requirements.

DSP hardware

The engineering tool provisions the DSP hardware that is necessary to meet the DSP MPU requirements.

Customer requirements

Principal input

Customer requirements are the principal input into the engineering tools and the major driver of the system capacity. The following parameters must be determined as part of the customer requirements:

Parameter	Initial value	Minimum	Maximum	Comments
System Type (IPE, tower, rackmount)	None	Not applicable	Not applicable	The selection of any option enables all of the CallPilot inputs.
Voice Users	Blank	0	IPE systems: 8000 702t (tower): 20 000 703t (tower): 20 000 1001rp (rackmount): 20 000 1002rp (rackmount): 40 000 See “Voice User maximums” on page 96.	Enter the number of voice mailboxes.
Email by Phone Users	Blank	0	Less than or equal to the number of voice mailboxes	Enter the number of mailboxes with E-mail by Phone using text to speech.

Parameter	Initial value	Minimum	Maximum	Comments
Speech Activated Messaging	Blank	0	Less than or equal to the number of voice mailboxes	Enter the number of mailboxes with speech activated messaging (SAM).
Fax Users	Blank	0	Less than or equal to the number of voice mailboxes	Enter the number of mailboxes with Fax Messaging.
Users with Single (Voice/Fax) DN	Blank	0	Less than or equal to the number entered for Fax Users	Enter the number of fax mailboxes with a Single DN used for both voice and fax access.
Desktop Messaging	Blank	0	IPE systems: 5000 tower and rackmount systems: 20 000	Enter the number of mailboxes with desktop messaging.

Parameter	Initial value	Minimum	Maximum	Comments
Users on NMS Satellite M1s	Blank	0	Less than or equal to the number of voice mailboxes	Enter the number of mailboxes that are used by users on one or more NMS satellite locations (remote Meridian 1 switches) by way of the NMS feature. **Notes:** ■ The maximum number of NMS satellite locations is 59. ■ This field is disabled if you chose system connectivity for non-M1 switches.

Parameter	Initial value	Minimum	Maximum	Comments
Switch: (Meridian 1 or Succession 1000)	None	Not applicable	Not applicable	Select a switch to determine the setup requirements for system connectivity. If the IPE System Type is selected, then only Nortel M1 or Succession 1000 can be selected. If CallPilot is ordered in conjunction with a Meridian 1 switch, then only M1 can be selected. If CallPilot is ordered in conjunction with a Succession 1000 system, then only Succession 1000 can be selected.
Power (AC/DC)	AC	Not applicable	Not applicable	The AC and DC power options are available for the rackmount systems. The tower systems are available only with AC, but selecting DC causes the configuration tool to provision a DC power inverter. The power option is not applicable to IPE systems.

Parameter	Initial value	Minimum	Maximum	Comments
Number of Voice Menu Applications	2	0	2500	Enter the number of voice applications created by Application Builder.
Number of Fax On Demand Applications	0	0	2500	Enter the number of Fax On Demand applications created by Application Builder.
Number of Symposium Channels	0	0	Maximum number of voice channel capacity for the selected platform	Enter the number of voice channels that are dedicated for use by the Symposium Call Center Server.

Voice User maximums

The Voice User maximums are the limits to software right-to-use (RTU) licences only. That is, the number associated with the Voice User parameter (such as 8000, 20 000 and 40 000) represents the maximum number of mailboxes that can be configured on a platform; see page 92. The actual limit to the number of voice users that a CallPilot system can support at an adequate service level is affected by many factors and can be determined only with an engineering tool.

Channel requirements

Overview of channel types

CallPilot provides three types of media channels: voice, fax, and speech recognition.

- The voice channels support voice services, such as Voice Messaging.
- The fax channels can support both voice and fax services, such as Fax on Demand.
- The speech recognition channels can support voice, fax, and SAM services.

Sizing the number and type of channels

The engineering tools perform the following steps:

1. Estimate the busy hour value in CCSs for each channel type.
2. Look up the channel requirements in the Erlang C P05 traffic table (see “CCS values and channel requirements table” on page 151).

You can determine the traffic levels using one of the following factors:

- default assumptions in the system sizing tools
- estimations and/or measures of calls and faxes for each day

Default assumptions in the system sizing tools

The system sizing tools contain default assumptions for typical business usage levels for voice, fax, and SAM services. The traffic modeling parameters and their default values are covered later in this section. Use the default values of the traffic modeling parameters to obtain the overall channel sizing for various user populations.

The percentages of feature usage stated in 2 and 3 on pages 98 and 99 depend on the nature of the customer business and are not necessarily exact. Also, light or infrequent users of these features can be disregarded from a system engineering standpoint.

1. Channel requirements for users without multimedia features:

Users	Voice	Fax	Speech recognition
100	4	0	0
200	6	0	0
500	12	0	0
1000	20	0	0
2000	36	0	0
5000	72	0	0

2. Channel requirements for users with the following multimedia feature usage:

   - 10% Mobile User (SAM and E-mail By Phone)
   - 20% Fax Messaging
   - 50% Desktop Messaging

Users	Voice	Fax	Mobile user
100	4	2	2
200	6	4	2
500	12	6	4
1000	18	8	4
2000	32	14	6
5000	Not supported because more than 96 MPUs are required.		

3. Channel requirements for users with the following multimedia feature usage:
   - 25% Mobile User (SAM and E-mail by Phone)
   - 50% Fax Messaging
   - 100% Desktop Messaging

Users	Voice	Fax	Mobile user
100	4	4	2
200	6	6	4
500	10	10	4
1000	18	16	6
2000	Not supported because more than 96 MPUs are required.		
5000	Not supported because more than 96 MPUs are required.		

Estimates or measures of calls/faxes for each day

If existing traffic reports are not available, but average numbers of calls or faxes for each day are known or estimated, then you can determine the number of calls or faxes during the peak busy hour using this formula:

Peak Hour Traffic = 13% of daily traffic

Voice traffic services

Principal services

The principal services that generate traffic on voice channels are as follows:

- Voice Call Answering Service
- Voice Logon (Mail) Service
- E-mail by Phone on Voice channels
- Application Builder services
  - Voice Menus
  - Auto Attendants
- Fax On Demand requests
- Outcalling (Remote Notification and Delivery to Telephone)
- Networking (Enterprise and AMIS)

Provisioning voice channels on CallPilot

Customers often purchase CallPilot to replace an existing voice mail system. If the port capacity on the existing voice mail system provided satisfactory service levels, then you must simply provision the same number of voice channels on CallPilot without engineering the solution. Enter the number of voice channels in the Voice Channels Override parameter of the Meridian Configurator or NetPrice tool.

If a single CallPilot system replaces two or more voice mail systems, then it is not necessary to provision as many voice channels on the CallPilot system as on all the voice mail systems that CallPilot replaced, since larger systems have increased traffic efficiency. When a single CallPilot server replaces two or more systems, Nortel Networks recommends using the engineering tool to size the channel requirements on the basis of the number of CallPilot users.

Modeling busy hour voice traffic

The table below presents the parameters that are used in calculating the traffic estimation for each of the principal voice traffic services in hours. The engineering tools consider these parameters to be advanced parameters. The sales engineer generally leaves the advanced parameters unchanged. However, the engineering tools uses the advanced parameters to enable the sales engineer to adapt the traffic model to the needs and behavior of the customer.

Field name	Initial value	Minimum	Maximum	Comments
Voice Call Answering Session Calls	0.4	0.1	5	Enter the number of call answering calls in the busy hour (BH) for each mailbox.
Voice Call Answering Session AHT	40	10	200	Enter the average hold time (AHT) in seconds for the BH.
Voice Logon Session AHT	70	10	300	Enter the AHT in seconds for the BH.
Total Busy Hour Message Access	0.35	0.1	1.0	Enter the number of expected single message retrievals from all potential modes (DTMF, SAM, and Desktop) for each mailbox during the BH.
EBP Session AHT	240	10	600	Enter the E-mail by Phone session AHT in seconds for the BH.
Pct DTMF Voice Mail Accesses using EBP	10%	00	100	Enter the percentage of dual-tone multifrequency (DTMF) logons that use E-mail by Phone.

Field name	Initial value	Minimum	Maximum	Comments
Voice Menus Calls	5	1	200	Enter the number of calls for each voice menu application in the BH.
Voice Menus AHT	60	5	200	Enter the AHT in seconds for the BH.
Voice Menus: %Xfrd	33	0	100	Enter the percentage of voice menu calls that will be transferred.
Auto Attendant Calls	40	5	1000	Enter the number of auto attendant calls in the BH.
Auto Attendant AHT	30	5	90	Enter the AHT in seconds for the busy hour.
Fax On Demand Request Calls	2	1	200	Enter the number of request calls (on voice channels) for each Fax On Demand application in the BH.
Fax On Demand Requests AHT	60	5	200	Enter the AHT for fax requests in seconds.
Outcalling (RN and DTT)% of Calls	5%	0	100	Enter the percentage of Voice Call Answering calls (%Calls) that can result in Outcalling calls.

Field name	Initial value	Minimum	Maximum	Comments
Outcalling (RN and DTT) AHT	60 sec.	10	180	Enter the AHT in seconds.
Analog Networking Percentage	3%	0	100%	Enter the percentage of analog messaging traffic (Enterprise or AMIS networking). The more VPIM Networking is used, the lower this percentage must be. If VPIM is the only networking protocol used, then set this parameter to zero.

Fax traffic services

Principal services

The principal services that generate traffic on fax channels are the following:

- Fax on Demand applications with same call fax access
- Fax on Demand fax callback delivery
- Fax auto attendant (fax express messaging)
- Fax call answering
- Delivery to fax services
- Fax broadcasting (multicast to fax service)

Estimating fax channels

Nortel Networks does not recommend that you simply count the number of existing fax machines and replace them with fax channels on a one-for-one basis, especially when replacing a small number of fax machines that have high inbound traffic with fax channels. Instead, Nortel Networks recommends you to estimate the average number of

- fax messages for each fax user
- pages for each fax message

Enter the estimated average numbers into the advanced parameters of the engineering tool.

Modeling busy hour fax traffic

The table below presents the parameters that are used in calculating the traffic estimation for each of the principal fax services. The engineering tools consider these parameters to be advanced parameters. The sales engineer generally leaves the advanced parameters unchanged. However, the engineering tools uses the advanced parameters to enable the sales engineer to adjust the traffic model to the needs and behavior of the customer.

Field name	Initial value	Minimum	Maximum	Comments
Fax Messaging Calls	0.1	0.05	1000	Enter the number of Fax Messaging calls within the BH for each mailbox.
Fax Messaging Pages	3	1	100	Enter the average number of pages for fax messaging within the BH.
Fax Printing Displaced By Desktop	90%	10	100	Enter the percentage of fax printing that is displaced by users who read the messages on the desktop instead of printing the message.
Fax On Demand—Call Back Calls	2	1	200	Enter the number of calls that can be made by the Call Back feature for each fax on demand application during the BH.
Fax On Demand—Call Back Pages	4	0	99	Enter the number of pages that can be sent by way of the Call Back feature.

Field name	Initial value	Minimum	Maximum	Comments
Fax Broadcast Recipients	Blank	0	5000	Enter the number of fax broadcast recipients. Set this parameter to a non-zero value only if broadcasts are to occur during the BH.
Fax Broadcast Max Wait time	4	0.2	20	Enter the maximum wait time (in hours) that is necessary to deliver the fax broadcast to all recipients.
Fax Broadcast Pages	3	1	100	Enter the average number of pages for each fax broadcast message.

Speech recognition traffic services

Principal services

The principal services that generate traffic on speech recognition channels are the following:

- speech activated messaging
- E-mail By Phone on speech recognition channels

The principal services provide hands-free and eyes-free access to voice and e-mail messages. These services are typically used by mobile users from wireless phones.

Modeling busy hour speech recognition traffic

The table below presents the parameters that are used in calculating the traffic estimation for each of the principal speech recognition traffic services. The engineering tools consider these parameters to be advanced parameters. The sales engineer generally leaves the advanced parameters unchanged. However, the engineering tools uses the advanced parameters to enable the sales engineer to adapt the traffic model to the needs and behavior of the customer.

Field name	Initial value	Minimum	Maximum	Comments
Speech Activated Messaging Session AHT	75	10	300	Enter the AHT (in seconds) for SAM sessions.

Field name	Initial value	Minimum	Maximum	Comments
Telset Accesses Via SAM	70%	10	100	The BH users of SAM are either desktop or SAM users away from their desks, or SAM users without desktop messaging rights. The SAM users prefer SAM to DTMF, yet some SAM users can use DTMF logons in environments where it is inappropriate to speak commands; for example, in open cubicles. The value of this parameter reflects the likelihood that a user with SAM rights, who must access messages using a phone set, chooses SAM over DTMF.
Pct SAM Accesses with EBP	20%	00	100	Enter the percentage of time that users access Email by Phone by way of a SAM session.

Storage hour estimation

Storage calculation assumptions

The engineering tools make the following assumptions when calculating storage:

- one page of normal fax = 1/212 hour
- one page of fine resolution fax = 1/106 hour
- voice storage overhead factor = 20% of voice stored
- average voice message length = 1 minute

The following parameters are used in calculating the storage hours:

Field name	Initial value	Minimum	Maximum
Minutes of voice messages for each mailbox	6	1	100
Pages of fax for each mailbox	5	1	100

Chapter 5

Engineering the server

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CallPilot server capacities at a glance

The following table summarizes the CallPilot server capacities. For information on other capacities and features, refer to the appropriate server section in this chapter.

Item	200i	201i	702t	703t	1001rp	1002rp
Channels	24	40	96	96	96	96
DSP MPU	24	40	96	96	96	96
Storage hours[a]	200	350	1 000	1 200	1 000	2 400
Maximum number of mailboxes[b]	8 000	10 000	20 000	20 000	20 000	50 000
Maximum number of voice-only users[c]	1 400	2 500	7 000	20 000	7 000	7 000
Maximum number of logged in unified messaging users[d e f]	1 200	2 200	5 800	12 200	5 800	12 200
RAID (level 1 hardware mirroring only)	Not supported	Not supported	Optional	Standard	Standard	Standard
Disks ■ Hot swappable? ■ Redundant?	 ■ No ■ No	 ■ No ■ No	 ■ No ■ Optional	 ■ No ■ Yes	 ■ Yes ■ Yes	 ■ Yes ■ Yes

Item	200i	201i	702t	703t	1001rp	1002rp
Power supply fans	Not applicable	Not applicable				
■ Hot swappable?			■ No	■ No	■ Yes	■ Yes
■ Redundant?			■ No	■ No	■ Yes	■ Yes

a. The storage hours do not include the storage reserved for voice prompts.
b. The maximum number of mailboxes that can be created on a system. However, this is not necessarily the number of users who can practically use the system.
c. The maximum number of voice-only users, with typical voice mail usage, that can be supported with a P05 grade of service with all voice channels. User capacity is lower if fax or mobile user features are configured. Use the Meridian Configurator or NetPrice tool in all cases to obtain an engineered solution.
d. This limit is not enforced.
e. The maximum number of unified messaging clients that can be logged on at one time. This is not the keycode limit. The keycode limit for desktop messaging is the same as the maximum limit for mailboxes.
f. The value represents the maximum number of mailboxes for the platform minus the number of mailboxes implemented.

CallPilot product capacities

Overview

The product capacities provided in the table below are given as reference values. The footnotes at the bottom of the table indicate the special conditions that can apply to a specific item.

Item	Limit
Number of Application Builder services	2500[a]
Levels of imported applications in 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
Voice messages per mailbox	1000
Minutes per mailbox	360
SDNs (previously known as Voice Service DNs)[b]	1500
Minutes of voice per message	120
Pages of fax per message	500
Number of voice prompt languages	6
Number of speech recognition languages[c]	3
Number of shared distribution lists (SDL)	500
Entries per shared distribution list	999

Item	Limit
Number of personal distribution lists (PDL) per mailbox	99
Entries per personal distribution list	200
Selections per fax on each fax on demand session	99
Pages per fax selection	99
User greeting length (each) in minutes	10
Seconds for a Personal Verification or Site Spoken Name	30
System greeting length in minutes	10
Maximum announcement length in minutes	10
Classes of service	Not applicable
Number of temporary remote user references	1000
Private network sites	500
Open VPIM shortcut network sites	500
Number of CDP steering codes per network location	500
Number of NMS satellite locations	59
Tenants	1
Customers	1
Restriction Permissions Lists[d]	200
DNs per mailbox	8
Number of concurrent administration sessions	16

Item	Limit
Maximum simultaneous E-mail by Phone sessions	20
Maximum E-Mail by Phone languages	10

a. This limit is for tower and rackmount systems only. In these configurations, drive D: supports 500 services. Each of drives E: and F: supports 1000 services. The IPE platforms support only up to 500 services.
b. The SDN actual limit is not enforced. Each entry also requires that a phantom DN be defined on the switch.
c. The voice prompt and speech recognition languages must be identical.
d. Each list contains up to 30 restriction and 30 permission codes.

200i server features

Introduction

You must be familiar with 200i server capacities to ensure that the 200i server meets your requirements. The 200i server is no longer a currently shipped product, but it is in sustained status.

Switch connectivity

The 200i server supports connectivity to a Meridian 1 or Succession 1000 system. The 200i server occupies two slots in either system.

From the switch perspective, the 200i server appears logically equivalent to one extended digital line card (XDLC).

DSPs and MPUs

The 200i server contains one embedded digital signaling processor (DSP) providing support for eight media processing units (MPU). Two MPC-8 cards inserted into the server faceplate support 16 additional MPUs, for a total of 24 MPUs on the server. Each MPC-8 card provides eight MPUs.

Hard disk and volume capacities

The 200i server contains one system volume (VS1), which is on the system hard disk. The VS1 contains system prompts, user personal verifications, network message queues, and user mailboxes.

The 200i server supports a single integrated drive electronics (IDE) hard disk with 200 hours of storage.

Data port provisioning

The 200i server has only one serial port, identified as COM1. You can use the COM1 port to connect the server to an external modem for remote access (particularly for remote technical support). A 9-pin RS-232 connector on the external I/O breakout panel provides the connection to the COM1 port.

The 200i server does not have a parallel port. In contrast to the other CallPilot servers, the software feature key (dongle) is installed on the motherboard.

LAN connectivity

The 200i server provides connectivity to the LAN as follows:

- A built-in 10Base-T Ethernet controller on the 200i server motherboard provides connectivity to the embedded LAN (ELAN).

  For important information about using the ELAN in your network, see “About the ELAN” in the *Part 1: Installation and Maintenance Overview* document for the 200i server.

- An optional PCMCIA network interface card (NIC) can be installed on the motherboard to provide 10 Mbit/s Ethernet connectivity to the customer LAN (CLAN).

  The CLAN is required only for systems that require another network connection in addition to the ELAN connection. The CLAN provides data connectivity between desktop and web messaging clients, administrative PCs, and the CallPilot server.

Network requirements

The appropriate networking equipment must be available for both the CLAN and ELAN.

The CLAN and ELAN must be properly configured for correct CallPilot operation. To ensure that the proper configuration is implemented, Nortel Networks recommends that you consult a network specialist.

Remote access connectivity

The RS-232 COM1 connector on the external I/O breakout panel provides the connection to an external modem. The modem allows administrators and technical support personnel to administer the CallPilot server from a remote location.

Microsoft Windows NT Remote Access Service (RAS) is used to establish the remote access connection to the server. The Symantec pcAnywhere remote-control software is then used to control the server over the RAS connection.

201i server features

Introduction

You must be familiar with 201i server capacity to ensure that the 201i server meets your requirements.

Switch connectivity

The 201i server supports connectivity to a Meridian 1 or Succession 1000 system. The 201i server occupies two slots in either system.

From the switch perspective, the 201i server appears equivalent to two MGate cards.

DSPs and MPUs

The 201i server contains one embedded DSP providing support for eight MPUs. Four MPC-8 cards inserted into the server faceplate support 32 additional MPUs, for a total of 40 MPUs on the server. Each MPC-8 card provides eight MPUs.

Hard disk and volume capacities

The 201i server contains one system volume (VS1), which is on the system disk. The VS1 contains system prompts, user personal verifications, network message queues, and user mailboxes.

The 201i server supports a single IDE hard drive with 350 hours of storage.

Data port provisioning

The 201i server has only one serial port, identified as COM1. You can use the COM1 port to connect the server to an external modem for remote access (particularly for remote technical support). A 9-pin RS-232 connector on the multiple I/O cable provides the connection to the COM1 port.

The 201i server does not have a parallel port. In contrast to the other CallPilot servers, the software feature key (dongle) is installed on the motherboard.

LAN connectivity

Two Ethernet controllers on the motherboard of the 201i server provide connectivity to the Ethernet network as follows:

- A built-in 10Base-T Ethernet controller on the 201i server motherboard provides Ethernet connectivity to the ELAN. The ELAN carries call processing traffic between the CallPilot server and the Meridian 1 switch or Succession 1000 system.

  For important information about using the ELAN in your network, see “About the ELAN” in the *Part 1: Installation and Maintenance Overview* document for the 201i server.

- A built-in Ethernet controller on the 201i server motherboard provides 10/100Base-T Ethernet connectivity to the CLAN. The CLAN provides data connectivity between desktop and web messaging clients, administrative PCs, and the CallPilot server.

Network requirements

The appropriate networking equipment must be available for both the CLAN and ELAN.

The CLAN and ELAN must be properly configured for correct CallPilot operation. To ensure that the proper configuration is implemented, Nortel Networks recommends that you consult a network specialist.

Remote access connectivity

The RS-232 COM1 connector on the multiple I/O cable provides the connection to an external modem. The modem allows administrators and technical support personnel to administer the CallPilot server from a remote location.

The Microsoft Windows NT RAS is used to establish the remote-access connection to the server. The Symantec pcAnywhere remote-control software is then used to control the server over the RAS connection.

702t server features

Introduction

You must be familiar with the 702t server capacity to ensure that the 702t server meets your requirements.

MPB16-4 boards and MPC-8 cards

The 702t server supports the MPB16-4 board, which has two onboard DSPs. Each onboard DSP supports eight channels. Four additional slots on the board allow you to insert 4 MPC-8 cards supporting 32 additional channels, for a total of 48 channels for each MPB16-4 board. You can insert a maximum of two MPB16-4 boards into the 702t server.

A single MPB16-4 board provides two DS30X connections. Each DS30X connection is linked to an MGate card in the switch. Each MGate card provides 32 channels. Therefore, 3 MGate cards support 96 channels.

Hard disks

The 702t server is supplied with three hard disks, which provide a total of 1000 hours of storage capacity. If the redundant array of independent disks (RAID) option is installed, then the number of disks is increased to six, while the storage capacity remains at 1000 hours.

You must order the RAID option when the system is new. The RAID option cannot be added after the 702t server is installed.

Volume capacity

The 702t server contains one system volume (VS1), which is on the system hard disk. The user volumes (VS102 and VS103) are located on separate hard disks configured on the server.

The following table shows the recommended number of storage hours for each volume:

Volume	Storage hours
VS1	200
VS102	400
VS103	400

Data port provisioning

The 702t server has two serial ports. One serial port supports an external modem (particularly for remote technical support) and the other is a spare port.

The parallel port on the 702t server is dedicated to the software feature key (dongle).

LAN connectivity

The 702t server provides 10Base-T or 100Base-T Ethernet network connectivity as follows:

- An Ethernet controller on the 702t motherboard provides connectivity to the ELAN.

  For important information about using the ELAN in your network, see “About the ELAN” in the *Part 1: Installation and Maintenance Overview* document for the 702t server.

- An optional NIC is installed in the server.

  The optional NIC is necessary only for systems that require a CLAN connection in addition to the ELAN connection. The CLAN provides data connectivity between desktop and web messaging clients, and the CallPilot server.

Network requirements

Appropriate networking equipment must be available for both the CLAN and ELAN.

The CLAN and ELAN must be properly configured for correct CallPilot operation. To ensure that the proper configuration is implemented, Nortel Networks recommends that you consult a network specialist.

Remote access connectivity

The RS-232 COM1 connector on the rear of the CallPilot server provides the connection to an external modem. The modem allows administrators and technical support personnel to administer the CallPilot server from a remote location.

Microsoft Windows NT RAS is used to establish the remot-access connection to the server. The Symantec pcAnywhere remote-control software is then used to control the server over the RAS connection.

703t server features

Introduction

You must be familiar with the 703t server capacity to ensure that the 703t server meets your requirements.

MPB96 board

The 703t server currently supports only one MPB96 board. The MPB96 board has 12 onboard DSPs and provides a total of 96 channels.

The MPB96 board provides three DS30X connections. Each DS30X connection is linked to an MGate card installed in the switch. Each MGate card provides 32 channels. Therefore, 3 MGate cards support 96 channels.

Hard disks

The 703t server is supplied with two hard disks in a RAID configuration: one disk is primary and the other disk is redundant. The 703t server offers 1200 hours of storage capacity. The hard disks are not hot swappable.

Volume capacities

The 703t server contains one system volume (VS1), which is on the system disk. User volumes VS102 and VS103 are also on the system disk.

The following table shows the recommended number of storage hours for each volume:

Volume	Storage hours
VS1	400
VS102	400
VS103	400

Data port provisioning

The 703t server has two serial ports, but only one serial port is installed. This serial port is used to support an external modem for remote access (particularly for remote technical support).

The parallel port on the 703t server is dedicated to the software feature key (dongle).

LAN connectivity

The 703t server contains two Ethernet controllers on the motherboard that provide connectivity to the Ethernet network as follows:

- The 10Base-T or 100Base-T Ethernet controller provides network connectivity to the ELAN.

  For important information about using the ELAN in your network, see “About the ELAN” in the *Part 1: Installation and Maintenance Overview* document for the 703t server.

- The 10Base-T, 100Base-T, or 1000Base-T Ethernet controller provides connectivity to the CLAN.

  The CLAN is necessary only for the systems that require another network connection in addition to the ELAN connection. The CLAN provides data connectivity between desktop and web messaging clients, administrative PCs, and the CallPilot server.

Network requirements

Appropriate networking equipment must be available for both the CLAN and ELAN.

The CLAN and ELAN must be properly configured for correct CallPilot operation. To ensure that the proper configuration is implemented, Nortel Networks recommends that you consult a network specialist.

Remote access connectivity

The RS-232 COM1 connector on the rear of the CallPilot server provides the connection to an external modem. The modem allows administrators and technical support personnel to administer the CallPilot server from a remote location.

Microsoft Windows NT RAS is used to establish the remote access connection to the server. The Symantec pcAnywhere remote-control software is then used to control the server over the RAS connection.

1001rp server features

Introduction

You must be familiar with 1001rp server capacities to ensure that the 1001rp server meets your requirements. The 1001rp server is no longer a currently shipped product for application with Meridian 1 and Succession 1000 systems, but it is in sustained status.

MPB16-4 boards and MPC-8 cards

The 1001rp server supports the MPB16-4 board, which has 2 onboard DSPs providing 16 channels. Four additional slots on the board allow you to insert 4 MPC-8 cards providing 32 additional channels, for a total of 48 channels for each MPB16-4 board. You can insert a maximum of two MPB16-4 boards into the server.

A single MPB16-4 board provides two DS30X connections. Each DS30X connection is linked to an MGate card installed in the switch. Each MGate card provides 32 channels. Therefore, 3 MGate cards support 96 channels.

Hard disks

The 1001rp server is supplied with six hard disks in a RAID configuration. Three disks are primary and the other three disks are redundant. The 1001rp server offers a total of 1000 hours of storage capacity. The hard disks are hot swappable.

Volume capacities

The 1001rp server contains one system volume (VS1), which is on the system disk. The user volumes (VS102 and VS103) are located on separate hard disks that are configured on the server.

The following table shows the recommended number of storage hours for each volume:

Volume	Storage hours
VS1	200
VS102	400
VS103	400

Data port provisioning

The 1001rp server has two serial ports. One serial port is used to support an external modem (particularly for remote technical support) and the other is a spare port.

The parallel port on the 1001rp server is dedicated to the software feature key (dongle).

LAN connectivity

The 1001rp server provides 10Base-T or 100Base-T Ethernet connectivity through NICs installed in the server as follows:

- One NIC provides connectivity to the ELAN.

  For important information about using the ELAN in your network, see “About the ELAN” in the *Part 1: Installation and Maintenance Overview* document for the 1001rp server.

- The second NIC is optional.

  The optional NIC is necessary only for systems that require a CLAN connection in addition to the ELAN connection. The CLAN provides data connectivity between desktop and web messaging clients, administrative PCs, and the CallPilot server.

Network requirements

Appropriate networking equipment must be available for both the CLAN and ELAN.

The CLAN and ELAN must be properly configured for correct CallPilot operation. To ensure that the proper configuration is implemented, Nortel Networks recommends that you consult a network specialist.

Remote access connectivity

The RS-232 COM1 connector on the rear of the CallPilot server provides the connection to an external modem. The modem allows administrators and technical support personnel to administer the CallPilot server from a remote location.

Microsoft Windows NT RAS is used to establish the remote access connection to the server. The Symantec pcAnywhere remote-control software is then used to control the server over the RAS connection.

1002rp server features

Introduction

You must be familiar with 1002rp server capacities to ensure that the 1002rp server meets your requirements.

MPB16-4 boards and MPC-8 cards

The 1002rp server supports the MPB16-4 board, which has 2 onboard DSPs providing 16 channels. Four additional slots on the board allow you to insert 4 MPC-8 cards providing 32 additional channels, for a total of 48 channels for each MPB16-4 board. You can insert a maximum of two MPB16-4 boards into the server.

A single MPB16-4 board provides two DS30X connections. Each DS30X connection is linked to an MGate card in the switch. Each MGate card provides 32 channels. Therefore, 3 MGate cards support 96 channels.

Hard disks

The 1002rp is supplied with six hard disks in a RAID configuration. Three disks are primary and the other three disks are redundant. The 1002rp server offers 2400 hours of storage capacity. The hard disks are hot swappable.

Volume capacities

The 1002rp server contains one system volume (VS1), which is on the system disk. The user volumes (VS102 and VS103) are located on separate hard disks that are configured on the server.

The following table shows the recommended number of storage hours for each volume:

Volume	Storage hours
VS1	500
VS102	950
VS103	950

Data port provisioning

The 1002rp server has two serial ports. One serial port is used to support an external modem (particularly for remote technical support), and the other is a spare port.

The parallel port on the 1002rp server is dedicated to the software feature key (dongle).

LAN connectivity

The 1002rp server has two onboard Ethernet connections for NICs on the single board computer (SBC) card:

- One NIC provides connectivity to the ELAN.

  For important information about using the ELAN in your network, see “About the ELAN” in the *Part 1: Installation and Maintenance Overview* document for the 1002rp server.

- A second NIC is optional.

  The optional NIC is necessary only for systems that require a CLAN connection in addition to the ELAN connection. The CLAN provides data connectivity between desktop and web messaging clients, and the CallPilot server.

Network requirements

Appropriate networking equipment must be available for both the CLAN and ELAN.

The CLAN and ELAN must be properly configured for correct CallPilot operation. To ensure that the proper configuration is implemented, Nortel Networks recommends that you consult a network specialist.

Remote access connectivity

The RS-232 COM1 connector on the rear of the CallPilot server provides the connection to an external modem. The modem allows administrators and technical support personnel to administer the CallPilot server from a remote location.

Microsoft Windows NT RAS is used to establish the remote access connection to the server. The Symantec pcAnywhere remote-control software is then used to control the server over the RAS connection.

Chapter 6

Selecting a site

In this chapter

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CallPilot power supply requirements 142

Environmental specifications for the CallPilot servers 145

Space requirements for the CallPilot server

Introduction

You must consider the physical space occupied by the CallPilot server as part of your planning activities. This section provides guidelines for determining the adequate space that must be provided for the servers.

General requirements

Locate the CallPilot server in an area that is

- not exposed 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)

  Note: The following sources can cause EMI:

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

Space requirements for the server

Install the server in an area where technicians have enough access room at the front and rear of the server to service the server components. Therefore, install the server in an area that provides

- enough space for the front and rear cabinet doors to open and close
- extra access room for the servicing and removal of components

Planning the switch room space

When you plan for the installation and access space that is needed for the CallPilot server and peripherals, also consider the space required in the switch room.

ELAN

Ensure that sufficient space is available for the Ethernet hub and cables.



ATTENTION!

To comply with the electromagnetic compliance requirements, the Ethernet hub must be located in a different room than the CallPilot 703t server.

Peripheral devices

You must ensure that sufficient space is available for the following peripheral devices:

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

Note: The monitor, keyboard, and mouse must not remain connected to the 200i or 201i server permanently.

200i and 201i servers

Each of the 200i and 201i intelligent peripheral equipment (IPE) servers occupies two slots in the IPE shelf of the switch, and weigh approximately 2.1 kg (4.6 lb).

You must ensure that sufficient space is available for

- the I/O breakout panel (200i server) or the multiple I/O cable (201i server)
- the tape drive
- the CD-ROM drive

702t server

The 702t server is freestanding. The following table lists the characteristics of the 702t server:

Characteristic	Value
Height	49 cm (19.3 in.)
Width	21 cm (8.3 in.)—chassis only 26 cm (10 in.)—with chassis feet
Depth (distance from front to back)	45 cm (17.75 in.)
Clearance	■ front: 21.59 cm (8.5 in.) ■ rear: 12.70 cm (5 in.) ■ side: 7.62 cm (3 in.)—additional side clearance is required for service
Weight of fully loaded system with ■ six small computer system interface (SCSI) drives ■ six populated boards ■ CD-ROM drive ■ floppy drive ■ tape drive	22.05 kg (48.50 lb)

A 10-m (33-ft) cable connects the 702t server to the IPE shelf of the Meridian 1 switch.

703t (tower) server

The 703t server is freestanding. The following table lists the characteristics of the 703t server:

Characteristic	Value
Height	42 cm (16.75 in.)—chassis only 44 cm (17.5 in.)—with chassis feet
Width	21.5 cm (8.6 in.)—chassis only 32 cm (12.7 in.)—with chassis feet
Depth (distance from front to back)	65 cm (26 in.)
Clearance	■ front: 25 cm (10 in.) ■ rear: 12.5 cm (5 in.) ■ side: 7.5 cm (3 in.)—additional side clearance is required for service ■ top: 7.5 cm (3 in.)
Weight of fully loaded system with ■ two SCSI drives ■ six populated boards ■ CD-ROM drive ■ floppy drive ■ tape drive	Approximately 22 kg (48.5 lb)

A 20-m (60-ft) cable connects the 703t server to the IPE shelf of the Meridian 1 switch.

1001rp and 1002rp servers

Each 1001rp or 1002rp server is installed in a customer-supplied shelf. The following table lists the shelf characteristics:

Characteristic	Value
Height	32 cm (12.5 in.)
Width	48.3 cm (19 in.)
Depth (distance from front to back)	■ without front bezel: 49.5 cm (19.5 in.) ■ with front bezel: 53.3 cm (21 in.)
Weight of fully loaded system with ■ six SCSI drives ■ CD-ROM drive ■ floppy drive ■ tape drive	45.5 kg (100 lb)

A 10-m (33-ft) cable connects the rackmount servers to the IPE shelf of the Meridian 1 switch.

Administrative PC

Any suitable PC that can access the CallPilot CLAN or ELAN can serve as an administrative PC. Administration is performed through the CallPilot Manager web-based interface.

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 power supply requirements.

Single-point grounding



WARNING

Risk of personal injury and risk of hardware failure

The power outlets that are used by the CallPilot server and peripheral devices must be connected to the same single point ground (SPG) reference as the one used by the Meridian 1 switch or Succession 1000 system that contains MGate cards connected to the CallPilot server.

If this requirement is not met, power transients can cause personal injury, hardware failure, or both.

Nortel Network strongly recommends that a qualified electrician establish the proper SPG before the installation of the CallPilot server.

For more information on the SPG reference, refer to Chapter 2, “Grounding and power requirements.”

UPS recommendations

Nortel Networks recommends using an uninterruptible power supply (UPS) or an equivalent device to power the CallPilot server. The UPS provides two important services that are essential to maintaining high-availability and mission-critical messaging:

1. The UPS conditions the power by filtering power brown-outs and transients, which can shorten the server life and damage the server hardware.
2. The UPS greatly reduces the risk of unplanned power outages, which can corrupt severely the operating system components of the server.

If a UPS protects the switch, then Nortel Networks recommends using a UPS to power the ELAN hub to prevent service loss due to power outages.

CallPilot server power requirements

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

Device	Power input	Power usage
200i and 201i	Provided by the Meridian 1 IPE shelf	40 W
702t	120 V AC 240 V AC	300 W
703t	Auto-ranges from 90 V AC to 120 V AC and from 200 V AC to 240 V AC at 50 Hz or 60 Hz	450 W
1001rp AC	120 V AC 240 V AC	400 W

Device	Power input	Power usage
1001rp DC	48 V, 20 A DC See the note that follows this table.	500 W
1002rp AC	120 V AC 240 V AC	400 W
1002rp DC	48 V, 20-A DC See the note that follows this table.	500 W
ELAN hub	110 V	1.8 W
External tape drive	110 V	7.2 W
MGate card	Provided by the Meridian 1 IPE shelf or by the Succession 1000 system	5 W
Modem	110V by way of a power adapter that provides 9-15 V AC at 10 W	10 W
Monitor	110 VAC	90 W

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

Environmental specifications for the CallPilot servers

Introduction

Always consider the environmental specifications of the CallPilot servers when planning an adequate location for the servers.

However, before considering the server environmental specifications, you must take into account the switch environmental specifications.

The proper temperature and humidity are important for the longevity of the servers. The tables in the following sections summarize the key environmental specifications of the CallPilot servers.

Specifications for the 200i and 201i servers

Parameter	Condition	Specification
Temperature	Recommended temperature	15°C to 30°C (59°F to 86°F)
	Absolute temperature	10°C to 45°C (50°F to 113°F)
	Long-term storage temperature	-20°C to 60°C (-4°F to 140°F)
	Short-term storage temperature	-40°C to 70°C (-40°F to 158°F) for less than 72 hours
	Change rate temperature	less than 1°C (1.8°F) for each period of 3 minutes
Humidity	Recommended relative humidity (RH)	20% to 55% RH (non-condensing)
	Absolute RH	20% to 80% RH (non-condensing)
	Long-term storage relative humidity	5% to 95% RH (at -40°C to 70°C [-40°F to 158°F]), non-condensing

Specifications for the 702t server

The “non-operating” term used in the table refers to the environmental conditions that have to be maintained during shipping, storage, or both.

Environmental condition	Specification
Operating temperature	10°C to 35°C (50°F to 95°F) The maximum rate of change must not exceed 10°C (18°F) for each hour.
Non-operating temperature	-40°C to +70°C (-40°F to 158°F)
Non-operating humidity	95%, non-condensing, at 30°C (86°F)

Environmental condition	Specification
Acoustic noise	less than 45 dBA at typical office ambient temperature: 18° to 22°C (64°F to 72°F)
Operating shock	No errors with a half sine wave shock of 2 G (with 11 millisecond duration)
Package shock	The system is operational after a 76.2-cm (30-in.) free fall. Cosmetic damage can be present.
Electrostatic discharge	200 KV, as indicated in the Intel Environmental test specification; only to 15 KV for the CD-ROM drive

703t server specifications

The “non-operating” term used in the table refers to the environmental conditions that have to be maintained during shipping, storage, or both.

Environmental condition	Specification
Operating temperature	10°C to 35°C (50°F to 95°F) The maximum rate of change must not exceed 10°C (18°F) for each hour.
Non-operating (storage) temperature	-40°C to 70°C (-40°F to 158°F)
Non-operating humidity	95%, non-condensing at 30°C (86°F)
Altitude	1 829 m (6 000 ft)
Electrostatic discharge	15 kV or more
Acoustic noise	50 dBA at typical office ambient temperature: 18°C to 22°C (64.4°F to 72°F)

Environmental condition	Specification
Operating shock	No errors with a half sine wave shock of 2 G (with 1 millisecond duration)
Handling drop	The system is operational after a free fall from 45 cm to 60 cm (18 in. to 24 in.), depending on weight

1001rp and 1002rp server specifications

The “non-operating” term used in the table refers to the environmental conditions that have to be maintained during shipping, storage, or both

Parameter	Condition	Specification
Temperature	Operating	5°C to 35°C (41°F to 95°F)
	Non-operating	-40°C to 70°C (-40°F to 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 G, 10 ms (10 G, 11 ms in the appropriate chassis)
	Non-operating	30 G, 10 ms (40 G, 11 ms in the appropriate chassis)
Vibration	Operating	0.25 Gs at 5 Hz to 100 Hz (1.5 G over 5 Hz to 100 Hz in the appropriate chassis)
	Non-operating	5 G at 5 Hz to 100 Hz
Altitude	Operating	4 572 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 150
CCS values and channel requirements table 151

Types of traffic capacity tables

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 151.

	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 Succession 1000 Voice, 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 150.

	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

	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)**
10	213	184	183	157
11	242	213	210	183
12	271	242	238	210
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

	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)**
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
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

	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)**
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
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

	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)**
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
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

	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)**
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
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

	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)**
95	3070	3035	2995	2960
96	3105	3070	3030	2995

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Installation and Configuration Planning and Engineering Guide

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