

MITEL

NuPoint Messenger



Retrieve



Review



Respond



Feature
Guide



MITEL

Mitel NuPoint Messenger™ Software Release 7.0 – Feature Guide

TABLE OF CONTENTS

- Section 1: Introduction1**
- Section 2: The Mitel NuPoint Messenger™ Server2**
- Section 3: The User Interface4**
 - 3.1 We Speak Your Language4
 - 3.2 Messaging for the Hearing Impaired4
 - 3.3 Only the Highest Quality Will Do5
- Section 4: NP Flex – Mailbox Features and Capabilities6**
 - 4.1 Feature Classes of Service (FCOS)6
 - 4.2 Limits Class of Service (LCOS)7
 - 4.3 Group Class of Service (GCOS)7
 - 4.4 Network Class of Service (NCOS)7
 - 4.5 Restricted Class of Service (RCOS)7
 - 4.6 Tenant Class of Service (TCOS)8
- Section 5: Outside Caller Features9**
 - 5.1 Telephone Answering9
 - 5.2 NP Receptionist9
 - 5.3 NuPoint Agent™9
 - 5.4 NP OnDemand11
 - 5.5 NP CLI and NP Boomerang11
- Section 6: Mailbox Owner Features12**
 - 6.1 Notification12
 - 6.2 Review Messages13
 - 6.3 Recording and Sending Messages13
 - 6.4 Mailbox Customization15
 - 6.5 Advanced Subscriber Features16
- Section 7: Multi-Media Messaging with NP View18**
 - 7.1 Easier and Faster Messaging18
 - 7.2 NuPoint Fax™ and NP View18
 - 7.3 Saving Messages18
 - 7.4 NP View Remote18
 - 7.5 NP View 1.2 (Mitel NuPoint Messenger Software Release 6.1 and above)19
- Section 8: Application Mailboxes20**
 - 8.1 Greeting Only20
 - 8.2 Tree20
 - 8.3 Chain20
 - 8.4 Rotational20
 - 8.5 Broadcast20
 - 8.6 NP Forms21
 - 8.7 Shared Extension21
 - 8.8 Virtual Mailboxes21

8.9	Guaranteed Fax	21
8.10	Walkaway Fax	21
Section 9: NP Admin, NP Config and System Management		23
9.1	NP Admin and NP Config	23
9.2	Functionally Partitioned System Administration (FPSA)	25
9.3	Billing and Reporting	26
9.4	Administration by Telephone	26
9.5	System Backup and Restore	27
9.6	Message Purge	27
9.7	Telnet Access	27
Section 10: Security		28
10.1	Disaster Recovery	28
Section 11: Networking		29
11.1	Voice Profile for Internet Mail (VPIM)	29
11.2	NP Net	30
11.3	AMIS	31
Section 12: PBX Integrations		32
12.1	Methods for PBX Integration	32
12.2	In-Channel Integration	32
Section 13: Architecture		34
13.1	The MESA Design Strategy	34
13.2	Functional Overview	36
13.3	Shared Resource Fax	44
Appendix I: Class of Service Descriptions		46
Appendix II: Line Card Exceptions		57
Appendix III: Line Card Interfaces		61
Appendix IV: Integration Matrix		62

Section 1: Introduction

Mitel NuPoint Messenger™ from Mitel Corporation offers a multitude of unique, user-friendly voice and fax store-and-forward, call processing and multimedia messaging applications. These include NuPoint Voice™, NuPoint Fax™, NuPoint Agent™ and NP View respectively.

In addition, Mitel NuPoint Messenger offers a suite of enhanced services, which may be customized for individual operators worldwide using powerful NP Flex, a design tool from Mitel Corporation that allows an administrator to define the features and capabilities of a mailbox (See Section 4 for more information).

These services include NP Page, NP Cut Through Page, NP WakeUp, NuPoint Fax, NuPoint Agent, NP Boomerang and NP OnDemand. All of these applications are easily accessible from any touch-tone telephone using single-digit commands. The NuPoint Voice and NuPoint Fax applications also may be accessed through any PC using NP View. Some examples of Mitel NuPoint Messenger applications include:

- Paging a mailbox owner when a new voice or fax mail message arrives
- Allowing callers to not only leave a voice mail message, but input their call back number which is then displayed on the mailbox owners pager.
- Scheduling automatic wake-up calls to any telephone at any date and time
- Using the telephone to download a fax message to any fax machine at any time now or in the future
- Recording a voice and/or fax message and having it automatically distributed to thousands of people
- Delivering new, unplayed voice or fax messages to an on or off-system telephone number of choice
- Faxing a Windows document from a PC with voice annotation to multiple destinations, without using the PC fax modem
- Routing callers to predetermined destinations based on time of day, day of week, or day of year
- Listening to a message, then pressing two keys to talk “live” to the message sender without having to exit your mailbox
- Allowing callers to record messages and have them delivered to users without mailboxes

Mitel NuPoint Messenger products are simple in design and operation. The software architecture has been kept simple, so customization and upgrading are not unnecessarily complex or expensive for the user. All of these applications reside on the Mitel NuPoint Messenger server.

Four different Mitel NuPoint Messenger models are available to provide communication solutions for organizations worldwide:

- Model 70—serves smaller installations with up to 32 ports and 210 hours of redundant speech storage
- Model 120R—serves mid size installations with up to 48 ports and 210 hours of redundant speech storage
- Model 120S—serves large size installations with up to 60 ports and 960 hours of redundant speech storage
- Model 640—provides up to 240 ports with 2880 hours of redundant speech storage/5760 hours non-redundant speech storage

Section 2: Mitel NuPoint Messenger

Because all application products from Mitel Corporation are supported on the Mitel NuPoint Messenger server they can be integrated to provide advanced features and functions. Moreover, all of these features and functions are accessible from the most ubiquitous, userfriendly terminal: the touchtone telephone. Mitel Corporation

also offers complete desktop control of voice and fax messages from a windows-based PC.

Exhibit 2-1 is a matrix of some of the possible communications solutions enabled by the Mitel NuPoint Messenger server. Exhibit 2-2 details the four application products that provide the underlying capabilities for developing these solutions.

EXHIBIT 2-1: COMMUNICATIONS SOLUTIONS			
	Voice	Image	Data
Messaging	Voice Mail	Fax Mail	N/A
Information	Audiotext/NuPoint Agent	Fax Publishing	N/A
Transaction	Voice Forms	Fax Transaction	
Call Processing	NP Receptionist/NuPoint Agent/ NP OnDemand	Guaranteed Fax	NA
Notification/ Delivery	Telephone MWI/NP Paging/ off-system Messaging	Fax Broadcast/ Fax MWI	NP Cut Through Paging / NP View MWI

EXHIBIT 2-2: PRODUCT CAPABILITIES	
NuPoint Voice™	The heart of the Mitel NuPoint Messenger server, NuPoint Voice is a feature-rich voice messaging product that brings new levels of efficiency and effectiveness to an organization's communications. Using the Mitel NuPoint Messenger server's TUI, GUI and automated processing capabilities, NuPoint Voice increases productivity, letting employees dedicate their time to tasks that deserve personal attention. This, in turn, increases job satisfaction and allows organizations to allocate human resources cost effectively. NuPoint Voice improves customer service by giving callers easy access to the people and information they need within your enterprise. Now callers can leave detailed messages or listen to recorded information 24 hours a day.
NuPoint Fax™	Provides complete facsimile management, letting users send and receive fax messages from their personal "mailbox," just as they do voice messages. Because the NuPoint Fax application is fully integrated with NuPoint Voice, one phone call gives users access to both fax and voice messages. NuPoint Fax supports key applications, such as fax broadcasting for quick and cost-effective information dissemination and fax publishing for providing customers with 24-hour access to information without traditional publishing costs.

NuPoint Agent	<p>Combines powerful call processing and flexible automated attendant capabilities to meet all of your organization's call-processing needs. Fully integrated with NuPoint Voice, the NuPoint Agent application answers calls, plays messages and routes callers—all without human intervention's. The advanced features of the NuPoint Agent application and its modular design allow you to tailor call-processing applications to meet the specific needs of satellite groups, departments or individuals. This flexibility results in improved customer contact, more efficient allocation of operator time, and increased productivity and efficiency for all employees—especially mobile personnel.</p>
NP View	<p>This Windows-based GUI integrates voice and fax mail on the PC desktop, letting users communicate faster and more effectively. The NP View inbox window collects all voice and fax messages in one place and lets the user see at a glance the type of message, the sender's name, the subject of the message, the time it was sent, and any level of urgency. Employee productivity increases dramatically as users prioritize messages to respond to the most important ones first, and as they manage messages remotely, using a PC or laptop with a modem. Now users can listen to voice mail through the PC sound system, and they can view, send and print fax messages—all from the PC.</p>

Section 3: The User Interface¹

Human factors always have been a paramount consideration in the engineering of the NuPoint Voice and NuPoint Fax application user interface. Mitel Corporation was the first company to offer mnemonic prompts, an online user tutorial, single-digit prompts, and system administration from a telephone.

Mnemonic prompts provide easy to remember commands for each step of the call process. In addition, all commands are single digits, and menus are structured to present the most frequently chosen options first. The learning process for new users is accelerated, since it quickly becomes second nature to press “P” to play or “A” to answer a message, for example. Outside callers also can remember multiple menu items better, because key strokes have a direct association with the corresponding operations. Once the user is comfortable with the prompts, they may override them.

Coupled with a friendly user interface is a mailbox tutorial for every new mailbox on the system. The user is guided through this tutorial the first time they log into their mailbox. During the tutorial, the user learns about all messaging capabilities and customization features available in their mailbox. In addition, the user is led through the process of recording their name, a personal greeting, and a secret passcode. After the initial tutorial is completed, a user can access the tutorial again at any time through the “User Options” menu in their mailbox. If a user does not wish to hear the tutorial the first time they log into their mailbox, the system administrator may disable it.

Since Mitel NuPoint Messenger commands are easy to remember, users take advantage of advanced features. Corporate employees who begin by using the system just to take messages discover that, simply by pressing the “A” key, they can answer messages from other employees, and even hold “virtual conferences” through voice messages. System administrators find they can migrate their customers to increasingly sophisticated levels of service as the customers discover how simple even the advanced features of Mitel NuPoint Messenger are to use.

The Mitel NuPoint Messenger prompts are context sensitive. After listening to a message, the user

can press “A” to Answer it; after recording a message, the user can press “A” to Append to it. During a message playback, a user can press “T” to go to the Top of the next message; after hearing a fax message has arrived, a user can press “T” for fax Transmittal options. The experienced user can override prompts with Dual Tone Multi-Frequency (DTMF) tones (key presses), and even enter an entire string of commands at one time. Mitel NuPoint Messenger retains and executes these commands in the order in which they are entered. Help is always available; The user simply waits for the prompt menu to be replayed. If the user presses an incorrect key, the system issues an informative error message, such as “I’m sorry; I did not understand that command,” followed by prompts for the options available at that time.

3.1 WE SPEAK YOUR LANGUAGE

In addition to English mnemonic prompts, standard numeric prompts are available on Mitel NuPoint Messenger in English, Australian English, British English, New Zealand English, Canadian French, Cantonese, German, Latin American Spanish, Japanese, Korean, Mandarin, Mexican Spanish and Brazilian Portuguese. Mitel Corporation also offers custom languages as an option. Each Mitel NuPoint Messenger server can offer from four to twelve full language sets. Line group assigns prompt languages, which is particularly useful in international applications. Customers who speak French can be given the pilot number for a line group where French prompts are played, and Spanish speaking customers can be given a number on the same system that issues Spanish prompts. Prompt languages also may be assigned to individual mailboxes, through the mailbox’s class of service configuration.

3.2 MESSAGING FOR THE HEARING IMPAIRED

This optional language allows TDD callers access to the messaging features of NuPoint Voice and NuPoint Fax applications, and meets the requirements set forth in Title IV of the Americans with Disabilities Act (ADA). Spoken prompts are converted to Baudot tones (the tones TDDs use to send and receive) and

¹ See Section 7, “Multimedia Messaging with NP View” for an explanation of the desktop user interface.



displayed on the TDD user's screen. By entering numeric commands through their telephone keypads (e.g., "press 2 to answer"), TDD users can play, make, keep, delete, answer, and give messages. TDD users also have access to more advanced messaging features, including audiotext applications, broadcast mailboxes and distribution lists, compound messages that annotate fax messages with voice messages, and notification through message-waiting lights.

3.3 ONLY THE HIGHEST QUALITY WILL DO

Mitel NuPoint Messenger supports high quality prompts, names and greetings. Prompts are available in 24 kbps. Names, greetings, and messages are available in 18.3 kbps, 24 kbps and 32 kbps. Speech and prompt quality can be configured system wide, on a line group level, or on an individual mailbox level.

32 kbps greetings can be used to provide high quality company information (audiotext) mailboxes, or bulletin boards. 24 kbps prompts are used to enhance the quality of the user interface.

Section 4: NP Flex – Mailbox Features and Capabilities

Mitel Corporation has substantial experience selling into Customer Provided Equipment (CPE) markets. Serving these markets has given Mitel Corporation a unique insight into the messaging needs of a broad base of user communities, and the different features and capabilities required for their particular business applications. Mitel NuPoint Messenger satisfies these diverse needs through NP Flex, a design tool that allows an administrator to define the features and capabilities of a mailbox.

NP Flex allows a system administrator to enable voice and fax mailboxes with a unique set of features, capabilities, and parameters. There are over 300 capabilities that can be assigned by NP Flex and these may be configured into over 107 million distinct classes of service on a single system. Classes of service and individual features may be changed effortlessly and as often as desired on an individual mailbox level. In addition, these changes can be made online while the system is processing calls.

NP Flex provides this design flexibility through six distinct classes of service categories, which can be programmed and assigned independently of one another. These are the Feature Class of Service (FCOS), Limits Class of Service (LCOS), Group Class of Service (GCOS), Network Class of Service (NCOS), Restricted Class of Service (RCOS) and Tenant Class of Service (TCOS).

4.1 FEATURE CLASSES OF SERVICE (FCOS)

When callers contact the Indianapolis Convention and Visitor's Association they hear a welcoming greeting and are presented with four choices. "Press 1 on a touch-tone phone" to record their address for a visitor's guide mailing. "Press 2 to hear information on attractions and events"; "press 3 to hear descriptions of local hotels" and, if desired, to transfer to the hotel of their choice to make a reservation; or "press 4 to speak to a representative of the association." Callers on rotary phones are automatically transferred to a representative.

All these options can be implemented on any Mitel NuPoint Messenger server. The Indianapolis Convention and Visitor's Association simply took advantage of the powerful Feature Class of Service (FCOS)

capabilities that are part of every system. Every mailbox on the system has a unique set of features that are enabled by feature bits. Based on Software Release 7.0, Mitel NuPoint Messenger has over 250 different feature bits. These features range from basic user privileges such as the ability to receive messages from outside callers, to specialized operations like fax broadcasting. Combining feature bits creates an FCOS, which defines the capabilities of an individual mailbox.

A rich FCOS structure from Mitel Corporation means that our customers can create many specialized applications without purchasing new software or hardware. The system does not force you to use a set of preprogrammed choices. Default FCOS are included in the system configuration to allow the system administrator to create mailboxes immediately after the system is installed, but these FCOS definitions can be modified by adding or deleting feature bits. An example is the Greeting Only FCOS, which plays a greeting to an outside caller (such as movie listings, weather information, or store hours), then, hangs up.

Each mailbox on the system can have a unique set of features and capabilities. Fax capabilities (fax broadcasting, fax on demand, fax store and forward, guaranteed fax, walkaway fax) and special mailboxes (tree, broadcast, check-in/check-out) are examples of features enabled by feature bits. Every mailbox can be customized with a unique FCOS, which can be changed easily and as often as necessary by the system administrator. If a user's mailbox is assigned to an FCOS that excludes a specific feature, the user will not hear any prompts that refer to that feature.

FCOS is used in one of three distinct ways. First, it is often valuable to differentiate a novice user from an experienced user and to provide advanced mailbox features for experienced users only. This minimizes training and support requirements associated with system implementation. Second, FCOS is often used to match a mailbox to the requirements of a specific application. Examples include rotational mailboxes for audiotext, check-in/check-out mailboxes for lodging and hands-free mailboxes for cellular phone users. Third, administrators build several distinct tiers of messaging service use FCOS.

Each tier has a richer functionality. Up to 640 FCOS can be programmed to define unique mailbox functionality. Please see Appendix I for a list of feature bit by category.

4.2 LIMITS CLASS OF SERVICE (LCOS)

LCOS defines all of the operating parameters of a mailbox by restricting message, greeting, and outdialing digit lengths. These parameters allow the system administrator to control the use of the system resources. They are frequently used in conjunction with FCOS to build multiple tiers of service offerings. Like FCOS, they can be configured and changed online by the system administrator.

Language prompts (English, Australian English, British English, New Zealand English, Canadian French, Cantonese, German, Latin American Spanish, Japanese, Korean, Mandarin, Mexican Spanish and Brazilian Portuguese) are set in the Limits Class of Service.

Up to 640 LCOS can be programmed to quantify different categories of parameters. A list of these parameters is included in Appendix I.

4.3 GROUP CLASS OF SERVICE (GCOS)

The GCOS defines mailboxes with which a user can exchange messages. GCOS provides software partitioning at the mailbox level, without requiring partitioning at the line group level. This class of service category allows the NuPoint Voice and NuPoint Fax applications to be configured as either closed or flexible communities of interest, all served by the same multiline hunt group (MLHG).

There are two types of GCOS assignments: bit-mapped, flexible GCOS that can accommodate multiple member groups within a GCOS, and simple GCOS groups, that only one level of affinity communication.

Sixty-four flexible, bit-mapped GCOS can be programmed. A mailbox can be assigned to one, some, or all of these GCOS. That mailbox can then exchange messages with any other mailbox that is a member of any common GCOS. As an example, a hierarchy of messaging can be built so that the president of a company can

communicate with any of the senior staff. Staff can communicate with the president, with each other, or within the department. But lower level department members can only talk to their senior staff representative, not with the president and not across departmental lines.

Up to 32,000 GCOS can be built as simple affinity groups. Mailboxes assigned to these GCOS can only communicate with each other and do not enjoy the hierarchy that was described above. Affinity groups allow the system to be partitioned into “virtual” systems, so that many different user communities or organizations can share a single system. With GCOS, this can be done confidentially and transparently to the distinct user groups.

4.4 NETWORK CLASS OF SERVICE (NCOS)

NCOS works in conjunction with NP Net digital networking products from Mitel Corporation and allows the system administrator to regulate user access to and priority on the digital network. A mailbox's NCOS control communications between users in one location with users on a Mitel NuPoint Messenger server in another location. A list of NCOS parameters can be found in Appendix I.

4.5 RESTRICTED CLASS OF SERVICE (RCOS)

The RCOS is used to provide NPA/NXX screening, which in turn allows a system administrator to screen all outgoing NuPoint Voice and NuPoint Fax application calls (e.g., fax retrieval, NP WakeUp, message delivery, paging). NPA/NXX screening takes place at both the toll (central office) level and the area code (long distance) level. And, because system administrators can configure a different RCOS for every mailbox owner on the system, each mailbox can have a different screening configuration. NPA/NXX screening can take place in two different ways:

- Allow users to outcall to any number except those specified in the RCOS
- Allow users only to outcall to those numbers specified in the RCOS

A mailbox owner can be allowed to download faxes to all numbers in the 415, 408 and 510 area codes only, or to all area codes except 515.



Alternatively, NPA/NXX can provide additional security enhancements to the Mitel NuPoint Messenger server by protecting it against toll abuse. Using RCOS, any specified mailboxes can be prohibited from making 976 or 900 calls. In addition, more flexibility can be given to traveling employees to send messages, faxes, and pages to long distance numbers, versus local employees, who only may need to deliver faxes to an internal extension. With NPA/NXX, system administrators have complete flexibility in designing the appropriate limitations on an individual mailbox basis.

4.6 TENANT CLASS OF SERVICE (TCOS)

The TCOS applies only to systems using the Unified Integration capability, which supports up to 24 different switches and up to 56 different tenant groups to share the same Mitel NuPoint Messenger server. The TCOS controls what outside callers hear and how they are routed within and across the multiple line groups of a shared tenant application.

Section 5: Outside Caller Features

There are five types of outside caller features: Telephone Answering, Automated Receptionist, NuPoint Agent, NP OnDemand, and Calling Line Identification (CLI) Capture.

5.1 TELEPHONE ANSWERING

An example of telephone answering is when a caller reaches an extension and is transferred to the NuPoint Voice application to record a message. After recording their message, outside callers can be given the opportunity to:

- Replay their message
- Re-record their message
- Mark their message “urgent” so it is placed at the top of the mailbox owner’s message queue
- Have the mailbox owner paged and enter a call-back number to be displayed on the pager
- Leave a message for another mailbox on the system
- Be transferred to the operator or any extension on the switch
- Leave a callback number for faster call return

5.2 NP RECEPTIONIST

NP Receptionist is an optional feature that answers incoming phone calls and asks the caller to enter the extension number of the party they wish to reach. If they do not know the extension number of the party, they can spell out the name on the telephone keypad. Once the extension has been entered, the system will transfer the caller to the desired party’s extension.

Calls may be transferred blind, supervised, or screened. If it is a blind transfer, the system hangs up once the extension is dialed. If it is a supervised transfer, the system stays on line until the caller gets through to the desired extension. If the extension is busy or ring on answer, the call is pulled back and the caller can choose to leave a message in the called party’s mailbox, or be transferred to another extension. A screened transfer is when the called party is fore-warned who is calling and can choose to accept or reject the call. Again, if the called party chooses not to answer the call, the caller may leave a message in the called party’s mailbox or be transferred to another extension. The system

administrator configures the options available to a caller (transferring to another extension or leaving messages in mailboxes).

5.3 NUPOINT AGENT

The NuPoint Agent application provides advanced call processing capability for Mitel NuPoint Messenger. NuPoint Agent is designed for flexibility and allows you to:

- Design complex call processing applications
- Build powerful automated attendants for your company
- Create customized audiotext and information delivery applications
- Utilize multiple call processing applications on each line group
- Configure every extension with its own unique call processing options
- Create customized department call processing applications
- Program or change your call processing applications at any time using a touch-tone telephone

NuPoint Agent is a powerful tool designed to allow users to build customized call processing applications. In most instances, every department or individual in a company does not require their own call box. Call boxes are primarily used on an exception basis for those individuals or departments who require special call processing. Users have a number of features to select from to build in their specific applications. The key building block for all applications is the call box, which is described in the next Section.

The Call Box

The flexibility of the NuPoint Agent application stems from its modular architecture, which uses combinations of call boxes to build call-processing applications. Just as a voice mailbox handles all the voice and fax messaging for the Mitel

Corporation platform, a call box handles all the call processing. A call box allows users to select any or all of the features needed for a specific call processing application. Call processing applications can be created using one or more call boxes.



Overview

The functionality provided by the call box is divided into the following six segments:

Override

If enabled, the override segment will supersede the remainder of the call box and take a predefined action such as transferring to an extension or another call box.

Holiday Schedule

Routes callers depending on the day of the year. The user can set up holiday call processing up to one year in advance. Each year the holiday schedule is automatically updated by the NuPoint Agent application, based on the holidays selected the previous year.

Weekly Schedule

Routes callers depending on the time of day and day of week.

Greeting

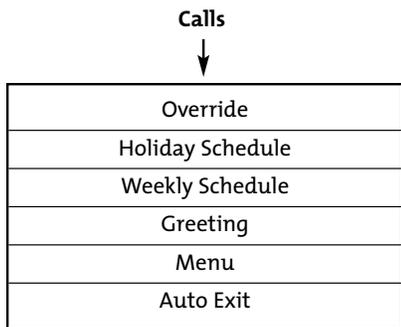
Plays a user-recorded greeting.

Menu

Plays a user-recorded menu at user-definable number of times. This segment will also route callers depending on their single-key or multikey DTMF inputs.

Auto Exit

If no other segment has routed the caller, auto exit will route the caller based on a predefined action.



The picture above graphically represents a call box. Every call is processed sequentially through each call box segment, beginning with the first segment override. If callers are not routed or

transferred out of the call box by the override segment, they are passed on to the next segment schedule. Callers move through the call box until they are processed appropriately. A screen example of the main call box configuration screen showing each of the call box segments is included in the Administration section of the NuPoint Agent Product Note.

Call Box Actions

Call box actions are the transfer and routing functions available within each call box segment. Depending on the call box segment, certain actions are possible and some are not possible. The NuPoint Agent application can automatically route callers to call boxes, extensions and mailboxes, or take touch-tone input from the caller and route them to the specified selection. The primary actions available are depicted in the following picture of an "action box" taken from an actual NuPoint Agent screen.

CBX	Call box
SUP	Supervised Transfer
BLND	Blind Transfer
ALT	Alternate Transfer
SCRN	Screened Transfer
ATND	Attendant
DISC	Disconnect
MBX	Mailbox
UND	Undefined
CONT	Continue in Call box
DBN	Dial-by-Name

The NuPoint Agent application supports the 18.3, 24 and 32 kbps speech compression rates available in Mitel NuPoint Messenger. Users can set the compression rate for each individual call box to improve speech quality. Transfers from the Menu and Auto Exit segments to a NuPoint Voice mailbox can now be set to skip the mailbox greeting. NuPoint Agent Release also allows administrators to program 10 digit telephone digits through the telephone interface, allowing users to transfer calls to different area codes. Finally, with Mitel NuPoint Messenger, NuPoint Agent billing information is provided through the Enhanced NP Call Detail Recording (NP CDR) option.

5.4 NP ONDEMAND

NP OnDemand is a feature that allows an outside caller to record a voice message for a user who does not have a mailbox, and have that message delivered to the user. The outside caller benefits by having the opportunity to communicate non-real time with a user whom they otherwise would not be able to reach.

For example, mailboxes could be created dynamically for students who do not have voice mail, in order to guarantee that outside callers, professors and other students can effectively communicate with students who are often difficult to reach.

5.5 NP CLI AND NP BOOMERANG

NP CLI enables Mitel NuPoint Messenger to capture the CLI number on an incoming call and store it with a voice/fax message. The primary use of the CLI is to provide a callback number for applications such as NP Boomerang.

NP Boomerang allows a mailbox user to suspend mailbox processing while listening to a message and establish a call with the caller at either the number input by the caller with the recorded message or a new number input by the user. In the situation where the CLI cannot be captured automatically for an outside caller, that caller will be prompted to keypad enter the callback number. Calling line identification for the outside caller interface can be enabled per mailbox in an FCOS basis.

Section 6: Mailbox Owner Features

6.1 NOTIFICATION

Overview

Mitel NuPoint Messenger supplies two message-waiting applications that can be used when an integration itself does not handle message-waiting indicators. The two applications are DTMF-to-PBX Message Lights and RS-232. These applications allow the server to turn PBX message waiting on and off. DTMF-to-PBX sends DTMF signals over the telephone lines; RS-232 sends signals to the PBX over an RS-232 data link or modem between the server and the PBX.

Expanded Modem Message Wait (Programmable RS-232)

This application allows Mitel NuPoint Messenger to turn PBX message waiting indicators on and off by sending signals to the PBX over an RS-232 data link. When a message is left in a mailbox, the server sends a one-way ASCII message that tells the PBX to turn on the message-waiting indicator at the appropriate station. Conversely, when all unplayed messages are played, the server sends an ASCII string that directs the PBX to turn off the message-waiting indicator.

To increase message waiting throughput and provide for added reliability Expanded Modem Message Waiting (EMMW) is available in Mitel NuPoint Messenger software release 6.1B or 7.0 and above. This feature has been enhanced to support up to 32 serial ports.

DTMF-to-PBX

This application allows the Mitel NuPoint Messenger server to turn PBX message waiting indicators on and off by sending DTMF signals over the telephone lines. Some PBXs allow telephone users to turn message waiting indicators on and off by dialing in a code. If your PBX has this capability, and if the code is not sent using proprietary signaling, you may be able to configure the Mitel NuPoint Messenger server to behave as if it were a station user.

When a message is left in a mailbox to which this type of message waiting has been assigned, the server goes off-hook, dials a string of DTMF

digits, and then goes on-hook. The PBX translates these digits, and turns the appropriate indicator on. When all unplayed messages have been played, the Mitel NuPoint Messenger server follows the same procedure (dialing a different string of digits) to turn the indicator off. You need to set up a line group of at least one line, which is dedicated to outdialing DTMF-to-PBX message waiting ports.

DTMF-to-PBX (EDTP) is enhanced in Mitel NuPoint Messenger software release 6.1B and above to allow for multiple ports to activate/deactivate message waiting while ensuring that the same port that activates message waiting is the same port that deactivates it.

The enhancement is designed to allow for multiple DTMF ports to address message waiting in the instance that the PBX requires that the port that activates message wait is the port that deactivates it. Therefore, the Mitel NuPoint Messenger port assigned to the DTMF-to-PBX application that activates message waiting will always be the port that deactivates. This is only required under the circumstance that the PBX dictates this requirement.

Message waiting lights or stutter dial tones usually are sufficient to notify a user that they have new messages, if the user is located next to their telephone. However, there are more and more individuals who do not regularly work at a specific office location or desk. For these people, a message waiting light is not very useful. In response to this situation, Mitel Corporation has created numerous ways in which a user can be notified of a new message. These include paging, cut-through paging and message delivery options.

Paging notification allows for real-time notification of voice and fax messages. The Mitel NuPoint Messenger server supports all commercially available pagers. If the pager is a voice pager, the system will deliver the first 30 seconds of the voice message. It can also send customized alphanumeric messages to paging users. The system supports integration to the widest variety of paging systems via dialup, and telocator network paging protocol (NP TNPP).

The system allows for paging customization. First, the mailbox owner can designate up to two primary and two alternative pager numbers. Second,

the mailbox can be configured to page at certain intervals or frequencies, or for urgent messages only.

NP Cut Through paging allows an outside caller or a mailbox user to send a callback number to a digital pager. Normally when an outside caller leaves a message, only the user's mailbox number is sent to the digital display pager. With NP Cut Through paging, a user can circumvent their mailbox and contact the caller directly, using the callback number input by the caller. The caller also has the option of leaving a voice or fax message in the user's mailbox and leaving a callback number.

Message Delivery is another convenient and timely way to deliver new messages to mailbox owners who work offsite or who are working away from their telephone. If a user decides to work out of their home, they can bypass the need to call into voice mail every hour by using message delivery. The system will call the user at home (or wherever the user preconfigured the system to call) every time a new message arrives. When the phone is answered, the system will prompt, "Hello <user's name>. You have <number> unplayed messages in your mailbox. Please enter your passcode." Once entered, the system prompts the user with the main menu (e.g. "press P to Play your first message, M to Make a new message" etc.)

Like other notification features, message delivery allows the user to set the telephone number, specify the hours available for message delivery, and, through the system administrator, to specify the types of messages to deliver (urgent only, for example).

6.2 REVIEW MESSAGES

After being notified of new messages, a user calls into the system, logs into their mailbox, and hears how many new and saved messages they have. The user can then choose to listen to all, some or none of the messages (urgent messages first, unplayed messages second, and saved messages third), listen to a message multiple times, move forward/backward within the message, pause, or skip to the next or previous message in queue. Once played, any message can be kept or deleted. All messages contain a time and date

stamp and the sender's name (if the message is from a mailbox owner and they have recorded their name). Messages from outside callers contain the phone number of the caller (if captured by CLI or input by the caller).

After listening to a message, the user can answer the message automatically without having to hang up or dial another extension. The original message can be attached to the reply to remind the message sender of the subject matter. If the user chooses, they also can give the original message to one or more recipients along with their own comments. All of these options can be configured at the mailbox level, giving the user the ability to customize their own mailbox.

6.3 RECORDING AND SENDING MESSAGES

In addition to receiving and playing messages, a mailbox owner can "make" a message and send it to one or more destinations from within their mailbox. Once a mailbox owner requests to make a message, they are asked to indicate the message destination. With Mitel NuPoint Messenger, users can send messages to the following destinations:

- Another mailbox on the system
- Another mailbox on the system utilizing an abbreviated mailbox number
- A mailbox on a networked system
- Another mailbox over the internet to Voice Processing over the Internet (VPIM) enabled voice messaging servers within and out of the Mitel Corporation family product line
- An off-system telephone number
- A network user without a mailbox
- A mailbox on another vendor's voice mail system
- A distribution list containing any of the above
- A broadcast mailbox containing any of the above
- Any combination of these

NP Rapid Dial

The NP RapidDial optional feature provides mailboxes in a User Group with the ability to dial other mailboxes within that group with an

abbreviated version of the mailbox telephone number. This abbreviated mailbox number can be used only for mailboxes within the User Group. When dialing numbers outside of the User Group, the full Mailbox number is required.

The NP RapidDial optional feature requires that User Groups are defined and that the Mailbox numbers supported in that group are defined in a NP RapidDial Table. The NP RapidDial Table maps the abbreviated Mailbox numbers to their fully qualified numbers, thus enabling the system to receive the abbreviated number and translate that number into an expanded version of the Mailbox number. The NP RapidDial Table defines the prefix field of the phone number and the suffix range of mailbox numbers that are to be used for NP RapidDial. The prefix and the suffix must be 11 digits or less and the prefix can contain a maximum of 9 digits. The suffix is used as the NP RapidDial number for all prefixes in the NP RapidDial Table.

Call Placement allows mailbox owners to send messages to off-system (e.g., nonuser) telephone or fax numbers. When the message is sent to an off-system telephone number, Mitel NuPoint Messenger immediately outdials the off-system telephone number and attempts to deliver the message. If Mitel NuPoint Messenger cannot deliver a message on the first attempt, the system will try again at regular intervals for a specified length of time. The system administrator can adjust both the retry interval and time length. When the call is answered, Mitel NuPoint Messenger tells the answering party who the call is for and whom it is from. The recipient may accept, reject, or delay the call. After listening to the message, Mitel NuPoint Messenger allows the recipient to leave a message for the message originator. In any case, the Mitel NuPoint Messenger will notify the caller if the message could not be delivered. If the message is an off-system fax, NuPoint Fax will not play the abovementioned prompts.

Mailbox owners can make messages for users who do not have a mailbox on Mitel NuPoint Messenger through the NP OnDemand feature. NP OnDemand mailboxes can be created by mailbox owners through the "make" function just by entering the user's telephone number and recording a message.

In the case of delivering messages to mailboxes on other vendors' systems, the Mitel NuPoint Messenger server sends the message via Voice Profile for Internet Mail (VPIM). VPIM is an industry standard established by the Electronic Media Association (EMA) for connecting dissimilar voice messaging systems for the efficient and cost-effective exchange of voice and fax messages across TCP/IP-based secure intranets and the Internet. In Release 7.0, Mitel NuPoint Messenger has unleashed the built-in VPIM capability opening new doors to global communications at a fraction of the cost.

In the case where the dissimilar server is not VPIM enabled, the message can be sent via Audio Messaging Interchange Specification (AMIS). AMIS follows the Audio Messaging Interchange Specification (AMIS) standard. With AMIS, when a mailbox on the other vendor's system receives the call to deliver the message from the originating system, Mitel NuPoint Messenger will deposit the message in the mailbox without requiring the recipient to accept the call.

Mailbox owners can send voice and/or fax messages to multiple destinations using distribution lists. Mailbox owners may use both personal and system distribution lists to send messages. Up to 99 personal distribution lists may reside in a mailbox owner's mailbox, and each can contain 65,535 members. Up to 99 system distribution lists with 65,535 members each can reside in an administrator's mailbox (one administrator mailbox per linegroup), and can be accessed by mailbox owners who dial into that linegroup. Distribution lists also may be nested, so that one or more personal distribution lists can be members of other personal distribution lists.

Broadcast mailboxes can be made available to both mailbox owners and non-mailbox owners to send messages to multiple recipients at one time. Broadcast mailboxes use personal distribution lists to accomplish this.

When a user has finished recording a message, they can review it, delete it and re-record, or send it. Mitel NuPoint Messenger allows a user to send messages with a number of delivery options. An example would be an urgent message that would be placed at the front of the recipient's message queue. The following are examples of message addressing delivery options on Mitel NuPoint Messenger:

- Marking a message urgent
- Marking it confidential (so that it cannot be given to another user)
- Setting it for future delivery
- Requesting a return receipt (to see if the recipient listened to the message)
- Any combination of the above

6.4 MAILBOX CUSTOMIZATION

Although the system administrator is responsible for creating and modifying mailboxes, Mitel NuPoint Messenger allows users to personalize their mailboxes with the following features:

- Recording a name
- Recording primary and conditional greetings
- Setting the passcode
- Creating personal distribution lists
- Setting a default fax delivery number
- Enabling/disabling automatic fax delivery
- Retrieving all unplayed faxes at once
- Activating the tutorial
- Scheduling message delivery
- Changing a message delivery number
- Scheduling paging
- Changing a pager number
- Activating/scheduling auto wakeup

A mailbox user's name recording is used in several places on the system. For example, when an inside caller reaches a user's mailbox, they first hear the name recording, verifying that they have reached the correct mailbox extension. In addition, when a user logs into their mailbox to retrieve their messages, they first hear their name recording. Finally, when a user retrieves a message, they hear the name recording, identifying the person who left the message.

Users have the option of recording four multiple personal greetings: one primary personal greeting and three conditional personal greetings. The three conditions are *ring no answer*, *busy* and *all calls forward*. When a caller reaches an extension that is not answered, the caller hears the no answer greeting. If the called extension is busy, the caller hears the busy greeting, stating that the called party is on another line. When the called extension is forwarded to Mitel

NuPoint Messenger, the caller hears the forwarded greeting, notifying the caller that they have reached the called party's voice mailbox.

Passcode lengths can be 4-10 digits in length, and can be changed as often as a user wishes through the "User Options" menu. For more information on passcodes, see Section 10 on Security.

Personal distribution lists are used to send messages to a number of mailboxes at one time. Distribution lists can be changed by the mailbox owner as often as is desired through the "User Options" menu. Distribution lists are virtually limitless: each mailbox can have up to 99 distribution lists, and each list can have up to 65,535 members.

Setting a default fax delivery number precludes the need to enter a fax machine number to receive a fax. Instead, only one keystroke is necessary to download a fax from a user's mailbox.

If a user enables automatic fax delivery, all fax messages sent to their mailbox automatically are delivered to their default fax number. These messages also are stored in the user's saved queue. If the user is going on vacation and prefers not to have his/her fax messages downloaded for a period of time, this option easily can be changed through the User Options menu.

Retrieve all un-played faxes allows a mailbox owner to download multiple fax messages by pressing a single key in the user options menu. All un-played faxes in the user's mailbox at that time are concatenated and sent to the user's default fax number.

A mailbox owner can choose to listen to the tutorial at any time by choosing the "activate tutorial" option in the User Options menu.

A user can schedule the message delivery option to any telephone, using single-digit commands. Message deliveries can be programmed to occur at any time or date, and can be easily changed. For example, if a mailbox owner is working at a different location for a day, they can program the system to deliver all of their new or urgent messages to that specified number, eliminating the need to constantly check their mailbox for new voice or fax messages.

Users can also choose a paging schedule and a pager number to be notified of all or urgent messages only.

6.5 ADVANCED SUBSCRIBER FEATURES

NP WakeUp

A user can schedule a wakeup call from Mitel NuPoint Messenger any time, any day and anywhere. If the first call doesn't wake you up, you can program wakeup calls to occur multiple times at specified intervals, until you answer the phone. Users can schedule a wakeup call to occur every day on a long-term basis.

NP OnDemand

NP OnDemand allows administrators the opportunity to provide telephone answering and messaging capability for their users who do not own mailboxes. It can be used in multiple ways, such as:

- Allowing outside callers to record messages for users who don't own mailboxes.
- Allowing users with mailboxes to leave messages for users who don't own mailboxes.
- Notifying users without mailboxes of new "NP OnDemand" messages they have received through stutter dial tone, message waiting lights, or message delivery.

This is accomplished by having the system administrator create a template NP OnDemand mailbox (the template with the appropriate classes of service is predefined on the Mitel NuPoint Messenger server but can be modified) for one or more line groups. Once the template is created, outside callers or mailbox owners can record messages for network users who do not own mailboxes just by calling them. A temporary mailbox is automatically created for the user, and the user is notified of the new message.

Notification can occur in one or more ways, as defined in the template mailbox. It can be through message delivery, in which case Mitel NuPoint Messenger outdials to the user to deliver to them the actual recorded message left by the caller. It can occur through message waiting lights, stutter dial tone, or other message wait notification options available on Mitel NuPoint Messenger.

The user then logs into the NP OnDemand and listens to the unplayed message(s). At midnight the mailbox is purged, unless there are unplayed messages that are less than two hours old.

A new NP OnDemand can be created when another caller dials the user and is unable to reach them. Both of these options are configurable by the system administrator in the template mailbox.

NP OnDemand activity is tracked in Mitel's Call Detail Recorder (NP CDR) billing package. There are 26 fields, which record details of NP OnDemand activity. Information available for usage and/or billing includes:

- Creation of NP OnDemand—including date and time
- Purge of NP OnDemand—including date and time
- Number of unplayed, urgent, and fax messages in a NP OnDemand
- Number of messages played, kept or discarded in a NP OnDemand
- Number of minutes a user was logged into a NP OnDemand

NP Command Line Interpreter and NP Boomerang

NP CLI enables the Mitel NuPoint Messenger server to capture the CLI number on an incoming call and store it with a voice/fax message. The primary use of the CLI is to provide a callback number for applications such as NP Boomerang.

NP Boomerang allows a mailbox user to suspend mailbox processing while listening to a message and establish a call with the caller at either the number input by the caller with the recorded message or a new number input by the user. Once the call is complete, the user will be returned to the mailbox at the point immediately following the message, which was returned through the callback capability. When NP Boomerang is used in conjunction with the CLI Capture, the caller's number is automatically captured with the message and the caller does not need to input the return phone number.

NP Boomerang and CLI Capture together bring value by minimizing the number of keystrokes required to interact with voice messaging and to return messages left by callers. The features can also be a valuable productivity tool when used in the CPE environment.

CLI Capture is currently only supported with Enhanced Data Link, NEC (Mitel NuPoint Messenger Rel. 7.0) and Enhanced Inband

integrations. NP Boomerang will work with all integrations, however the outside caller must input their callback number.

Features

- Capturing the Caller's Number

The caller's number will be captured automatically with the message or it can be requested by the system for the caller to input.

- Two-key Message Return

Currently, with standard voicemail, the user is required to take a five-step process when attempting to return a caller's message. Memorize the caller's spoken phone number, exit from voicemail, place a new call by entering the key presses corresponding to the number of digits required to call the caller, hang up with the caller, and place a call back into voicemail. With NP Boomerang, the user has the power to

make an outgoing call to the caller's number by entering only two key presses.

- Changeable Return Number

The system will play back the CLI to the caller and the caller has the ability to delete or modify the number. If the CLI is invalid or not supplied by the caller's switch, the system gives the caller the option to input the callback number. The caller or user may modify the number that was input by the caller (or the CLI) and return the call in the same method as described in "Two-key Message Return". This feature is supported when the administrator enables the use of FCOS bit 264.

- User Return

When the call is completed, the system "Boomerangs" back to the menu at the point in voicemail at which the user chose to establish a call to the caller. This allows the user to discard the message, keep it or give it to another user on the system.

Section 7: Multimedia Messaging with NP View

NP View for Windows is a client software application that operates with the Mitel NuPoint Messenger server to provide voice and fax messaging on the desktop PC. NP View allows users to manage, create, and review their NuPoint Voice and NuPoint Fax application messages from a PC. With NP View, users have complete control over voice and fax messages and can:

- Integrate voice and fax messaging with their PC desktop
- View all their messages instantly
- Play, view, and create compound voice and fax messages
- Deliver faxes cost-effectively using the Mitel Corporation server
- Archive messages onto their local PC
- Keep in touch anywhere with remote modem access and message download capability
- Transfer contents of Mitel Corporation voice and fax messages to and from other Windows applications

7.1 EASIER AND FASTER MESSAGING

NP View uses a personal inbox to display all of a mailbox owner's voice and fax messages. At one glance a user can see each message in the mailbox, including information on the sender's name, the message-type (e.g., voice or fax), the subject line of the message, and the date and time of the message. Moreover, urgent messages are flagged with an exclamation point and confidential messages with a lock. From the inbox a user can double-click on a voice message, and NP View will automatically play the message either through a sound card on the user's PC or through any telephone.

In addition to playing voice messages and viewing faxes, NP View provides a number of easy point-and-click functions to help users manage their voice and fax messages. Users can Make, Give, and Answer messages directly from NP View. With a few simple commands users can record a voice message, address it another user, attach a fax, and send the compound message to the recipient.

To help the user address and send messages, NP View utilizes address books and distribution

lists. When addressing a message, the user can select a recipient from any of these address books or distribution lists. The distribution lists are the same system and personal distribution lists available to the user through the touch-tone telephone interface. NP View accesses two types of address books: a system address book and a personal address book. The system address book has the names and mailbox numbers of everyone with a mailbox on the local Mitel NuPoint Messenger server. The personal address book is where users keep a personalized list of names, phone numbers and fax numbers of colleagues, suppliers and customers.

7.2 NUPOINT FAX AND NP VIEW

In addition to viewing fax messages from their PC, NP View improves a user's ability to create and send of faxes. Users can create a fax message from any Windows application and send it to any mailbox on Mitel NuPoint Messenger or to any fax machine in the world. NP View eliminates the need for having a fax board in every PC and an analog Direct Inward Dialing (DID) phone line in every office. Users can share the server fax resources on the Mitel NuPoint Messenger server.

7.3 SAVING MESSAGES

NP View allows users to drag-and-drop messages from the inbox into message folders, where they are saved on the local hard drive or on a network file server. In addition, users can convert a voice message into a standard Windows .WAV file or convert a fax into a standard .TIF file (or into a file in any of the popular .BFX, .BMP, .DCX, and .PCX formats), use virtually any Windows application (e.g., MS Word, cc: Mail), and save it in a Windows folder. Once in these standard formats, users can embed these messages into the documents.

7.4 NP VIEW REMOTE

NP View Remote is a new product that allows users to access their messages from their PC using a telephone line and a modem. Remote users can call into the Mitel NuPoint Messenger server from any location and have full NP View

access to their mailbox. NP View provides two modes of operation for remote users, online and offline. In the online mode, users can directly access their mailbox functions, as they would from a local PC connected to the Mitel NuPoint Messenger server. In the offline mode, users can download the contents of their messages to their local PC and then log off. Their mailbox information is now stored on the local PC and they can manage their messages (e.g., listen to, respond to, delete, keep, make, etc.) offline, at a time and location convenient to them. After completing their messaging activities, users then reconnect to the Mitel NuPoint Messenger server and resynchronize their mailbox and address book.

7.5 NP VIEW 1.2 (MITEL NUPOINT MESSENGER SOFTWARE RELEASE 6.1B AND ABOVE)

NP View 1.2 provides enhancements to the Server and Client software feature. The following is a description of the new capabilities:

- Caller ID Capture and Look-up: If the Switch integration to the Mitel NuPoint Messenger server supports Caller ID capture, NP View will display the outside caller's telephone on NP View Inbox screen, in the same field as the mailbox number. The end-user will be able to input the caller's name plus add it to a personalized address listing.
- Calls Identified over NP Net: When a message is received from another Mitel Corporation server that is using NP Net the caller's name is identified on the NP View inbox screen.
- Calls Identified over VPIM: With Mitel NuPoint Messenger Rel. 7.0, when a message is received from another VPIM-enabled server, the caller's name is identified on the NP View inbox screen.
- Select Multiple Messages in a Folder to Delete: An end-user can select more than one message in a folder and delete them all at once.
- Delete a Non-Empty Local Folder: This enhancement allows the end-user to delete a folder that this files without having to delete the files first from the folder.
- Audit Receipts: The new capability enables the end-user to resend a message to another user because the receipt contains the originally recorded message.
- Splash Screen: A new login screen has been added for launching NP View.
- GCOS Support: The System Address Book will only display people that an end can successfully send a message too.
- Distribution List Protection: The end-user can no longer delete the protected personal distribution lists set up by the system administrator (lists 01 and 09).
- Sound Quality Adjustments when Recording: The end-user using the "Preference" dialog box can select "Multimedia Sound Preference" and adjust either the sound quality or sound hardware compatibility during the recording of a message.

Section 8: Application Mailboxes

8.1 GREETING ONLY

Greeting Only mailboxes are used to provide information to a caller, but does not allow the caller to leave a message. There are three types of greeting only mailboxes:

- Voice greeting
- Fax greeting
- Voice and fax greeting

Voice greeting only mailboxes greet all callers with specific voice information (such as weather information or traffic reports). Callers to receive faxes on demand use faxes greeting only mailboxes. Callers who dial from a phone connected to a fax machine automatically receive a particular fax document, such as the company's annual report.

Voice and fax greeting only mailboxes allow a caller to hear a voice message and retrieve a fax with one telephone call. The voice message can describe the contents to help the caller decide whether to retrieve the fax.

8.2 TREE

Tree mailboxes route calls to pre-selected mailboxes when callers enter a single digit. The single-digit options are announced in the greeting. For example, a company's human resources information number might play a tree mailbox greeting such as *"Thank you for calling Company XYZ's human resources information number. Press 1 for benefits information, 2 for job listings, 3 for job applications..."*

Tree mailboxes can also be configured to handle rotary dialers. An FCOS bit automatically routes rotary callers to the first or last mailbox in the tree, or transfers them to the operator.

8.3 CHAIN

Chain mailboxes allow a caller to enter a mailbox number and transfer to that mailbox upon hearing the greeting. If the caller does not know the number of the party they wish to reach, they can also dial the name of the mailbox or mailbox owner.

8.4 ROTATIONAL

Rotational mailboxes allow an administrator to create audiotext applications where callers have one of a number of greetings that constantly change. Greetings change either by time and date (in a period-type rotational mailbox) or with every call (in an index-type rotational mailbox). Rotational mailboxes can be programmed as "greeting only," meaning that after a caller hears a greeting, the phone hangs up. They also can be programmed to allow the caller to leave a message after the greeting.

A movie theater can use period-type rotational mailboxes to inform callers of daily movie features. Callers on Monday hear the regular greeting, the day of the week, the feature film, and the show times for that film. Callers on Tuesday hear the regular greeting and the relevant information for Tuesday's showing, and so on.

Index-type rotational mailboxes are programmed to automatically change the greeting on a per-call basis. For example, a retail store may have ten different sales going on at a particular time. Instead of greeting each caller to the store with information about all ten, the system gives the first caller the first sale message, the second caller the second sale message, the third caller the third message, and so on. If the first caller calls the store a second time, they (will likely) hear a different sale message. Rotational, tree and chain mailboxes can be combined or used independently.

8.5 BROADCAST

Broadcast mailboxes allow both system users and outside callers to record and send a single message to multiple users. To illustrate the use of a broadcast mailbox, imagine that the manager of a company health club wants club members to know about an upcoming tournament. Instead of leaving messages for every member separately, the manager can log into their mailbox and make a message for the broadcast mailbox. The broadcast mailbox, in turn, sends the message to all of the members' mailboxes.

A broadcast mailbox's distribution list (the club members in the example above) is completely configurable by the system administrator or the end user. Each distribution list can contain up to 65,535 members.

Broadcast mailboxes can be used to send out voice messages, fax messages, or combined voice and fax messages.

8.6 NP FORMS

NP Forms is a voice forms application that gives outside callers the ability to leave messages in a way that simulates written information on paper forms. Applications include order entry, questionnaires, routine requests for information, or an overflow for a busy ACD group. Callers accessing an NP Forms application will automatically be moved through a series of prerecorded questions. The system waits for the caller to record their answer before moving on to the next question. System users who transcribe the responses can log into a single mailbox and hear an uninterrupted sequence of replies.

One example of an NP Forms application is a golf course that wishes to schedule tee times. Callers can call into a designated mailbox extension and leave their name, phone number, date and time they wish to play golf, and number of persons in their party. Callers can also have the option of transferring to an attendant in lieu of leaving the requested information, or of transferring to an attendant after leaving the information.

8.7 SHARED EXTENSION

This application is commonly used in universities and colleges. One system can be subdivided so that one telephone number accesses more than one individual. When a caller reaches a shared extension, they could hear, "You have reached the American University. To leave a message for David Thompson, please press 1. To leave a message for Jim Smith, press 2. To leave a message for George Johnson, press 3." The general greeting can easily be changed and the system can also be configured so that an outside caller does not hear a general greeting.

8.8 VIRTUAL MAILBOXES

This application is used for providing mailboxes for people that do not have a dedicated phone. The virtual mailbox can have all the standard and additional features available for mailboxes, including personalized greetings and message notification via a pager. To retrieve messages, the virtual mailbox user will call the NuPoint Voice pilot number/line group access number and then log into the mailbox just like standard mailbox users. This gives endusers that do not have telephones the ability to receive and make personal messages. The user can access their voice mail by using a public telephone or even someone else's phone.

8.9 GUARANTEED FAX

A guaranteed fax mailbox allows the system administrator to create a "never-busy" fax machine application. If a fax machine is busy, faxes are forwarded to a "guaranteed fax" mailbox that receives and stores them, without the caller knowing it. Once received, the guaranteed fax mailbox will attempt to deliver the stored fax to the fax machine until it gets through.

8.10 WALKAWAY FAX

Walkaway fax allows callers to dial one telephone number and immediately send a fax, without a voice cover sheet, directly into a user's mailbox. The walkaway fax mailbox simultaneously listens for fax tone and plays the user's personal greeting. If CNG tone is detected, the mailbox receives the incoming fax. If none is detected, the mailbox prepares to receive a voice message.

Walkaway fax mailboxes can be configured to play the user's normal greeting upon answering or a brief, instructional prompt, followed by the user's greeting. The former is often used for mailboxes that receive both voice and fax messages and fax messages with voice cover-sheets. In this situation, the caller reaches the walkaway fax mailbox and hears the user's greeting. The caller can leave a voice message,



leave a voice message and append a fax by pressing the “Start” button on the fax machine, or just send a fax at any time by pressing the “Start” button on the fax machine.

The abbreviated prompt, which instructs the caller to “Press 1” to leave a voice message or

“Start” to leave a fax, can be used when the mailbox receives predominantly fax messages. If the caller doesn’t take action, they will hear the user’s personal greeting. Both options can be used in providing one number voice/fax mailboxes to mailbox owners.

Section 9: NP Admin, NP Config and System Management

The system administrator is responsible for creating and maintaining all mailboxes on the system. The NuPoint Voice application comes preinstalled in the Mitel NuPoint Messenger server with default values. These values can easily be changed through the Mitel NuPoint Messenger console. The system issues prompts to guide the system administrator. To receive help online, the system administrator can type “?” in response to any prompt.

All ports on the Mitel NuPoint Messenger server are assigned to line groups. Each line group, in turn, is assigned to a single application, and any programming done for that application applies to every port in the line group. The number of ports in each line group is configurable to adjust for the amount of phone traffic for each particular application.

The Mitel NuPoint Messenger server allows an administrator to perform the following tasks:

- Use NP Admin's Windows-based graphical user interface to perform system administration and network management tasks on one or more Mitel NuPoint Messenger servers
- Use Functionally Partitioned System Administration (FPSA) to enhance system security and establish unique access privileges
- Create, modify and delete mailboxes
- Perform routine maintenance of the software files
- Change the system time and date, when required
- Bill clients
- Run system reports
- Set up system wide distribution lists and broadcast mailboxes
- Build FCOS, LCOS, GCOS, RCOS, TCOS, NCOS
- Create messages of the day
- Change phone line exceptions
- Configure optional features, such as NuPoint Agent

9.1 NP ADMIN AND NP CONFIG

NP Admin is a family of products that allow you to manage one or more Mitel NuPoint Messenger servers in your network. NP Admin focuses on two major areas of system management:

1. Administration and Provisioning of the Mitel NuPoint Messenger (NP Admin and NP Admin API)
2. Network and System Management/Monitoring of the Mitel NuPoint Messenger (NP SNMP and NP Config)

NP Admin and NP Config accomplishes the following objectives:

- Provide Mitel Corporation customers with a network management solution using industry-standard protocols, including SNMP.
- Provide simplified and streamlined Mitel NuPoint Messenger server and NuPoint Voice application administration using point-and-click and pull down menus under a user-friendly graphical user interface (GUI) environment.
- Provide an administration Application Programming Interface (API) for use by third-party developers and applications to access Mitel NuPoint Messenger, Release 6.1B and later.

The NP Config products include:

- NP Admin
- NP SNMP
- NP Config
- NP Admin API
- NP SNMP MIB (packaged with NP SNMP and NP Config products)

NP Admin

NP Admin is for system administrators, telecom managers, and provisioning departments in both the CPE end-user and distributor environments. It is a client-server product that allows a Windows-based graphical user interface (GUI) client to administer a Mitel NuPoint Messenger server over a TCP/IP Network. NP Admin may also access one or more Mitel NuPoint Messenger servers remotely via SLIP or PPP.

NP Admin has three main functional areas:

1. Administration or Provisioning of mailboxes
2. Billing, reporting and statistics
3. Class of Service configuration

NP Admin supports the following features (not exhaustive list):

- Available on PC with Microsoft Windows 95 or NT
- GUI interface design using point-and-click approach.
- Supports FPSA security features
- Supports simultaneous client access to single or multiple Mitel NuPoint Messenger servers
- Utilizes reliable, connection-oriented TCP/IP protocol
- Client/Server architecture. Clients access server data using NP Admin API
- Implements Open Database Connectivity (ODBC) for RDBMS support
- Supports all major RDBMS vendors that use ODBC
- Integrated with HP OpenView
- Point Messenger server
- displays real-time hardware status using the same color conventions with HP OpenView and the underlying SNMP trap mechanism
- displays statistics through the use of SNMP queries

NP SNMP

SNMP stands for simple network management protocol. SNMP allows network managers to gather information from a system or network via an SNMP agent. The agent will report on demand back to the manager (which is a PC or workstation), or will proactively report information to the manager when an error condition occurs on the system or network.

NP SNMP is used by telecom managers, IS professionals, network operations centers and technicians to monitor one or more Mitel NuPoint Messenger servers from a centralized location. NP SNMP puts an agent in a Mitel NuPoint Messenger server, which will identify faults, errors, warnings, and traps on demand. NP SNMP follows the convention used by HP OpenView to show alarms using colors and text. The alarm conditions are:

- critical (red)
- major
- minor

- warning
- marginal
- informational

For example, if a system has a critical fault on the line card, then that entire system will show up as red on the network management platform screen.

NP SNMP may be used with any network management platform that supports SNMP v1. For example, it supports HP OpenView (Windows 3.1, Windows 95, Windows NT, and UNIX versions).

NP SNMP MIBs

NP SNMP is implemented to support the industry standard SNMP protocol as documented in RFC 1157, and supports the SNMP v1 protocol. The SNMP agent in the Mitel NuPoint Messenger server supports the following standard and private MIBs: MIB-II and DS1/E1 (standard MIBs), and VM-MIB.

SNMP Trap Agent

Included with NP SNMP is the SNMP trap agent. The trap agent supports both standard traps as documented by RFC-1215, and specific traps pertaining to the Mitel NuPoint Messenger server/sub-system. The trap agent is used by the Mitel NuPoint Messenger server to provide information to the SNMP manager (a PC or workstation with a network management application running on it, such as HP OpenView) in real time. This information can provide alerts or warnings of issues in advance of larger system faults. It benefits a customer by providing proactive warnings and information to network operations managers.

NP Config

NP Config provides a visual, graphical view of the Mitel NuPoint Messenger server components, and also statistical queries via a GUI point-and-click window. NP Config uses SNMP messages and traps to gather information from one or more Mitel NuPoint Messenger servers in a network, then conveniently displays that information in a Windows NT GUI environment. Features of NP Config include the following:

- available on PC or workstation running HP OpenView for Windows NT
- GUI interface design using a point-and-click approach
- can be launched from within HP OpenView
- graphically and logically displays the hardware configuration of a Mitel NuPoint Messenger server
- displays real-time hardware status using the same color conventions with HP OpenView and the underlying SNMP trap mechanism
- displays statistics through the use of SNMP queries

NP Config does not allow you to configure or modify a Mitel NuPoint Messenger server. Instead, it allows an operations manager or technician to view the system configuration. With NP Config, you can see a consolidated look at very valuable information to help with some of the following tasks:

- system upgrades
- troubleshooting
- system management

9.2 FUNCTIONALLY PARTITIONED SYSTEM ADMINISTRATION (FPSA)

FPSA adds a much higher level of security for system administrators. FPSA allows an administrator to limit access to operations, administration and maintenance (OA&M) functions on a departmental or individual basis. In addition, with FPSA, customers may offload or resell certain administrative functions to restricted groups within their organizations or within their customer base.

FPSA adds security in five ways. First, it can only be activated or deactivated by a special diskette, which will be shipped upon request. The person who loads the diskette (system super-user) is the one person who has access to the entire system. This person assigns passcodes, user IDs, and access privileges. There is no way to bypass the superuser passcode or to activate/deactivate FPSA without this diskette.

Second, access to any part of the system (administration menus or QNX) is controlled

by passwords and user IDs. If a password is not correct or does not match a user ID, the user cannot access that part of the system. Passwords only work for the assigned access privileges: if a user gets into billing and reporting, but doesn't have access to configuration, that person cannot change FCOS, the dialing plan, or other functions within the configuration menu. This means that only people who are trained to perform certain functions on the system can use those functions.

Third, customers can control who has access to batch commands. These are very powerful command strings available at the operating system level. Now batch commands can be made accessible only to those who are trained to use them.

Fourth, the superuser can force system administrators to change their passcodes every configurable number of days. This lessens the chance that hackers or outsiders will be able to enter the system and do damage. If an administrator/technician does not change their passcode by the specified date, they will be denied access to all parts of the system.

Fifth, FPSA provides an audit trail (if the audit trail is turned on) every time an administrator enters the system. The trail indicates user ID, name, when the system was entered, which menu was entered, and what action was taken (e.g., created 200 mailboxes, changed billing rates, ran verify). Thus, all actions performed on the system can be traced back to a specific individual.

9.3 BILLING AND REPORTING

Mitel NuPoint Messenger offers four categories of reports that provide comprehensive and detailed information for the system administrator. These reports are very useful in performing billing, diagnostic and usage functions. The four reporting categories are:

1. Statistics—eight reports that cover how system resources are used.
2. Billing—four reports that give a breakdown of charges for individual mailboxes and calculate the total amount due.

3. System information—ten reports that give specific information about how the system is configured or programmed.
4. NP CDR—an optional report that tracks in detail every voice or fax call made or received by the Mitel NuPoint Messenger server.

Statistics reports offer the administrator information on usage of line ports, speech storage, fax resources, voice recognition resources, trunks, NP Net, and messages.

Billing reports give information on the breakdown of charges for individual mailboxes by statistic, then calculate the total amount that is due. The four reports cover current and past billing statistics and statistics on terminated mailboxes.

The system information reports provide details on system configuration, classes of service, system errors, phone line exceptions and pager system access codes.

Call Detail Recorder (NP CDR) provides a comprehensive amount of detail on all calls made to or from the Mitel NuPoint Messenger server. With CDR, information such as when a call was made, how long it lasted, whether it included a fax and, if so, how many pages, is available. CDR also records information on fax messages, voice messages, and pager notifications to telephone numbers anywhere in the world. CDR is in standard ASCII text and can be exported to an offboard program for further editing and formatting.

In addition to the above reports, Outdial Billing to Calling Card allows mailbox owners to be billed automatically for outcalls made from the Mitel NuPoint Messenger server. CPE customers have been asking for an easier, more reliable way to bill back for long distance and toll calls made from the Mitel NuPoint Messenger server. Long distance and toll “outcalls” made from the Mitel NuPoint Messenger server include off-system messaging, call placement, NP WakeUp, fax retrieval and paging.

With outdial billing to a calling card, all long

distance and toll calls are charged to the mailbox owner's calling card at the time of the call. A new limits class of service (LCOS), which specifies a minimum billed outcall number length, defines long distance and toll calls. Outcalls greater than or equal to this length are billed to the mailbox owner's calling card.

9.4 ADMINISTRATION BY TELEPHONE

Many of the system administration activities can be done over the telephone. This is quite useful when the administrator is away from the console or is located at some distance from the administrator's workstation. Functions that can be performed by phone include:

- Creating, deleting and modifying mailboxes
- Changing mailbox passcodes
- Changing the system clock
- Getting usage statistics

A number of security features have been added to the Mitel NuPoint Messenger server to prevent break-in and manipulation from the administrator's mailbox. For example, the system only allows five seconds of response time for each prompt before it announces “no change” and returns to the administration menu.

9.5 SYSTEM BACKUP AND RESTORE

Frequent data backups are a very important precaution against inadvertent loss or destruction of data or system information files. The Mitel NuPoint Messenger server backups are easy because they can be performed while the system is processing calls.

Data can be restored from floppy backups selectively or in its entirety. In the process, all information is restored except speech (e.g., messages and greetings).

All mailbox and configuration data, mailbox name speech, and mailbox greetings may also be backed up to a Zip drive. Data can also be restored from Zip drives selectively or in its entirety.

9.6 MESSAGE PURGE

Both voice and fax messages can be purged automatically based on message age. The Mitel NuPoint Messenger server allows administrators to define different purge limits for each of the following types of messages:

- Unplayed voice messages
- Unplayed fax messages
- Saved voice messages
- Saved fax messages
- Urgent voice messages
- Urgent fax messages
- Voice message receipts
- Fax message receipts
- Paging receipts

These message retention limits may be configured system wide or on an individual mailbox basis for maximum flexibility.

9.7 TELNET ACCESS

System administrators may login to the Mitel NuPoint Messenger server through multiple methods. First, they may login through the console using a serial port connection. Alternatively, they may dial up remotely using a modem into a serial port. Finally, administrators of the Mitel NuPoint Messenger server may administer the system through Telnet access over a TCP/IP network. The latter provides for faster throughput and use of existing local area networks.

Section 10: Security

Mitel Corporation has consistently led the industry in providing system security features at the system level and the mailbox level. The Mitel NuPoint Messenger server offers a high degree of protection for system management, administration and maintenance, mailbox usage, and access to network facilities, applications and information.

At the record level, all information and database records, regardless of format, are stored on the Mitel NuPoint Messenger server in a proprietary Adaptive Digital Pulse Code Modulation (ADPCM) algorithm developed by Mitel Corporation. Hard disks are formatted by the factory to accept information through this proprietary encryption method. Additional security is provided for the database through a proprietary file and record format.

At the mailbox level, the first level of security is protection through passcodes. The Mitel NuPoint Messenger server can be configured to require passcodes on all mailboxes. Moreover, users can be required to have minimum passcodes of up to 10 digits, and the system administrator can change this at any time to a number between 4 and 10. No trivial passcodes (simple series, same as mailbox number, or all same number) are allowed. If the wrong passcode is input when someone is trying to get into a mailbox, the caller must put the correct passcode in twice or the system will hang up. Hackers will not know if the second attempt was correct; callers are not prompted for the correct number of passcode digits nor are they told what was the incorrect entry.

If a high number of incorrect passcodes have been attempted, the system will notify the user at the next login. The system also can be configured to lock a mailbox after a configurable number of incorrect passcodes have been entered. Only the system administrator can unlock the mailbox, set a new temporary passcode, reset the tutorial, and require reinitialization from the integrated telephone number.

Various access limits can be applied to the Mitel NuPoint Messenger server through the Limits Class of Service (LCOS) to control outcalling capabilities from the mailboxes themselves. Limits can be placed on the number of digits that may be dialed from a mailbox (4 for

inhouse extensions, 7 for local calls and 10 for paging calls to an 800 number). Limits also can be placed on an individual mailbox session length, causing the system to hang up when the limit is reached. This session limit can be lowered if hackers have threatened a system.

Using RCOS, limits can be placed on the actual digits that are dialed (NPA/NXX screening) from a particular mailbox. Screening can take place at both the toll (central office) and area code (long distance) level. In addition, limits can be placed on the interaction between mailboxes through the Group Class of Service (GCOS). The GCOS of a particular mailbox determines if it may interact with any other mailbox on the system. For example, the GCOS could prohibit a messaging mailbox from accessing an audiotext one, or a mailbox on the system from accessing through NP Net a remote mailbox on the same system.

Enhanced security is available for all system administration functions on the Mitel NuPoint Messenger console through Functionally Partitioned System Administration (FPSA). FPSA allows an administrator to create different access privileges, user IDs and passwords for each administrator on the system. Moreover, FPSA provides an audit trail of all system activity and the respective administrator.

10.1 DISASTER RECOVERY

Mitel Corporation offers multiple disaster recovery solutions. First, Mitel Corporation maintains at all times a stock of ready-to-ship systems in the event of a natural disaster or a major system failure. Second, Mitel Corporation maintains a spare parts depot on both the West and East coasts of the United States. Finally, using NP Net, a backup system can be configured in a different location that mirrors in every way the primary system. Reprogramming the switch allows mailbox owners to use the same pilot number to reach their mailboxes, enter their existing passwords, and hear their current name speech and greetings, without ever knowing that they have been moved to the remote system. This function is derived from the Mitel NuPoint Messenger server's ability to broadcast messages, greetings, name speech and passcodes to one or more remote systems.

Section 11: Networking

11.1 VOICE PROFILE FOR INTERNET MAIL (VPIM)

Mitel NuPoint Messenger servers from Mitel Corporation can break the global distance and time barriers by opening the gateway to real-time messaging solutions via the Internet. The Mitel NuPoint Messenger server supports the Voice Profile for Internet Messaging (VPIM) standard, making the voice/fax messaging process as quick and easy as sending an email. Your organization will enjoy higher levels of productivity and greater cost savings as you open new doors to global voice/fax communications.

The Mitel NuPoint Messenger family lets you connect all corporate messaging in one central network, saving on network charges by sending voice files at low cost and high speed over your existing TCP/IP network.

Mitel NuPoint Messenger and VPIM protect your investment in “other” voice mail systems by letting you exchange messages seamlessly with other VPIM-compliant voice-messaging systems.

Companies with Mitel NuPoint Messenger VPIM-enabled servers will be exchanging voice/fax messages at the enterprise level (via intranets), between business partners (via extranets) and between open communities of users (via the Internet).

VPIM is an industry standard for connecting dissimilar voice messaging systems in order to exchange voice and fax messages efficiently and cost effectively. VPIM enables these systems to exchange voice and fax messages across TCP/IP-based corporate intranets and the Internet.

The VPIM specification is a MIME profile that enables messaging servers to encode and exchange messages via SMTP with any other SMTP/MIME-capable server over TCP/IP. VPIM-enabled messages are ESMTP/MIME compound messages that leverage the latest developments in digitally compressed audio and fax imaging technologies.

Leverage VPIM Capabilities with the Ease of NP View

To guarantee Mitel NuPoint Messenger users can take full advantage of VPIM capabilities, BPI provides its NP View graphical user interface (GUI) as an easy-to-use, consistent window to the messaging world. With the addition of NP View, Mitel NuPoint Messenger users can process voice and fax messages using either a telephone user interface (TUI) or the NP View GUI on the PC.

With NP View, user's can access voice and fax messages using the same GUI interface, regardless of what administration solution is chosen (VPIM or NP Net).

- The NP View window displays all Network messages, with the sender's number displayed in the mailbox field, the subject in the subject line field and the sender's name in the name field.
- NP View accepts a “Network telephone number” of any length (from VPIM or NP Net) in the free-form addressing field.
- A message from NP View addressed by a “Network Address” will be sent, along with a subject line and message addressing options, to the NP Voice portion so it is processed like a Network message created by entering a telephone number.

User Benefits

Mitel NuPoint Messenger users now have quick, convenient voice and/or fax access to users of other servers—by laptop, PC, telephone or cell phone—using familiar BPI tools and processes:

- Make (“M”) and give (“G”) messages to users on any VPIM-enabled message server—regardless of manufacturer of recipient's system
- Play (“P”) a message from another VPIM-enabled server and reply (“R”) to the sender's server without re-entering the destination address (telephone number)
- Send messages to distribution lists comprised of both local users and users of VPIM-enabled remote systems—regardless of remote system manufacturer
- Leverage broadcast distribution of messages

(intentional messaging) capabilities needed by workgroups, without the need for conversation or other real-time involvement between the sender and the individual recipients

- Receive and display or print a fax
- Enter a remote user's telephone number and send a voice and/or fax compound message, or forward a compound message to others using another VPIM-enabled system
- Verify the target recipient with spoken name confirmation using the recipient's existing Network mailbox application
- Receive Delivery Status Notifications (DSN) on messages sent
- Assign Normal, Urgent or Private status to messages being sent

System Administrators Benefits

Mitel NuPoint Messenger system administrators will likewise have the benefit of using familiar tools in a VPIM-enabled environment.

Administrators can manage VPIM billing information, Enhanced Call Detail Recording (ECDR), usage statistics and configuration information using NP Net products.

Administrators can also configure and control a VPIM-enabled system using NP Net product configuration utilities:

- Network Dialing plan for defining network mailboxes
- Network queues for delivery schedules and priorities of network messages
- Network Node Table for initiating a connection to a remote node/server
- Network Class of Service (NCOS) for controlling a user's privileges, such as answering, making or giving messages across the network

11.2 NP NET

NP Net provides the critical messaging tool that links the members of your team to your company and to your strategic partners. It links multiple Mitel Corporation systems voice and fax servers into one, highspeed global messaging network. NP Net bridges geographic distances and time zone differences by allowing you to send messages to and receive responses back from your

field sales organization, your sister divisions, your suppliers and your customers at any hour, day or night. You can send voice and fax messages to anyone or any group on the network from any phone or NP Viewenabled PC. NP Net over TCP/IP is a new product available on the Mitel NuPoint Messenger server. The NP Net Async product from Mitel Corporation is also available in Mitel NuPoint Messenger, as well as for Mitel Corporation systems running Software Release 5.0X.

Capacity to Spare

Voice messaging systems have been effectively utilized to facilitate communications between people located within single buildings or campuses. NP Net extends your communications reach by networking multiple Mitel NuPoint Messenger servers into a single messaging community. Mitel Corporation sets a new high water mark for global messaging capacity. With Mitel NuPoint Messenger and NP Net, you can provide voice and fax messaging to a large metropolitan area, a multinational Fortune 100 company, or even a small country. NP Net supports links up to 1,500 Mitel NuPoint Messenger servers, supporting millions of users.

High Fidelity Messaging

NP Net's digital networking delivers high fidelity voice messaging even over noisy transmission lines. All messages are digitally encoded and files transferred from server to server with automatic error detection. There is no accumulative distortion from multiple transmissions.

NP Net TCP/IP, which is available in all Mitel NuPoint Messenger and above platforms, provides highspeed message transfer between servers over standard Ethernet. Net throughput varies depending on the Mitel NuPoint Messenger server model and other network traffic.

Internet Compatible

With the Mitel NuPoint Messenger server, NP Net can take advantage of your existing corporate network to transport messages from server to server using TCP/IP. This means NP Net TCP/IP is fully compatible with the Internet. You can use the Internet or private Internet service providers, such as AT&T and MCI, to connect

your servers together. For small, very affordable configurations that have occasional network messaging, NP Net supports lowcost, dialup modems. Depending on your messaging traffic, you can design your network to use analog lines, ISDN, 56 kbps lease lines, or E1/T1 lines.

Interoperate with Third Party Voice Mail

Communicating with suppliers and customers is critical to any business. You can set up your Mitel NuPoint Messenger server to use AMIS Analog to send and receive voice messages from nearly all third-party voice mail platforms. In addition, to reduce toll call charges, you can use NP Net to forward your messages to the nearest Mitel system, then use AMIS to deliver it to the third-party voice mail platform.

Scalable Servers

Mitel NuPoint Messenger servers are scalable. You can start with a module system supporting up to 60 ports (2 E1 connections), expand it to a 4 module system, and then network multiple systems together using NP Net to support up to 360,000 ports. Depending on the level of network message traffic and the number of servers supported, you can use a 10 Mbps Ethernet LAN to deliver up to 20,000 network voice messages per day (assuming 30 seconds/message, 18.3 kbps speech encoding).

Minimize Networking Costs

In some cases, Mitel NuPoint Messenger servers will be connected via dialup lines (e.g., POTS, switched 56, or ISDN). To effectively minimize the cost of network charges, each Mitel NuPoint Messenger server can be configured to accumulate messages in a queue until a certain threshold is exceeded, and then send all the accumulated messages at once across the network to their final destination. Different types of thresholds include; number of messages in queue, cumulative number of minutes messages have waited, total length of messages waiting, or time of day. System managers can set each of these thresholds to optimize the balance between cost and delivery delays.

There also are separate queues for normal and urgent delivery messages. The administrator can set lower thresholds for urgent messages, allowing them to get delivered faster. The sender has the option of marking their message urgent or normal. Records are kept on all network messages so appropriate billing or cost allocations can be performed.

Upgrading Basic NP Net Networks

Mitel NuPoint Messenger servers can support both NP Net TCP/IP and Async NP Net. The Ethernet card and the serial (RS232) card must be installed in separate modules. Network message throughput between hightraffic locations can be improved by replacing existing Async NP Net networks with a TCP/IP network. Mitel NuPoint Messenger servers must maintain a hybrid NP Net TCP/IP and basic network configuration until every node has been upgraded to TCP/IP.

11.3 AMIS

AMIS Analog is a Mitel NuPoint Messenger server networking application that allows Mitel NuPoint Messenger servers to communicate with other vendors' voice mail systems. With this optional feature installed, mailbox owners can send messages, receive messages, and answer messages received from remote voice mail systems.

Any mailbox owner who has AMIS Analog feature can make and give messages from the local system to any other systems equipped with AMIS Analog capabilities. Any message that cannot be delivered will be returned to the message maker with a reason for nondelivery. When a message is received from another system, the mailbox owner may answer that message with a single keystroke.

Mitel Corporation offers AMIS Analog to send and receive voice messages from nearly all third-party voice mail servers. You can transfer your message via NP Net over your lowcost network to a nearby Mitel Corporation system and then deliver it to the recipient's voice server over AMIS. Mitel Corporation has enhanced AMIS Analog in Mitel NuPoint Messenger to provide the same universal dialing plan capabilities provided by NP Net.

Section 12: PBX Integrations

Switch integrations establish a connection between a telephone switch and the Mitel Corporation Mitel NuPoint Messenger server. This connection provides call information for direct or forwarded calls and message waiting signals for the user, and is transparent to both callers and users. When the telephone switch and the Mitel NuPoint Messenger server are integrated, the two systems interact to give capabilities that neither system alone could provide. For example, an outside caller is automatically forwarded to the personal greeting of the called party, instead of reaching the main greeting and having to reenter the parties extension. In addition, a caller can return to an operator after reaching voice mail, without having to hang up and redial.

The Mitel NuPoint Messenger server uses four different methods to integrate with a customer's private branch exchange (PBX) or central office; enhanced inband, data link, in-channel and electronic set emulation.

12.1 METHODS FOR PBX INTEGRATION

Enhanced Inband where the switching system and the Mitel NuPoint Messenger server communicate with one another using an exchange of tones in the voice frequency band (inband).

Data Link—where the switching system and the Mitel NuPoint Messenger server communicate with one another using a special data communications circuit, separate from the voice channel.

In-Channel— where the Mitel NuPoint Messenger server acts as an electronic telephone within the switching system.

Electronic Set Emulation— where the Mitel NuPoint Messenger server extracts from electronic telephone sets within the telephone switching system and presents it to the Mitel NuPoint Messenger server.

Switch integrations establish a connection between a telephone switch and the NuPoint Messenger system. This connection provides call information for direct or forwarded calls and message waiting signals for the user, and is

transparent to both callers and users. When the telephone switch and the NuPoint Messenger system are integrated, the two systems interact to give capabilities that neither system alone could provide. For example, an outside caller is automatically forwarded to the personal greeting of the called party, instead of reaching the main greeting and having to re-enter the party's extension. In addition, a caller can return to an operator after reaching voice mail, without having to hang up and redial.

The NuPoint Messenger system uses three different methods to integrate with a customer's private branch exchange (PBX) or central office: call in-band DTMF, direct data link, and electronic set emulation. The NuPoint Messenger platform also supports two additional integrations with telephone switching networks: R2 and SS7.

12.2 IN-CHANNEL INTEGRATION

In-Channel Integration is available in Mitel NuPoint Messenger Software Release 6.1 and above. In-Channel integration is available for the Lucent PBX Models, Definity series version G2 and G3, the Mitel PBX models, SX-200D, SX-200 Light and the SX-2000, as well as, Nortel SL1 release 21 and 23.

The In-Channel Integration is a combined hardware and software optional feature that integrates a Mitel NuPoint Messenger communications system with a PBX. The In-Channel Integration is a totally digital integration that requires no loop start, E&M or T1/E1 cards for its operation. Instead, it utilizes two different card types to communicate with the PBX:

- Digital Signal Processor (DSP) Cards—these cards perform all dialing, digit detection and speech processing.
- Digital Set Emulation (DSE) Cards—these 8-port cards emulate digital telephone sets.

A caller is sent (either on a forward or a direct call, in the case of a user retrieving messages) to a DSE port in the Mitel NuPoint Messenger server. Since the DSE port emulates a digital telephone set, the display information about the call is sent to the port as well. The Mitel NuPoint



Messenger server reads the display information, determines the proper greeting to play, and answers the call. All speech is processed on the DSP port via the MVIP bus. The caller is answered on the DSE port and remains on that port for the duration of the call.

Loop start, E&M, or digital ports may be used for outdial applications such as paging, Automated WakeUp, NuPoint Fax, message delivery, and message waiting.

Applications not requiring integrations such as NuPoint Agent, ARII, Audiotext, NP Forms, etc., can use either separate analog ports or the DSE ports.

Section 13: Architecture

The Mitel NuPoint Messenger server is a modular, open, standards based communications server that allows users to make, send, receive, and answer voice, fax, and email messages from a single mailbox, 24 hours a day, by using a touch-tone telephone or a PC. In addition, users can access any information service—in any format (voice, text, and image)—from the same mailbox. The system requires no special environmental conditions, and is compatible with virtually every PBX and switching system. The Mitel NuPoint Messenger server can accommodate from 50 to thousands of users economically because of our modular expandable system architecture (MESA) design strategy.

13.1 THE MESA DESIGN STRATEGY

Many voice processing companies have product lines with different models designed to serve specific capacity points. Each system in the product line has to be completely replaced whenever a customer outgrows it. At Mitel Corporation, we believe that the investments our customers make in our products are worth keeping. A basic principle of our MESA design is that our systems can be expanded in the field.

Mitel NuPoint Messenger servers do not have fixed port/storage configurations. New applications, new information formats, new storage and new ports can be added independently. Service bureaus, whose users are charged for the amount of time that messages are stored on the disk, require a greater ratio of ports to storage hours. Corporate customers, whose employees tend to keep messages, typically want more storage. The MESA design allows our customers to buy only what is needed. All this flexibility is without penalty, since each growth point is designed to be cost effective when compared to competitors' models that specialize at that system size.

Modular expansion is only one aspect of MESA design. Simplicity, the ability to incorporate the latest technology, and distributed processing are integral parts of the Mitel NuPoint Messenger server design—a design that allows us to build the best systems for today and for the future.

Keep It Simple

The platform is one of the most reliable communications servers in the industry because it is

engineered to be very simple, with redundancy options that ensure unequalled performance and uptime. Each module has only four basic components: the line cards, the CPU, the hard disk drive, and the power supply. The architecture allows for mean time between failures (MTBFs) well in excess of five years.

Use Available Technology Whenever Possible

Mitel NuPoint Messenger servers are built with commercially available, industry standard components. We can choose the most reliable hard disk drives, power supplies, and chip sets on the market. Our SCSI hard disk drives, for example, have a minimum of 150,000 hours rated MTBF; field performance is far higher.

The Mitel NuPoint Messenger server's design uses an Industry Standard Architecture (ISA) backplane bus, a MultiVendor Integration Protocol (MVIP) circuit switching bus, and either an Integrated Drive Electronics (IDE) or a Small Computer Systems Interface (SCSI) drive hardware interface. These common protocols allow our system to accept new technology as it is developed. We have been able to add digital networking, inter-processor communications, and important new software features to the Mitel NuPoint Messenger server by taking advantage of the wide range of ISA compatible cards that can be plugged into the Mitel NuPoint Messenger server backplane. Improvements in industry standard chips have enabled us to reduce the number of chips needed to perform the same functions, which controls costs and increases reliability. The recent introduction of large capacity hard disk drives that meet our stringent reliability standards allows us to offer upgrades that double the storage capacity of our systems.

The main processor for each module is either an Intel 80486 (IDE models) or Pentium (SCSI models) processor. When necessary, we can upgrade to a more powerful processor within the same family. Improvements in industry standard chips also make it possible to incorporate Very Large Scale Integration (VLSI) solutions into the Mitel NuPoint Messenger server architecture. Use of the latest technology and fewer chips reduce power needs and generate less heat than individual components, which increases system reliability.

The Mitel NuPoint Messenger server uses the QNX operating system from Quantum Software. QNX Software is a driving member of the Portable Operating System IX (POSIX) committee, which sets the standards for hardware independent operating systems. The QNX software is a 32bit operating system.

Focus Our Resources Where We Offer a Unique Advantage: In Software and Architecture

Using industry standard components and technology allows us to focus our development efforts on our unique architecture and software design, leaving component and operating system engineering to the companies that specialize in these areas.

Mitel Corporation has many of the most feature rich applications on the market today, because our standard software package provides millions of distinct classes of service and contains features that allow applications to go far beyond simple voice messaging. Also, our high density analog line cards and digital connections enable us to add direct DID trunks, T1/E1 circuits, low power options and a multifrequency (MF) signaling option on the line cards. MF allows us to interface with cellular telephone networks.

Distributed Processing

The Mitel NuPoint Messenger server's MESA architecture emphasizes distributed processing for the fastest throughput and most efficient use of system resources. Processing occurs at four levels:

1. Module level

At the module level, the main processor controls multiple port configurations. The module processor controls traffic and tracks resource allocations for all internal processing interactions. Q-Net, an internal LAN, integrates 4 Model 640 modules together at the CPU control level. Q-Net enables all modules to operate as a single system through high-level information exchange and inter-process communication (IPC).

2. Intra-module communication

Within a module, the MVIP bus switches calls between cards. This MVIP bus adheres to the computer telephony integration (CTI)

standard. The MVIP bus connects any digital telephony interfaces (such as T1/E1 lines) to the DSP cards, where voice processing occurs. Service cards (such as fax cards) can be assigned to a dedicated port or shared among a group of ports, either analog or digital.

3. Line card level

Many processing tasks are concentrated in the line cards. Each analog or digital line card contains its own 386 processor and multiple digital signaling processors (DSPs). The line cards provide signal processing (speech compression and decompression), DTMF detection, pause compression, and MF tone detection.

4. Disk drive interface

In the Model 640 system, the Monitor Control Board II manages multiple SCSI interfaces. Each SCSI interface has its own dedicated controller, which manages all disk functions and error checking for each hard disk. The Model 120R can contain up to two SCSI disk drives, while the Model 120S can contain up to four SCSI disk drives, which are controlled by a plug-in SCSI card. IDE drivers control hard disks in the Model 70 configurations.

The implementation of distributed processing by Mitel Corporation is unique in the industry. Multiple modules in the Model 640 system are linked together with multiple SCSI buses and the Q-Net, an internal LAN. The SCSI disks are reliably managed as a single database. Each module processes its own work while having fast, direct access to the common database. Database integrity is maintained by a fault-tolerant distributed file system.

A Call Scenario:

When an outside caller dials the Mitel NuPoint Messenger NuPoint Voice message center number, the call rings on a line card port. The line card detects the ringing signal, and relays the event to the module CPU. The CPU locates the system greeting on the hard disk and transfers the data from the hard disk to buffers on the line card. This buffer is divided into three rotating buffers that fill and empty in sequence, ensuring that the user never hears a pause in the playback of the greeting.

The caller enters the mailbox number in response to the system greeting. The line card recognizes the DTMF input and sends it to the CPU. The CPU interprets the DTMF tones as a mailbox number and locates the personal mailbox greeting on the hard drive. The mailbox greeting is transferred from the hard drive to the line card, where it is played to the user.

When the caller responds to the prompt to record a message for the mailbox, the module allocates space on the hard disk drive to store the message, sets up data transfer between the line card and the hard disk drive, and drops out. The speech is first digitally sampled by the line card. The line card then compresses this speech and sends it to hard disk drive for storage. This compression can be set for 18.3 kbps, 24 kbps or 32 kbps sampling rates.

When the recipient plays the message, the line card converts the 18.3 kbps, 24 kbps or 32 kbps compressed speech data back into 64 Kbits by a reverse algorithm. The result is expanded to an analog signal, which is sent out the line card port to the recipient's telephone, and the recipient hears the message.

13.2 FUNCTIONAL OVERVIEW

The Mitel NuPoint Messenger Module

The Mitel NuPoint Messenger server is modular. In the Model 640, a maximum of four modules can be connected to reach the capacity of a Mitel NuPoint Messenger server. Thus, when a customer outgrows their existing module, they can just add an additional module to it, instead of having to buy a completely new system. Each Mitel NuPoint Messenger module consists of the following 9 components: (See Exhibit 143 for an architectural diagram of a 4 module Model 640 system).

- Central Processing Unit
- Modular Controller Board
- Backplane
- MVIP Bus
- Power Supply
- Hard Disk
- Floppy Disk Drive

- Telephony interface card
- QNX Operating System

Central Processing Unit (CPU)

The CPU subsystem consists of an 80486 or Pentium-based central processor board, with 64 MB of RAM. The board plugs into the ISA backplane. In the Model 70 system, the CPU is on the motherboard. Line cards, service cards, and communications cards also plug into the ISA backplane, which provides the interface with the CPU. There are 13 ISA-compatible available slots for each Model 640 module, 10 available slots in the Model 120R and 120S, and 7 slots available in the Model 70. The backplane accepts many ISA-compatible cards, such as fax cards, line cards, DSP cards, communications cards, and T1/E1 interface cards.

The Model 70 configurations support the PC/AT IDE interface, while the 120R, 120S and Model 640 systems support the SCSI interface. A plug-in SCSI adapter card is used as the disk interface in the Model 120S. All CPU subsystems support the 1.44MB floppy interface. The CPU subsystem includes two serial ports for maintenance purposes. Optionally, a second plug-in card will handle several highspeed RS232 lines for integration with PBXs and other peripheral device needs.

In addition, the Model 640 system uses the Module Control Board II to manage I/O resources. MCB II components include:

- Four Small Computer System Interface (SCSI) bus interface controllers
- External alarm interface
- Audible alarm system
- Four asynchronous RS232 ports
- NVRAM
- Voltage, temperature, and fan rotation monitors

Backplane

Line cards plug into the backplane, which provides the interface between the line cards and the CPU board. There are 13 slots for cards in each Model 640 module, 12 slots for cards in the Model 120R and Model 120S systems and 7 slots in the Model 70. The backplane is ISA

compatible, and accepts many ISA compatible cards, such as the CPUs, line cards, fax cards, Ethernet cards and the serial cards used for RS232 type integrations and networking.

MVIP Bus

The MultiVendor Integration Protocol, (MVIP) CTI standard, bus allows telephony board products from different vendors to operator together. The Mitel NuPoint Messenger server supports such boards as shared resource fax cards, and DSP cards.

Power Supply Subsystem

The Model 640 has separate power supplies for the CPU and disk storage subsystems. There are two options for both:

- A 50 to 60Hz, 110240 VAC input 500W (nominal), autoselectable, quadruple-output (+5, +12, 12, and 48 VDC) switching power supply plus a 150W disk storage module power supply.
- A 48 VDC input, 500W (nominal), quadruple-output switching power supply (+5, +12, 12, 48 VDC) switching power supply plus a 150W disk storage module power supply.

The Model 120R and Model 120S configurations provide the following single power supply options:

- A 50 to 60Hz, 100120 VAC, 500W
- A 50 to 60Hz, 200240 VAC, 500W
- A 48 VDC, 400W (Model 120S Only)

The Model 70 configuration provides the following single power supply options:

- A 50 to 60Hz, 100120 VAC, 200W
- A 50 to 60Hz 200240 VAC, 200W

Auxiliary Equipment Subsystem

The auxiliary equipment subsystem can consist of external devices for the Model 640 system such as the CSO/IO module for switching to redundant systems resources, automatic contact closure monitoring devices, proprietary PBX or standard signaling integrations, or serial interfaces.

Hard Disk

Hard disks provide storage for the operating system, system software, mailbox and message statistics, and digitized speech. Mitel Corporation aims for the highest reliability on hard disks, by qualifying them through a rigorous burn-in and testing process. Our hard disks must meet a minimum MTBF of 150,000 hours. At least two sources are qualified for each hard disk size.

Floppy Disk Drive

All Mitel NuPoint Messenger servers are equipped with a 1.44 Mb formatted (2.0 Mb unformatted) floppy disk drive that uses 3.5" doublesided, double density diskettes. The floppy disk drive is used to open up software and hours on the Mitel NuPoint Messenger server and to back up mailbox and account data files.

Smart Installation Tool

Mitel Corporation strives to leverage technological advancements to continuously improve the products and services offered. The existing Mitel NuPoint Messenger (Series 6) platform has been modified to significantly improve the time and efficiency required for installation of software features and prompts.

The Smart Install feature in Release 7.0 will introduce CD ROM distribution of software and prompts for Mitel NuPoint Messenger. The Mitel Corporation Team selected external CD ROM capabilities to allow customers to leverage their existing Series 6 hardware platforms.

Smart Install enhances the efficiency required for installation of base and optional software features and prompts on the Mitel NuPoint Messenger System by reducing the numerous floppy diskettes previously required for installation to two CD ROMs and two floppy diskettes.

System Software and Standard Prompts

All base and extra cost software and standard prompts are loaded from the "Standard" CD into the system.

Custom Prompts (i.e., such as hotel)

Custom prompts will be loaded from the "Prompts Custom 1" CD. Any custom prompts created after the latest revision of the "Custom

Prompts 1” CD will be loaded from the “Prompts Custom 2” CD.

Refer to Configuration Note 51 for further information on Smart installation tool.

Line Cards

Line cards provide the interface between the Mitel NuPoint Messenger server and telephone lines from a PBX or central office trunk. Line interfaces can be either analog or digital trunks. (See Appendix III for a list of line card interfaces supported by the Mitel NuPoint Messenger server). The phone line exceptions program and the algorithms for digitization and speech compression are stored on the line card.

Line cards monitor all of the telephony events that occur on the network. The line card runs software that interprets events based on the signal pattern that the line card receives. The event can be a busy signal, a ring-no-answer, a reorder tone, or a human voice. The program also allows the line card to detect silence and pauses. The parameters used to interpret these events are based on North American signaling practices. They may need to be adjusted to comply with parameters used in other countries (see Table 4).

Analog

Direct Inward Dial (DID): The ability for a caller outside a company to call an internal extension without having to pass through an operator or attendant. At the Central Office switch the area code and prefix are stripped once the number is identified as a DID telephone number assigned to a company.

E&M Signaling: A pair of wires that connect two PBXs or a PBX to a remote extension over a voice grade line. The “E” lead or EAR, receives an open or ground signal from the far end and the “M” lead or MOUTH, transmits a ground or battery condition to the signaling equipment. A 48 volt-age change on the leads indicates information such as seizure to transmit recognition of seizure, release of circuit, dialed digits, etc. Of the 5 types of E&M signaling, Mitel Corporation supports type I and type II.

Loop start: A two-wire circuit that forms a loop when a station goes off-hook to answer a ring event. The ringing event is trigger by the central

office sending AC voltage to the ringer of a telephone. When the telephone handset is removed from the cradle, a DC loop is formed. This action bridges a resistance of the tip and ring, both wires, of a telephone line. The central office recognizes the DC loop and discontinues the ringing event to the set.

Digital

T-1 Signaling: A digital transmission link standard used by the United States, Canada, Hong Kong and Japan. A T-1 link has 24 channels that operate at 64Kbps each for a total of 1.544 megabits per second capacity.

E-1 Signaling: The European digital transmission link. An E-1 has 30 channels for transmitting voice data at 64Kbps per channel, plus a 64Kbps for signaling and a 64 Kbps channel for framing and maintenance. The E-1 carries information at a rate of 2.048 megabits per second.

Line Parameters

The console program provides a menu-driven interface for configuring line parameters. Appendix II lists some common phone line parameters that might need to be reconfigured for countries other than the United States.

A silence-detection algorithm in the line card software eliminates pauses at the beginning of, during, and after speech recordings and reduces storage requirements. The algorithm identifies silence even on a noisy line. If necessary, Automatic Gain Control (AGC) increases the sound level of the speech when messages are played back.

Different types of line exceptions are described below. For a list of most used line exceptions, see Appendix II.

- Timeout parameters—Line exception timeout parameters help control port usage by minimizing the amount of time between call processing events. Each of these line exceptions is set to a value that ensures successful completion of the first event, without allowing excess time to elapse before the next event begins.
- Incoming signal detection—Line card ports use these line exceptions to monitor the telephony interface and detect incoming signals.

- Output signaling adjustments—These line exceptions control the signaling and tones needed to dial out for pagers, message delivery, and off-system messaging applications.
- DTMF detection—The Mitel NuPoint Messenger server receives events in the form of DTMF tones. Some aspects of DTMF detection can be customized for individual line card ports.
- Greet command parameters—The greet command, used for call progress and line signal monitoring, is a general-purpose software routine resident on the line card. It detects speech, recorded announcements, dead lines, and call-progress tones such as ringback, busy, and reorder. When the Mitel NuPoint Messenger server application software instructs a line card port to “wait for a greeting,” the greet command uses digital signal processors to detect tones and speech.
- Speech and silence detection during recording—These parameters work together to detect speech pauses. They stop the system recording when a pause has occurred and restart the recording process once speech has resumed. This function can be enabled or disabled.

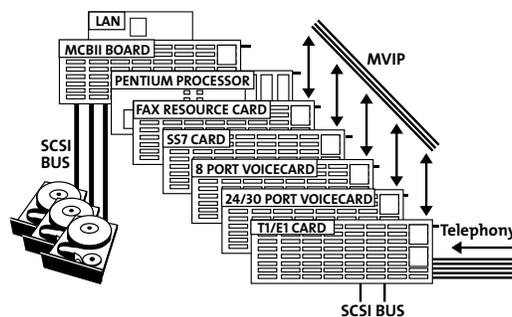
Serial Ports

The Mitel NuPoint Messenger server supports serial ASCII access for maintenance via any of the serial ports. An outboard modem is used for remote maintenance functions and is connected via a serial port. The CPU in each model supports two serial ports. The Model 640 has four additional serial ports on the MCBII board. The Model 120R, Model 120S and Model 70 need an additional serial card to support more than two serial connections. Maintenance normally is performed using either a serial VT-100 compatible terminal or a personal computer with VT100 terminal emulation. Up to 16 terminals (4 per module on a Model 640) may be connected at one time. A terminal is connected to serial port one and the outboard modem can be connected to any of the remaining serial ports.

The QNX Operating System

The ability of Mitel Corporation to grow its platform modularly and distribute processing among its components is due, in large part, to its operating system. The Mitel NuPoint Messenger server uses the QNX operating system. QNX has a modular design that can control all system realtime functions and applications by using state-of-the-art microkernel, message-passing architecture. Operating system functions such as file handling network management, device I/O, and other functions, are performed by a series of accessible modules known as server tasks. These tasks communicate with each other through a technique known as message passing, where a block of data (the message) is copied from the data space of one task to that of another. A microkernel provides synchronization of task switching and message passing. QNX switches between tasks many thousands of times per second, and the switching is controlled by a process called “prioritized preemptive event scheduling,” which ensures that the most important tasks get CPU processing time when needed.

Exhibit 14-1: Module Architecture





Packaging Options

The Mitel Corporation Mitel NuPoint Messenger server is available in four different packaging

options: the Model 70, Model 120R, Model 120S, and the Model 640 system. Exhibit 142 below outlines each system's specifications.

Exhibit 14-2: System Specifications

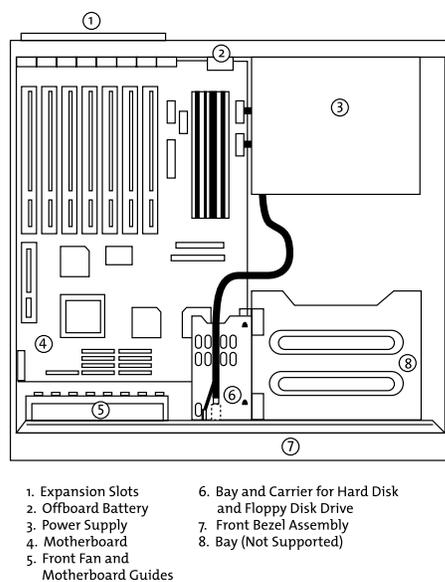
SPECIFICATION	MODEL 70	MODEL 120R	MODEL 120S	MODEL 640
Number of Ports	4-32	4-38	8-60	8-240
Hours of Speech Storage: Redundant	90 or 210	110 or 210	120-960	120-2880
Non-redundant	90 or 210	110 or 210	120-960	120-5760
Cabinet Size: Height	6.25" (15.9 cm)	25.5" (64.8 cm)	25.5" (64.8 cm)	36.75" (93.3 cm)
Width	16.35" (41.6 cm)	7.35" (18.7 cm)	7.35" (18.7 cm)	17" (43.2 cm)
16.75" (42.6 cm)	16.5" (41.9 cm)	16.5" (41.9 cm)	12" (30.5 cm)	Weight
25 lbs (11.3 kg)	25 lbs (11.3 kg)	121 lbs (54.9 kg)		21 lbs (9.5 kg)
Heat Dissipation (Typical)	314 BTU/hr	512 BTU/hr	1877 BTU/hr	1877 BTU/hr
Operating Temperature	50° F to 95° F (10° C to 35° C)	50° F to 95° F (10° C to 35° C)	50° F to 95° F (10° C to 35° C)	40° F to 100° F (4° C to 50° C)
Non-Operating Temperature	35° F to 120° F (2° C to 49° C)	40° F to 158° F (40° C to 70° C)	35° F to 120° F (2° C to 49° C)	35° F to 120° F (2° C to 55° C)
Relative Humidity - Operating	85% at 95° F non-condensing	85% at 95° F non-condensing	85% at 95° F non-condensing	20% to 55% non-condensing
Agency Approvals	NRTL/C, CSA, FCC Parts 15 & 68, IC CS03, ICES-003 EN60950, EN55022, CSIPR22, BABT	NRTL/C, CSA, FCC Parts 15 and 68, ICCS03, ICES-003 EN60950, EN55022, CSIPR22	NRTL/C, CSA, FCC Parts 15 and 68, ICCS03, ICES-003 EN60950, EN55022, CSIPR22	CSA NRTL/C, FCC Parts 15 and 68, EN60950, EN55022 CSIPR22, BABT
Power Input	110/220 VAC only	110/120 VAC 150 W only	110/220 VAC or -48 VDC	110/220 VAC, 550 W (TYP) or 48 VDC
Power Draw: 110/120V 220V/240 48V	9.2 Amps 4.6 Amps	9.2 Amps 4.6 Amps	9.2 Amps 4.6 Amps	9.2 Amps 2.5 Amps 12.5 Amps

A. Model 70

The Model 70 PC-style desktop chassis sits conveniently on a surface and is ideal for small areas. This system consists of:

- An Intel 486 CPU motherboard with 64 MB base system memory, 200 watt power supply and a floppy disk drive.
- Up to two hard disks (IDE interface), which stores system software, prompts, messages, mailbox account, and database information for a maximum of 210 hours of redundant storage.
- Up to seven full slots are available and a maximum 32 ports can be configured.

Exhibit 14-3: Model 70



B. Model 120R

The Model 120R system is housed in an upright floorstanding PC-style tower. It consists of:

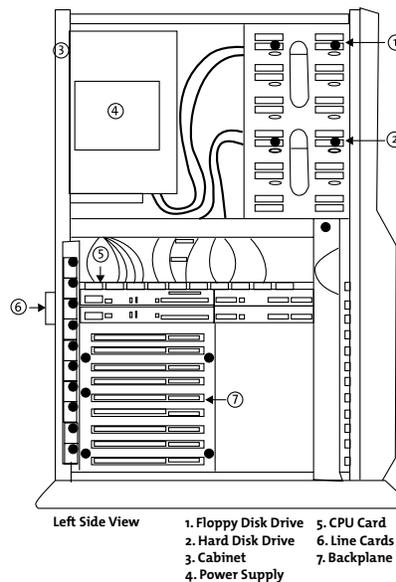
- A Pentium Plugin CPU and a backplane that supports up to 10 available slots, with a maximum of 48 ports. Its hard disk interface is SCSI and can support up to 2 hard disks for a maximum redundant speech-storage capacity of 210 hours.
- A floppy disk drive and an internal power supply.

C. Model 120S

- The model 120S consists of a Pentium Plug-in CPU and a backplane that supports up to 10 available slots, with a maximum of 60 ports. Its hard disk interface is SCSI and can support up to 4 hard disks for a maximum redundant speech-storage capacity of 960 hours.
- It also includes a floppy disk drive and an internal power supply.

The system can be expanded by adding ports or by installing both ports and storage.

Exhibit 14-4: Model 120



D. The Model 640 System

The MESA design strategy has evolved to include individual assemblies for each component type. The result is the Model 640 (see Exhibit 145). The base Model 640 system consists of:

- A storage assembly with one hard disk, one floppy drive
- A CPU assembly that includes a backplane and up to 15 card slots
- A power supply assembly with a single power supply



The power supply and storage assemblies have their own cooling systems. All assemblies are designed for mounting on standard 19" telephony racks.

Individual power leads run from the power supply assembly to the CPU, and to a low voltage sensor located on the CPU board. A SCSI bus connects the CPU and the hard disks. The floppy disk drive is connected to the CPU by a separate standard bus.

The Model 640 is the optimal configuration for expansion, since the base system uses only a small portion of each cabinet.

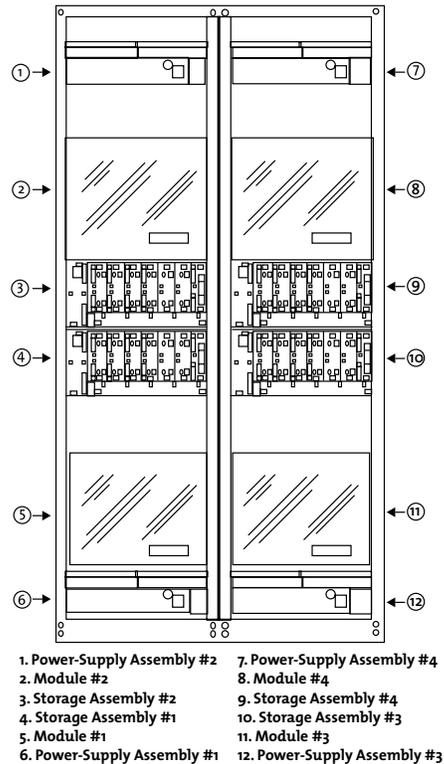
- The disk storage assembly can house up to four hard disks and one floppy disk drive, giving a maximum storage capacity per module of 960 hours redundant/1900 hours nonredundant. Also housed in the disk storage assembly is a 150 watt power supply, which supplies power to all of the drives.
- The CPU assembly holds a single CPU board, a backplane, and can support a maximum of 60 ports per module.
- The power supply assembly holds a 500 watt power supply, which provides enough power to service one full CPU module loaded with the maximum number of cards. It is capable of monitoring system functions such as fan operations, temperature, and power source fluctuations.

D.1 Multi-Module Operations

What happens when we take the architecture and expand it across multiple modules? When we build a large capacity system, or grow a 60 port system to a 240 port system, all modules operate as a single system with a single database, not a virtual single database created by networking separate systems together. QNX has built in peer to peer networking, which allows the setup and control of tasks on any processor across the network. Whether the tasks are executing on the same processor or on physically remote processors does not matter. The MESA architecture takes advantage of the capability by distributing processing tasks between microprocessors on the line cards and on the CPU. In addition, on a multi-module system, an entire bus (the Q-Net bus) is reserved exclusively for CPU to CPU message passing.

The Q-Net bus acts as a highspeed LAN that transmits all control functions between the master and slave modules. This maintains central control over the distributed processing functions in a multi-module system. All communications between disk drives and line cards, including database information and speech information, occur over the SCSI bus. The speed of the Q-Net bus, carrying limited control information, ensures that multi-module systems perform as efficiently as a single module system. For faulttolerant needs, a second Q-Net bus is added to ensure that CPU to CPU communication is uninterrupted.

Exhibit 14-5: Model 640



Ports on a multi-module Model 640 system have equal access to system resources, no matter where they are located. Running on the main module processor is a program called "Master," which remembers where all information is located on the hard disk. In a multi-module system, this program resides on the primary module. When a call comes in on a line card, the line card tells the

module, "This is a call for mailbox 569." Master downloads the information needed to process the call onto the line card. If a call comes in on the second module for the same mailbox, the second module sends a message to the first module over the Q-Net bus. Module 1 sends a copy of the necessary information on mailbox 569 to the second module, also over the Q-Net bus. The second module now knows where all the pointers are, and it can set up a data transfer between the line card in the second module and the common hard disk across the extended SCSI bus. Master is updated in real-time as changes are made in mailbox parameters and/or pointers.

This dualbus operation is in contrast to pure networked systems, which do not have the extended SCSI bus. The following is an example of a pure networked system: A call comes into the Module 1 line card port, but the information needed resides in Module 3. The line card port in Module 1 speaks to the CPU in Module 3. Its CPU retrieves the information from the hard disk drive in Module 3. The information is transmitted back across the local area network to the CPU in Module 1. The line card in Module 1 pulls the data from the CPU's RAM in Module 1. Access to a disk comes through a line card in that module or through the CPU. This type of design requires multiple database manipulation and support.

Conversely, our architecture allows the system to work from a single database. Any line card can talk directly to any disk in the system to deposit or retrieve digitized speech, without having to go through a tier of module processors that either buffer the speech, or control each separate disk. Primary module intervention is required only when information is added to or deleted from a hard disk. This makes real-time processing possible even at the highest traffic levels, when all ports are active at the same time.

NP CSO software provides a redundant "hot" standby of all primary module "master" programs. These programs will reside on the second module and be switched over as the "active" master programs for the remaining modules if the primary module fails. The hardware component of NP CSO is the I/O module, which monitors the primary module, and should a fault be detected, it will move the hardware connections to the backup module. Hardware

connections include the console, modem, printer, and a datalink switch integration.

D.2 Fault Tolerance

The Model 640 platform has a high degree of fault tolerance when configured with its NP CSO option, Redundant Drive option and the Alarm Monitor Power Supplies (AMPS). There is NO single point of system failure in the architecture. The platform multi-module packaging confines failures to the module level.

A failure affects only a CPU module. With 4 modules composing a 240port system, only 25 %, or 60 ports maximum, will be put out of service. Even multiple CPU module power failures will not take out the total system.

A failure of a disk storage module power supply will put its disk module out of service, but with disk redundancy, the redundant disks—residing in other disk storage module—will run the system without loss of functionality or system resources.

Any module has direct access to any disk, including its redundant disk that resides on a redundant bus. The Mitel NuPoint Messenger server does not require any functionality in adjacent modules. Most other vendors' systems require messages to go over a system bus between modules to access disks that are packaged with line cards. This type of architecture requires at least one other system bus and processors in both modules to function in order to pass messages between modules.

The ISA bus is implemented at the CPU module level with up to 15 cards plugged into the module ISA bus. There is no system wide bus that all the cards plug into; therefore, there is no bus failure that can disable all the cards. Many competitors have a systemwide bus that can fail and disable all cards on that bus, EVEN redundant CPUs.

The Q-Net bus is redundant and used for CPUtoCPU communications. Two Q-Net cards plug into each module. The ISA bus in each module is isolated from the systemwide Q-Net buses. A Q-Net card failure will not disable the module in which the Q-Net card failed.

The Model 640 platform software does NOT have a single point of system failure that will disable

the entire system. The NP CSO (CSO) option will use the processors in each module as functionally redundant system processors. There will be a STANDBY copy of all System Resource tasks on a CPU in another module as a backup to the CPU of the ACTIVE Primary module. If the Primary module goes out of service, the NP CSO software will activate the STANDBY system resource tasks for use by all other line card modules within 5 to 40 seconds. In conjunction with the I/O module, resources will also move the standby module.

D.3 Hard Disk Redundancy

Since hard disk drives are electromechanical devices, they are more prone to failure than circuit boards and chips. A drive failure is also the most serious type of system breakdown, since irreplaceable stored speech and data are lost, rather than simple functionality for the time it takes to replace the part. For this reason, Mitel Corporation offers full hard disk redundancy across Mitel NuPoint Messenger.

When redundancy is configured, the system writes to both hard disks, one immediately after another, in a technique called “shadow writing.” To guarantee integrity between the primary and redundant disks, whenever the NuPoint Voice application writes to a redundant disk pair, whether to store a message or to record a change to the database, both disks must confirm that the task is finished before the controlling application registers the task as finished. If one of the disks does not report back to the application, the application will retry the operation. If the retry fails again, the faulty disk will be put out of service. A deactivated hard drive can be removed from the drive storage module and a new hard drive inserted while the system continues to process calls.

Mitel NuPoint Messenger recognizes the difference between a primary and a redundant disk, but the system does not always read from the primary hard disk, even under normal operating conditions. Both primary and redundant disks are “mirrored” in that they contain the same information. Thus, if a traffic queue starts to build up to a primary drive, the system automatically forms a connection to the secondary drive, processes the call, then shadow-writes the information back to the primary drive.

Redundancy is a cost-effective way to provide

insurance against a fault or a problem in the primary drive and to improve system throughput in high-traffic situations.

When the NuPoint Voice application encounters bad information on a primary disk, the system reads the information from the redundant disk immediately. The failure will be unknown to the system user, and will require no intervention. The system marks the bad sector on the primary disk, and recopies the information from the redundant disk as a background function, without interrupting the operation of the system.

In the event of a catastrophic disk crash, the NuPoint Voice application transfers immediately to the redundant disk. When the failed disk is replaced, the system begins the shadow writing process for all new operations. In addition, the system restores the unduplicated information to the new disk as an ongoing background function; full redundancy will be restored within a few hours, with no downtime, and no impact on multi-mode system users. On a single-module system, there is a maximum of 15 minutes downtime to activate the new hard drive.

13.3 SHARED RESOURCE FAX

NuPoint Fax application resources may be shared across multiple NuPoint Voice application ports. Customers do not need to dedicate a NuPoint Fax resource to a NuPoint Voice application port. Instead, a NuPoint Fax resource can be shared by assigning it to multiple NuPoint Voice ports. If a call comes into one of the ports on the NuPoint Voice line group and the caller requests a NuPoint Fax resource, the system “switches” the call over to the NuPoint Fax resource available to that NuPoint Voice line group. If none is available, the caller will be prompted that “All fax lines are busy.” To ensure the availability of NuPoint Fax resources, an administrator may dedicate NuPoint Fax resources to NuPoint Voice ports in a 1:1 ratio. For more information on NuPoint Fax shared resources, please see Product Note 21.

Shared Resource Fax Configuration Example

As an example, if a Mitel NuPoint Messenger server is going to be used for voice messaging, paging notification, and fax mail. Voice messaging requires an incoming NuPoint Voice port that listens for dial tone, DTMF and line breaks. In this example, we'll assign two line ports to the NuPoint Voice inbound line group. Paging notification requires an outgoing port, so we'll assign one port to the paging outbound line group. Fax mail requires an inbound port to receive an incoming fax (when callers send faxes into users' mailboxes). Fax mail also requires an outgoing port for users to download their faxes to fax machines. Because Mitel NuPoint Messenger has NuPoint Fax shared resource capability, however, we don't need to assign two separate ports to fax mail. Instead, we can assign one fax resource to the NuPoint Fax line group. The resource in this line group can be used to perform both incoming and outgoing fax mail functions. How do we do this? By assigning this NuPoint Fax group to the NuPoint Voice inbound line group, and also to the paging outbound line group. It now becomes a fax resource for both incoming functions (accepting fax messages and depositing them in users' mailboxes) and outgoing functions (allowing mailbox owners to download their fax messages to fax machines).

Call Flow for Shared Resource Example (Discussed Above):

A call flow that maps to this server configuration would be the following. An outside caller, George, dials a Mitel Corporation user's (Mary's) telephone number. Mary is not in her office, so

the call is forwarded to voice mail, and George records a message. This function used one port on the NuPoint Voice inbound line group. Mary has paging capabilities in her mailbox, so she is paged when this new message arrives. This function uses one port on the paging outbound line group. Mary gets the page, notifying her of a new message, and she dials into her mailbox to retrieve that message. This function takes one port on the NuPoint Voice inbound line group.

A few hours later, George dials Mary's fax telephone number to leave her a fax. The call is answered by a port on the inbound line group. As soon as the port answers the call, it hears fax CNG tone and knows to "switch" (over the MVIP bus) the call over to the fax resource on the NuPoint Fax group servicing that NuPoint Voice line group. The fax resource hears the CNG tone, sends CED tone (the tone that establishes the connection with the sending fax machine) back, and receives the fax from George and deposits it in Mary's mailbox. Mary is again paged because she has received a new message, and she dials into the system to hear her new message. This uses a port on the NuPoint Voice inbound line group. When Mary downloads the fax to a fax machine, this uses the fax resource on the NuPoint Fax group.

If a second caller calls into the system while Mary is downloading the fax, they will not be able to leave their fax message because the one and only fax resource on the system is busy. They will be played a prompt stating that "all fax lines are busy." Because there is just one resource in the NuPoint Fax group, it can only service one call at a time.

APPENDIX I: Class of Service Descriptions

FCOS FEATURE BITS BY CATEGORY

Category 1: Greeting Features

- 060 Ignore dual tone multiple frequencies (DTMFs) during greeting
- 062 Hang up immediately after greeting

FCOS FEATURE BITS BY CATEGORY

Category 1: Greeting Features

- 060 Ignore dual tone multiple frequencies (DTMFs) during greeting
- 062 Hang up immediately after greeting
- 063 Call mailbox attendant after greeting
- 064 Call mailbox user extension after greeting
- 065 Play system time after greeting
- 161 Conditional greetings
- 162 General greetings
- 164 Skip/pause greeting in greeting-only mailbox
- 224 Autotransfer to task before greeting

Category 2: Login Features

- 001 Login to mailbox
- 016 Deny recycling with * key
- 066 Login during greeting in greet-only mailbox
- 069 Passcode required for mobile DID
- 081 Only one correct passcode for login
- 093 Deny change of passcode in first tutorial
- 101 Deny login on line group 1
- 102 Deny login on line group 2
- 103 Deny login on line group 3
- 104 Deny login on line group 4
- 105 Deny login on line group 5
- 106 Deny login on line group 6
- 107 Deny login on line group 7
- 108 Deny login on line group 8
- 109 Deny login on line group 9
- 130 Passcode cannot be same as mailbox
- 132 Bad passcode lockout if over limit
- 151 Deny 333 access for mobile DID

- 152 Deny login within tree
- 156 Deny login after greeting
- 160 Caller must enter linegroup access code
- 165 Pound Key (#) login
- 218 Passcode NOT needed on direct calls
- 219 Login with o using cut-through paging
- 225 Autotransfer to task upon login

Category 3: Logout Features

- 003 Return to welcome prompt
- 009 Automatic logout if no unplayed messages
- 170 Transfer to Voice Gateway
- 220 No dial extension, email, or Voice Gateway if unplayed messages

Category 4: Attendant Call Features

- 002 Transfer to mailbox attendant
- 013 Operator transfer via "6" key
- 098 Say "Press o" to caller before beep
- 159 Say "Press o to return to receptionist"

Category 5: Outside Caller Features

- 002 Transfer to mailbox attendant
- 004 Outside caller functions
- 005 Play outside caller menu prompts
- 017 Fast line release from outside caller
- 041 Receive messages from outside callers
- 051 Do not switch language for outside callers
- 092 User will be in Dial-by-Name database
- 098 Say "Press o" to caller before beep
- 111 Deny message receipt on line group 1
- 112 Deny message receipt on line group 2
- 113 Deny message receipt on line group 3
- 114 Deny message receipt on line group 4
- 115 Deny message receipt on line group 5
- 116 Deny message receipt on line group 6
- 117 Deny message receipt on line group 7
- 118 Deny message receipt on line group 8
- 119 Deny message receipt on line group 9
- 137 Caller must enter access code
- 160 Caller must enter line group access code

- 176 Say "Press # for more options" to callers
- 203 Walkaway fax for callers
- 221 Deny caller transfer to email/Voice Gateway (custom feature)
- 264 CLI outside caller interface enabled

Category 6: Prompts Features

- 051 Do not switch language for outside callers
- 082 Soft play (interrupt) message count
- 083 Soft play (interrupt) most prompts
- 097 Do not say, "I will ring <name>" in AR
- 098 Say "Press o" to caller before beep
- 131 Don't say limits of liability statement
- 133 Don't say: "You may start your message now"
- 136 Don't say: "End of message"
- 138 Don't say: "Message complete"
- 140 Say full date when playing messages
- 146 Don't say, "NuPoint Voice storage is full"
- 157 Repeat message for answering machine
- 159 Say "Press o to return to receptionist"
- 163 Don't play message count
- 176 Say "Press # for more options" to callers
- 202 Do not play mailbox name or extension number
- 208 Play reorder tone after cut through paging or greet-only
- 209 Tone Only Pager mailbox interface
- 210 Numeric Display Pager mailbox interface
- 211 Voice Pager mailbox interface
- 247 Don't play any prompt to fax call placement recipient

Category 7: Receive Messages Features

- 039 Notification tone when new message arrives
- 040 Receive messages from other users
- 041 Receive messages from outside callers
- 043 Receive message of the day
- 044 Receive user distribution list messages
- 045 Receive master distribution list messages
- 046 Announce receipt count at login
- 047 Notification prompt when new message arrives

- 088 Receive urgent messages
- 111 Deny message receipt on line group 1
- 112 Deny message receipt on line group 2
- 113 Deny message receipt on line group 3
- 114 Deny message receipt on line group 4
- 115 Deny message receipt on line group 5
- 116 Deny message receipt on line group 6
- 117 Deny message receipt on line group 7
- 118 Deny message receipt on line group 8
- 119 Deny message receipt on line group 9
- 127 Deny receipt of messages before tutorial run
- 173 Receive Cut-through Page notify receipt
- 175 Receive broadcast greeting
- 179 Receive broadcast name
- 185 Receive Wakeup Call notification receipt
- 190 Receive fax messages
- 198 Receive fax messages only
- 199 Auto-receipt for fax send
- 223 Delay requested receipt for 24 hours
- 262 CLI stored as telephone number
- 263 CLI stored as mailbox or telephone number

Category 8: Play Messages Features

- 006 Rewind and fast-forward during playback
- 007 Pause in record or play
- 039 Notification tone when new message arrives
- 046 Announce receipt count at login
- 047 Notification prompt when new message arrives
- 048 No auto-timestamp of unplayed messages
- 049 No auto-timestamp of played messages
- 050 Play messages
- 052 Autoplay unplayed messages
- 057 Play saved messages in first in, first out (FIFO) order
- 058 Play unsaved messages in FIFO order
- 059 Play unplayed messages first
- 075 Audit receipt message
- 076 Play urgent messages in FIFO order
- 089 Autoplay all messages (new and saved)

144	Skip forward to next message	126	Make/Give to mailbox with empty GCOS
145	Message stays in original queue	157	Repeat message for answering machine
147	Send receipt after full play	158	Continue sending message (* key)
153	Don't jump to new message from saved queue	168	Message wait 1, Pager re-queue
204	Message skip, forward and backward	169	Message wait 2, Pager re-queue
215	Don't auto-play first message (w/auto-play)	171	Cut-through paging
216	Play receipts after urgent messages	172	Cut-through paging and messaging
255	Delete mailbox without unplayed messages	188	Append # at the end of Cut-through page
		191	Make fax messages
		265	Enable NP RapidDial Features

Category 9: Answer Messages Features

019	Answer and mark urgent
029	Answer messages
030	Answer and request receipt
031	Answer and mark confidential
038	Attach original message to answer
147	Send receipt after full play
158	Continue sending message (* key)
265	Enable NP RapidDial Features
270	Enable NP Boomerang

Category 10: Keep/Discard Messages Features

053	Keep messages
054	Auto-keep messages
055	Discard messages
056	Auto-discard messages
145	Message stays in original queue
227	Undelete last message with * key

Category 11: Make Messages Features

020	Make messages
021	Make and request receipt
022	Make to multiple destinations
023	Make and mark confidential
032	Make to user distribution list
034	Make to master distribution list
061	Wait to record (timeout = # key)
087	Make and mark urgent
092	User will be in Dial-by-Name database
096	Make messages before keep/discard
110	Make/Give to telephone number

Category 12: Give Messages Features

018	Give and mark urgent
024	Give messages
025	Give and request receipt
026	Give to multiple destinations
027	Give and mark confidential
028	Give with comments
033	Give to user distribution list
035	Give to master distribution list
061	Wait to record (timeout = # key)
084	Give receipt message with comments
085	Give receipt message to multiple destinations
086	Give receipt message (Master)
110	Make/Give to telephone number
126	Make/Give to mailbox with empty GCOS
157	Repeat message for answering machine
158	Continue sending message (* key)
192	Give fax messages

Category 13: Message Addressing Features

018	Give and mark urgent
019	Answer and mark urgent
021	Make and request receipt
023	Make and mark confidential
025	Give and request receipt
027	Give and mark confidential
030	Answer and request receipt
031	Answer and mark confidential
084	Give receipt message with comments
085	Give receipt message to multiple destination

- 087 Make and mark urgent
- 095 Mark message for future delivery

Category 14: User Options

- 015 Change wakeup options
- 070 User options menu
- 015 Change wakeup options
- 071 Record or change mailbox name
- 072 Record or change mailbox greeting
- 073 Enter and change mailbox passcode
- 074 Create or modify user distribution list
- 077 Change pager schedule
- 078 Activate user tutorial
- 093 Deny change of passcode in first tutorial
- 094 Change message delivery options
- 095 Mark message for future delivery
- 124 Change paging phone number
- 125 Clear user passcode
- 127 Deny receipt of messages before tutorial run
- 130 Passcode cannot be same as mailbox
- 142 Must run tutorial from own phone (SMDI)
- 143 Change message delivery phone number
- 148 Change auto-wakeup phone number
- 180 Record personal wakeup message
- 195 Specify fax delivery number
- 196 Change default fax number
- 201 Deny trivial passcode
- 249 Allow transfer to help desk during tutorial

Category 15: User Distribution List Features

- 032 Make to user distribution list
- 033 Give to user distribution list
- 036 Auto-receipt for user distribution list messages
- 044 Receive user distribution list messages
- 074 Create or modify user distribution list
- 134 Broadcast message waiting status
- 222 Disallow nesting of distribution list

Category 16: Master Distribution Lists Features

- 034 Make to master distribution list
- 035 Give to master distribution list
- 045 Receive master distribution list messages

Category 17: Check-In/Check-Out Features

- 008 Mailbox can be checked in/out
- 090 Check-in other mailboxes
- 091 Check-out other mailboxes

Category 18: Special Function Mailboxes

- 068 Define Rotational mailbox
- 120 Default to first child of tree mailbox
- 121 Define Tree mailbox
- 122 Define Broadcast mailbox
- 123 Announce broadcast mailbox name
- 128 Family Head
- 129 Host mailbox
- 141 Define Chain mailbox in Receptionist
- 147 Send receipt after full play
- 152 Deny login within tree
- 174 Define Broadcast Greeting mailbox
- 178 Define Broadcast Name mailbox
- 186 Default to last child of tree mailbox
- 187 Receptionist call-transfer tree mailbox
- 189 Rotate on full mailbox
- 229 Play names of list 1 children

Category 19: Message Waiting Light Features

- 079 Set message waiting #1 for urgent messages only
- 080 Set message waiting #2 for urgent messages only
- 134 Broadcast message waiting status
- 182 Use primary/alternate as week/weekend for message waiting indication (MWI) 1
- 183 Use primary/alternate as week/weekend for MWI 2
- 205 Do not use text count for message waiting
- 228 Set message waiting #3 for urgent messages only
- 234 Check message wait status of children



LIMITS CLASS OF SERVICE (LCOS)

PARAMETERS

Log-In

Log-In Sessions Per Period

Billing Period

Category 20: Fax Features

- 190 Receive fax messages
- 191 Make fax messages
- 192 Give fax messages
- 193 Deliver fax to default number
- 194 Deliver fax online
- 195 Specify fax delivery number
- 196 Change default fax number
- 197 Fax-on-demand for Greeting Only mailbox
- 198 Receive fax messages only
- 199 Auto-receipt for fax send
- 200 Personal fax cover page
- 203 Walkaway fax for callers
- 206 Discard fax message after delivery
- 207 Fax Verify (sending system not self)
- 230 Deny change of fax cover page options
- 235 Display FROM filed on fax cover page
- 236 Display promotional message on fax cover page
- 237 Automatically deliver fax message to default number
- 238 End-of-session multiple fax delivery
- 239 Retrieve all unplayed faxes through user options
- 240 Receive fax on voice recording timeout
- 247 No fax call placement prompts
- 256 Play abbreviated prompt before greeting

Category 21: Paging and Message Delivery Features

- 077 Change pager schedule
- 124 Change paging phone number
- 168 Message wait 1, Pager re-queue
- 169 Message wait 2, Pager re-queue
- 171 Cut-through paging (CTP)
- 172 Cut-through paging and messaging
- 173 Receive cutthrough page notify receipt

- 181 Paging over message delivery, MWI 1 over MWI 2
- 188 Append # to end of cut-through page number
- 208 Play reorder tone after cut-through page or greet-only
- 209 Tone Only Pager mailbox interface
- 210 Numeric Display Pager mailbox interface
- 211 Voice Pager mailbox interface
- 212 Send page upon answer, greet-only mailbox
- 213 Edit CTP number with * key if no caller menu
- 219 Login with o using cut-through paging

Category 22: Network & Voice Forms

- 135 Define template mailbox (NP Forms)
- 139 Template: assume last greet mailbox FCOS
- 149 Login to template through rotational mailbox
- 166 AMIS Analog networking
- 231 Passcode Broadcast mailbox
- 232 Allow receipt of passcode broadcasts
- 241 Suppress broadcast forced receipt

Category 23: NP View

- 110 Make/Give to telephone number
- 250 Allow NP View login
- 251 Allow NP View telephone playback/record
- 252 Allow NP View client to change mailbox ID
- 257 Prevent NP View client voice playback/record
- 258 Prevent NP View client from using local storage
- 259 Restrict NP View client to play only faxes
- 260 Allow NP View user to have Caller ID lookup
- 261 Allow NP View EB access to messages
- 262 Store Caller Line ID as a phone number
- 263 Store Caller Line ID as a phone number or mailbox number
- 264 Play outside caller user interface for NP CLI

FCOS DESCRIPTION – COMPLETE LISTING

001	Login to mailbox	048	No auto-timestamp of unplayed messages
002	Transfer to mailbox attendant	049	No auto-timestamp of played messages
003	Return to welcome prompt	050	Play messages
004	Outside caller functions	051	Do not switch language for outside callers
005	Play outside caller menu prompts	052	Auto-play unplayed messages
006	Rewind and fast-forward during playback	053	Keep messages
007	Pause in record or play	054	Auto-keep messages
008	Mailbox can be checked in/out	055	Discard messages
009	Automatic logout if no messages/receipts	056	Auto-discard messages
013	Operator transfer via “6” key	057	Play saved messages in FIFO order
015	Change wakeup options	058	Play unplayed messages in FIFO order
016	Deny recycling with * key	059	Play unplayed messages first
017	Fast line release from outside caller	060	Ignore DTMFs during greeting
018	Give and mark urgent	061	Wait to record (timeout = # key)
019	Answer and mark urgent	062	Hang up immediately after greeting
020	Make messages	063	Call mailbox attendant after greeting
021	Make and request receipt	064	Call mailbox user extension after greeting
022	Make to multiple destinations	065	Play system time after greeting
023	Make and mark confidential	066	Login during greeting in greet-only mbx
024	Give messages	068	Define Rotational mailbox
025	Give and request receipt	070	User options menu
026	Give to multiple destinations	071	Record or change mailbox name
027	Give and mark confidential	072	Record or change mailbox greeting
028	Give with comments	073	Enter and change mailbox passcode
029	Answer messages	074	Create or modify user distribution list
030	Answer and request receipt	075	Audit receipt message
031	Answer and mark confidential	076	Play urgent messages in FIFO order
032	Make to user distribution list	077	Change pager schedule
033	Give to user distribution list	078	Activate user tutorial
034	Make to master distribution list	079	Set message wait #1 for urgent messages only
035	Give to master distribution list	080	Set message wait #2 for urgent messages only
036	Auto-receipt for user dist list msgs	081	Only one correct passcode for login
038	Attach original message to answer	083	Soft play (interrupt) most prompts
039	Notification tone when new msg arrives	084	Give receipt message with comments
040	Receive messages from other users	085	Give receipt message to multiple destinations
041	Receive messages from outside callers	086	Give receipt message
043	Receive message of the day	087	Make and mark urgent
044	Receive user distribution list messages	088	Receive urgent messages
045	Receive master distribution list messages	089	Auto-play all messages (new and saved)
046	Announce receipt count at login	090	Check in other mailboxes
047	Notification prompt when new message arrives	091	Check out other mailboxes



092	User will be in Dial-by-Name database	136	Don't say: "End of message"
093	Deny change of passcode in first tutorial	137	Caller must enter access code
094	Change Message Delivery options	138	Don't say: "Message complete"
095	Mark message for Future Delivery	139	Template: assume last greet mailbox FCOS
096	Make messages before keep/discard	140	Say full date when playing messages
097	Do not say "I will ring <name>" in AR	141	Define Chain mailbox in Receptionist
098	Say "Press o" to caller before beep	142	Must run tutorial from own phone (SMDI)
101	Deny login on line group 1	143	Change message delivery phone number
102	Deny login on line group 2	144	Skip forward to next message
103	Deny login on line group 3	145	Message stays in original queue on hangup
104	Deny login on line group 4	146	Don't say "VoiceMemo storage is full"
105	Deny login on line group 5	147	Send receipt after full play
106	Deny login on line group 6	148	Change Auto-Wakeup phone number
107	Deny login on line group 7	149	Login to template thru rotational mailbox
108	Deny login on line group 8	152	Deny login within tree
109	Deny login on line group 9	153	Don't jump to new message from saved queue
110	Make/Give to telephone number	155	Payphone user/recipient interface
111	Deny message receipt on line group 1	156	Deny login after greeting
112	Deny message receipt on line group 2	157	Repeat message for answering machine
113	Deny message receipt on line group 3	158	Continue sending message (* key)
114	Deny message receipt on line group 4	159	Say "Press o to return to receptionist"
115	Deny message receipt on line group 5	160	Caller must enter linegroup access code
116	Deny message receipt on line group 6	161	Conditional greetings
117	Deny message receipt on line group 7	162	General greetings
118	Deny message receipt on line group 8	163	Don't play message count
119	Deny message receipt on line group 9	164	Skip/pause during greeting of Greeting-only mailbox
120	Default to first child of tree mailbox	165	Pound key (#) login
121	Define Tree mailbox	166	AMIS Analog Networking
122	Define Broadcast mailbox	168	Message wait 1, Pager re-queue
123	Announce broadcast mailbox name	169	Message wait 2, Pager re-queue
124	Change paging phone number	171	Cut-through Paging
125	Clear user passcode	172	Cut-through Paging and Messaging
126	Make/Give to mailbox with empty GCOS	173	Receive Cut-through Page notify receipt
127	Deny receipt of messages before tutorial run	174	Define Broadcast Greeting mailbox
128	Family Head	175	Receive broadcast greeting
129	Host Mailbox	176	Say "Press # for more options" to callers
130	Passcode cannot be same as mailbox	178	Define Broadcast Name mailbox
131	Don't say limits of liability statement	179	Receive broadcast name
132	Bad passcode lockout if over limit	180	Record personal wakeup message
133	Don't say: "You may start your messages now"	181	Paging over message delivery, MWI1 over MWI2
134	Broadcast message waiting status		
135	Define Template mailbox (MesaForms)		

182	Use pri/alt as week/weekend for MW1	225	Auto-Transfer to task upon login
183	Use pri/alt as week/weekend for MW12	226	Auto Transfer to task after unplayed messages
185	Receive Wakeup Call notification receipt	227	Undelete last message with * key
186	Default to last child of tree mailbox	228	Set message wait #3 for urgent messages only
187	Receptionist call-transfer tree mailbox	229	Play names of list 1 children
188	Append # to end of Cut-through page number	230	Deny change of fax cover page options
189	Rotate on full mailbox	231	Passcode Broadcast mailbox
190	Receive fax messages	232	Allow receipt of passcode broadcasts
191	Make fax messages	234	Check message wait status of children
192	Give fax messages	235	Display FROM field on fax cover page
193	Deliver fax to default number	236	Display Promotional Message on fax cover page
194	Deliver fax online	237	Automatically delivers fax message to default number
195	Specify fax delivery number	238	End-of-session multiple fax delivery
196	Change default fax number	239	Retrieve all unplayed faxes through user option
197	Fax-on-Demand for Greeting Only mailbox	240	Receive fax on voice recording timeout
198	Receive fax messages only	241	Suppress Broadcast forced receipt
199	Auto-receipt for fax send	242	Say variable passcode prompts for business guest mailboxes (not recommended for hotel use)
200	Personal fax cover page	247	Don't play any prompt to fax call placement recipient
201	Deny Trivial Passcode	249	Allow Transfer to Help Desk during tutorial
202	Do not play mailbox name or extension number	250	Allow OneView login.
203	Walkaway fax for callers	251	Allow OneView telephone playback/record.
204	Message Skip, forward and backward	252	Allow OneView client to change mailbox ID
205	Do not use text count for message waiting	254	Turn on Mailbox Message Trace
206	Discard fax message after delivery	255	Delete mailbox if no unplayed messages
207	Fax Verify (sending system not self)	256	Enable fixed greet 'Press 1 or wait' for walkaway fax
208	Play reorder tone after CTP or greet-only	257	Prevent OneView client voice playback/record.
209	Tone Only Pager mailbox interface	258	Prevent OneView client from using local storage.
210	Numeric Display Pager mailbox interface	259	Restrict OneView client to play only faxes.
211	Voice Pager mailbox interface	260	Allow OneView user to have Caller ID lookup.
212	Send page upon answer, greet-only mailbox	261	Allow OneView WEB access to messages.
213	Edit CTP number with * key if no caller menu		
215	Don't auto-play first msg (w/auto-play)		
216	Play receipts after Urgent messages		
217	Announce text messages without count		
218	Passcode NOT needed on direct calls		
219	Login with o using Cut-through paging		
220	No dial ext, email, or VG if unplayed messages		
222	Deny nesting of distribution lists		
223	Delay requested receipt for 24 hours		
224	Auto-Transfer to task before greeting		



- | | | | |
|-----|--|-----|---|
| 262 | Store Caller Line ID as a phone number | 280 | Enable CLI Outside caller interface (with FCOS bit 264) |
| 263 | Store Caller Line ID as a phone or mailbox number | 281 | Enable Boomerang manual callback number option 'N' |
| 264 | Play outside caller user interface (with FCOS bit 280) | 282 | Enable Call Screening in MBOD for Callers and Users. |
| 265 | Enable Rapid Dial Features | 283 | Say number of unplayed messages on last logout |
| 270 | Enable Boomerang Feature | 284 | Provide Callback Number Delivery Options |
| 276 | Press zero for more info feature | 286 | To allow Mailbox to accept calls without charge |
| 277 | Send Mail Waiting Notice after Mailbox Deletes | | |
| 279 | Enable TollSaver for outsider leaving message | | |

LIMITS CLASS OF SERVICE (LCOS) PARAMETERS

LogIn

- LogIn Sessions Per Period
- Billing Period

Speech Recording

- Name Speech Length
- User Message Length
- Outside Caller Message Length
- Greeting Length
- Network Message Length
- Call Placement Message Length

Distribution List

- Number of Lists Per Mailbox
- Number of Members Per List
- Minimum Number of Recipients for Receipt Summary

Messages

- Number of Messages Per Mailbox
- Number of Messages Per Billing Period
- Minimum Message Length
- Maximum Recipient Count

Outdialing

- Maximum Digits Allowed
- Call Placement RNA/Busy Retry Count
- Call Placement RNA/Busy Interval Count
- Message Delivery Phone Length
- Message Delivery Login Delay
- Maximum Pages in Billing Period
- NP WakeUp Phone Length
- Maximum Wake-Ups Per Billing
- Maximum Days - NP WakeUp
- Maximum Days - Reminder Call
- Maximum Reminder Calls Per Billing
- Maximum Destinations Per Reminder Call
- Paging Phone Length
- Maximum Pages Per Billing Fax Retrieval

Fax Limits

- Number of Fax Messages Per Mailbox
- Maximum Digits for Fax Message Delivery
- Fax Delivery Retry Frequency
- Fax Delivery Retry Interval
- Purge Schedules
- Unplayed Voice Message Retention
- Played Voice Message Retention
- Urgent Voice Message Retention
- Voice Receipt Retention
- Page Receipt Retention
- Unplayed Fax Message Retention
- Played Fax Message Retention
- Urgent Fax Message Retention
- Fax Receipt Retention
- Absolute Message Retention

Paging/Message Delivery

- Number of Retry Attempts for Alternate
- Time Interval for Alternates

Miscellaneous

- Future Delivery Message Count
- Future Delivery Maximum Days
- Maximum Attachments on "Give"
- Maximum Attachments on Network
- Maximum NP View Inactivity Time Out
- Network Queue Message Count
- Maximum Family Members or Guest
- Message Waiting Indicator Message Length

Prompts

- American English (Mnemonic)
- American English (Numeric)
- Canadian French
- Cantonese
- Danish (Custom)
- German
- Japanese (Not in 6.1)



- Korean ISO
- Mandarin
- Brazilian Portuguese
- Australian English
- New Zealand English
- British English
- Latin American Spanish
- Mexican Spanish
- Argentinean Spanish (Custom)
- Chilean Spanish (Custom)

**NETWORK CLASS OF SERVICE (NCOS)
CAPABILITIES**

- Access a GCOS across the network
- Make a network message
- Make an urgent network message
- Give a network message
- Give an urgent network message
- Answer a network message
- Answer an urgent network message
- Receive automatic receipts for network messages
- Receive a network message
- Receive an "Urgent" network message
- Limit the number of network message attachments
- Broadcast a change of name and/or greeting across the network
- Make a network fax message
- Give a network fax message
- Answer a network fax message

APPENDIX II: Line Card Exceptions

TIMEOUT PARAMETERS:

#1 Start record no speech time

This parameter sets the maximum amount of time the NuPoint Voice application waits for speech after issuing the “beep” that prompts a caller or system user to record a message or greeting. If no speech is detected, the NuPoint Voice application terminates the record sequence and issues the prompt “Nothing recorded.”

#2 Stop record timeout

This parameter specifies the maximum interval of continuous silence allowed during the recording of a message or greeting. Silence intervals that are less than the stop record timeout are interpreted as pauses; once the stop record timeout is exceeded, the NuPoint Voice application terminates recording and plays the prompt “End of message.”

#9 Ringing timeout

The ringing timeout defines the time period that must elapse after the line card detects ringing before a call is treated as a “Ring/No Answer.”

#35 Sleep after hang up

After the NuPoint Voice application goes onhook, it ignores a ringing event for the amount of time set by this parameter. This timeout ensures that the system is ready to issue the proper greeting when it answers the next call.

#38 Centrex time out

Each Centrex call comes in as a ring on the telephone line, and a data packet on an RS232 connection. Among other items, the data package contains the information necessary for the NuPoint Voice application to answer the call with a user’s personal greeting. If ringing occurs first, and a data package is not received before the Centrex time out expires, the NuPoint Voice application plays the general message center greeting. If the data packet is received first, and no ringing occurs before the Centrex time out takes effect, the system invalidates the data packet and waits for a new call.

#138 No break time after flash

After performing a switchhook flash, the NuPoint Voice application ignores all line break events for the duration set by this parameter. This prevents a disconnect following a switchhook flash.

#140 No break/ring time on loop

No break/ring time on loop is used only when a line card channel is jumpered for loop current. After a hang up or pulseout command, the NuPoint Voice application ignores line break and ringing events for the time specified by this parameter. Line exception 35 must be disabled for this line exception to be valid.

#142 Inhibit play time

After a port answers a call, the NuPoint Voice application pauses for the time specified by this line exception before playing the greeting or first prompt. The Inhibit play time is adjusted if callers are not hearing the first part of a greeting, or if callers are waiting too long before the greeting begins.

#180 Play delay after DTMF detect

This parameter specifies the time the NuPoint Voice application waits after detecting DTMF before playing a prompt, greeting, or message. Some telephone systems mute the talk path after a DTMF key is pressed; the Play delay after DTMF detect can be increased to prevent these systems from clipping off the beginning of speech after DTMF.

#182 Ringback tone maximum silence

This line exception specifies the maximum silence allowed between ringback tone cycles before a greet command terminates automatically with a speech detect event.

INCOMING SIGNAL DETECTION:

#3 Dial tone detect time

#22 Start dial tone timeout

#136 Minimum dial tone detect power

These three parameters, plus signal duration, set the criteria the NuPoint Voice application uses to determine if a signal it is receiving is a valid dial tone.

#128 Minimum busy half cycle (greet)

#174 Minimum busy detection time

#175 Maximum busy detection time

The line card uses the values set for these line exceptions, collectively, to determine if it is receiving a busy tone. When the greet command is active, a different minimum busy half cycle value (parameter #129) is used.

#172 Minimum reorder detection time

#173 Maximum reorder detection time

The line card uses the values set for these line exceptions, together with the minimum busy half cycle (greet) to determine if it is receiving a reorder tone. When the greet command is active, a different minimum busy half cycle value (parameter #129) is used.

#130 TIE trunk break detect time

When a port is jumpered for E&M interface, an M lead break greater than the time specified by this parameter is considered a disconnect.

#131 Loop break detect time

When a port is jumpered for loop current, if the PBX breaks the loop for an interval greater than the time specified by this parameter, the NuPoint Voice application considers the break a disconnect, and goes onhook.

#132 Mlead debounce time

Mlead state changes must last longer than this time to be considered valid.

#133 Delay before wink

After a valid incoming seizure, the port waits this amount of time before sending the wink start signal.

#134 In-ring on time high

#144 In-ring off time

#148 In-ring on time low

#150 In-ring maximum power

#152 In-ring minimum power

The line card port uses these parameters for incoming ringing detection.

Incoming ringing bursts must be at least as long as the in-ring ontime low value, and less than the In-ring on time high value.

There must be an interval between ringing bursts that is at least as long as the inring off-time value.

Incoming ringing power must be above the in-ring maximum power threshold to be detected.

When incoming ringing power falls below the in-ring minimum threshold, ringing detection is cleared.

OUTPUT SIGNALING ADJUSTMENTS:

#14 Pulse per second

This line exception defines the pulse per second rate for dial pulses that the NuPoint Voice application outdials.

#23 Flashhook time

This is the number of hundredths of a second that the NuPoint Voice application remains onhook during flash while transferring a call.

#24 Wink start

Wink start is a type of outsignaling capability that usually is required by the central office for DID applications. Certain PBXs also may require wink start signaling on E&M tie trunk connections. The default for this parameter is disabled.

#154 Pulse out interdigit delay

This is the amount of time a port waits between accepting a pulse output command and starting the pulse output of digits.

#164 DTMF output duration

This is the length, in hundredths of a second, of each DTMF tone the NuPoint Voice application outdials.

#166 DTMF interdigit delay

This is the amount of silence, in hundredths of a second, between each DTMF tone that the NuPoint Voice application outdials.

#176 DTMF output level

This sets the amplitude of DTMF tone output.

DTMF DETECTION:**#6 DTMF detect enabled/disabled**

This parameter is used to selectively disable or enable DTMF detection on line card ports. DTMF detection normally is enabled; it may be disabled to prevent callers on certain ports from logging into mailboxes, for example.

#25 Enable DTMF Col. 3

This line exception enables fourth column DTMF tones (A, B, C, and D). Default is disabled.

#32 DTMF receive debounce time

The DTMF receive debounce time specifies the amount of time a DTMF key must be depressed before it is recognized as a valid NuPoint Voice application command. This line exception is active except when playing or recording a message.

#33 Record DTMF receive debounce

The Record DTMF receive debounce time stipulates how long a DTMF key must be depressed during the recording of a message for the system to recognize the tone as DTMF. The value of this line exception is set higher than line exception 32, which means the DTMF key must be pressed slightly longer during the recording of messages than at other times. Since higher voices often have components that can be mistaken for DTMF tones, but these components are usually of short duration, this parameter can prevent false DTMF detection.

#34 Play DTMF receive debounce

This parameter determines how long a DTMF key must be depressed during the playing of a message for the system to recognize tone as DTMF input. Like the Record DTMF receive debounce time, the value of this line exception is set higher than line exception 32. This prevents the NuPoint Voice application from mistaking high voice frequencies for DTMF tones when messages are played.

GREET COMMAND PARAMETERS:**#8 Dead line timeout**

Dead line timeout sets the number of seconds the NuPoint Voice application waits for ringing, busy tone, or speech after issuing a greeting. Silence intervals greater than the dead line timeout value are interpreted as a dead line or disconnect.

#128 Minimum busy half cycle (greet)

When the greet command is active, the line card uses the minimum busy half cycle (greet), together with line exceptions #174 (minimum busy detection time) and #175 (maximum busy detection time) to determine if a signal it is receiving is a busy tone. This parameter also is used with parameters #172 (minimum reorder detection time) and #173 (maximum reorder detection time) to detect reorder tone while the greet command is active.

#10 Silence timeout**#11 Speak timeout****#146 Speech detect minimum time****#170 Speech detect minimum power (greet)**

The line card uses these parameters, together with a characteristic called absolute steadiness, to detect speech.

The speech or energy burst received by the line card must have a duration that falls between the values set by parameters #146 and #11, and

have at least as much energy as the value of parameter #170.

The speech or energy burst must be followed by a minimum amount of silence, as specified by parameter #10. (This is how the line card differentiates multiple bursts from a single long burst of energy or speech.)

If the signal received meets these criteria, the greet software measures the absolute steadiness, or the ratio of minimum energy to maximum energy of the signal, to differentiate between a call progress tone and speech. Call progress tones have steady energy throughout the speech detect interval; speech has extremely variable energy.

#182 Ringback tone maximum silence

This line exception specifies the maximum silence allowed between ringback tone cycles before a greet command terminates automatically with a speech detect event.

SPEECH AND SILENCE DETECTION DURING RECORDING:

#160 Silence delay

This is the maximum amount of silence, specified in frames, needed to detect a pause.

#161 Minimum miniframes not silent

This is the minimum number of miniframes used to reactivate recording after a pause is detected.

#162 Minimum speech frames

This is the minimum number of consecutive frames of speech (as determined by #163) required to set the recording timeout. The Minimum Speech Frames parameter prevents recording from stopping after it has started.

#163 Minimum miniframes speech

This is the minimum number of miniframes of speech needed to determine that an entire frame contains speech. This parameter also prevents recording from stopping after it has started.

PROMPT AND MESSAGE OUTPUT CONTROLS:

#4 Pause compression enable

NuPoint Voice application line cards normally compress intervals of silence, to eliminate pauses in speech before sending messages to the hard disk for storage. In addition to saving disk storage space, pause compression usually improves the quality of message playback. This feature may be disabled, if necessary.

#13 Enable AGC

Automatic Gain Control (AGC) adjusts weak and strong signals to keep the output level of speech constant. This means callers and system users do not hear wide variations in the loudness and softness of greetings, prompts, and messages played to them.

#178 Record prompt output level

This controls the amplitude of the “beep” that is issued before allowing the recording of a message or greeting. The record prompt also is affected by #156 Record prompt duration, which controls the length of the record prompt signal, and #158 Record prompt frequency, which specifies the frequency, in hertz, of the record prompt beep.

OTHER LINE EXCEPTIONS

#200 Background power lower limit

The default is 10. Background power noise levels below this limit are not recorded.

#214 DTMF detect minimum power ratio

The default is 16. Ratio of noise power just before DTMF to power during DTMF must be above this value before DTMF events are sent to the module while in record mode. This ratio adapts upward during recording if a high signal to noise ratio is found. The line exception value corresponds to internal power detectors, and thus is not directly related to dB.

APPENDIX III: Line Card Interfaces

The following line card interfaces are supported by the platform:

- Loop start—The loop start interface is with 4/8port loop start line cards.
- DID—The DID/E&M interface is provided with 4/8port loop DID line cards.
- 2wire E&M—This interface is provided with DID/E&M line cards. Both E&M Types I & V are supported.
- T1—The platform supports direct digital connections to T1 (North America) and, the T1 interfaces emulate loopstart, DID, and E&M protocols.
- A power/configuration card is required when analog DID/E&M or groundstart line interfaces are employed. This card provides 48V to the line interface circuits on these cards. One power/configuration card serves up to four 4/8port analog line cards.
- DSE—The Digital Set Emulation Card (DSE) provides the interface to the Lucent and Mitel PBX for In-Channel Integration. The DSE card is available in 8-port increments.
- DSP—The Digital Signal Protocol card (DSP) provide the voice processing (i.e. tone detection, voice compression/decompression, etc.) for In-Channel Integrations and T1 systems.

APPENDIX IV: Integration Matrix

MANUFACTURER	SWITCH	INTEGRATION TYPE		MINIMUM SOFTWARE LEVEL	SOFTWARE REQUIRED (UP TO 6.1)	SOFTWARE REQUIRED (7.0)
		VOICE WAITING	MESSAGE			
CommDial	Executech 2000/ Express/Impact	Inband Loop	DTMF to PBX/MMW		Base software	Base software
	22XX	Interface only	DTMF to PBX/MMW		Base software	Base software
David Systems	David Info. System	None	Data Link/ MW only	3.0	Centrex 1AESS	General Data Link
Digital Voice	DBX 1200/5000	Inband Loop	DTMF to PBX/MMW	5.0	Base software	Base software
Ericsson	BP 250	Inband Loop	DTMF to PBX/MMW		Base software	Base software
	MD 110 and Voice Bridge Box	Ericsson MD110	Data Link and Voice Bridge Box	5.02B	Ericsson MD110	General Data Link
	AXE 10 w/SMDI	Data Link Loop	Data Link	5.0	1AESS Centrex	General Data Link
	CMS8800 (Cellular) w/ or w/o DTMF	DID/Enhanced Inband DID	DTMF to PBX/MMW	4.0/5.02	DID-Base software Enhanced Inband general	DID-Base software Enhanced Inband general
Executone	E1000/E400	Inband Loop	DTMF to PBX/MMW	4.0	Base Software	Base Software
	IDS 228/432	Inband/Enhanced Inband Loop	DTMF to PBX/MMW	5.0/5.02	Base Software Enhanced Inband	Base Software Enhanced Inband
	ECX 3672	Inband Loop	None		Base software	Base software
Fujitsu	F9600	Data Link (SMDI) Loop T1	Data Link	3.0	Fujitsu 9600	Fujitsu 9600
	OMNI SI, SII, SIII (GTE)	Enhanced Inband-E&M	DTMF to PBX/MMW	5.02	Enhanced Inband - Omni	Enhanced Inband - Omni
	Series 3/Starlog II	Enhanced Inband Loop	DTMF to PBX/MMW	5.02	Enhanced Inband - Starlog	Enhanced Inband - Starlog
	E650	Enhanced Inband Loop	DTMF to PBX/MMW	5.02	Enhanced Inbandn - Starlog	Enhanced Inband - Starlog
	Fetex 620,640	Enhanced Inband Loop	DTMF to PBX/MMW	5.02	Enhanced Inband - Starlog	Enhanced Inband - Starlog
Goldstar	Aria 162	Enhanced Inband	DTMF to PBX/MM	5.02	LUCENT System 25	LUCENT System 25
GPT (Int'l)	System X	Enhanced Inband Loop			Enhanced Inband general	Enhanced Inband general
	ISGX / MCX/ISDX	Enhanced Inband Loop	DTMF to PBX/MMW	5.02	Enhanced Inband general	Enhanced Inband general
GTE	GTD-5	Enhanced Inband-E&M/T1	DTMF to PBX/MMW	5.02	Enhanced Inband general	Enhanced Inband general
	GTD-4600	Inband E&M	DTMF to PBX/MMW	5.02	Base software	Base software
Harris	20/20	Inband/ Enhanced E&M T1 E&M Only (Rel. 7.01.B.10+) Loop (Rel.. 7.01 B.10+)	DTMF to PBX/MMW	5.01/5.02	Inband - Base software Enhanced Inband general	Inband - Base software Enhanced Inband general
	D400/D1200	Inband Loop	DTMF to PBX/MMW	2.08	Base software	Base software

MANUFACTURER	SWITCH	INTEGRATION TYPE		MINIMUM SOFTWARE LEVEL	SOFTWARE REQUIRED (UP TO 6.1)	SOFTWARE REQUIRED (7.0)
		VOICE WAITING	MESSAGE			
Hitachi	DX (2.3 and later)	Inband Loop	Data Link	2.08	Hitachi DX	Hitachi DX.
	HCX 5000/5500 (6.0)	Inband Loop	Data Link	5.01	Hitachi HCX	Hitachi HCX
	HCX 5000/5500 (6.2)	Inband Loop	Data Link	5.02	Hitachi HCX	Hitachi HCX
Intecom	IBX S/10, S/40, S/80, "E"	Data Link (SMDI) Loop	Data Link	4.01	Intecom	Intecom
	Teleri	Data Link Loop	Data Link	4.01	Intecom	Intecom
Inter-Tel	Access	Inband Loop	DTMF to PBX/MMW	5.0	Base software	Base software
	Premier 2460 ESP/ESP DX	Inband Loop	DTMF to PBX/MMW	5.0	Base software	Base software
ISOETEC EZ1	228/96/66	Inband Loop	DTMF to PBX/MMW	4.0	Base software	Base software
	108	Inband	DTMF to PBX/MMW	4.0	Base software	Base software
	432	Enhanced Inband Loop				
	ECS Cortelco ECS 136	Enhanced Inband Loop	DTMF to PBX/MMW	5.0	Enhanced Inband general	Enhanced Inband general
Iwatsu	Omega IV ADIX	Enhanced Inband Loop	DTMF to PBX/MMW	5.02	Enhanced Inband general	Enhanced Inband general
	Omega ZT-D	Enhanced Inband Loop	DTMF to PBX/MMW	5.02	Enhanced Inband general	Enhanced Inband general
LUCENT	NPplex 1000	Inband E&M/T1	DTMF to PBX	5.0	Base software	Base Software
	NPplex 100	Inband E&M/T1	None	5.0	Base Software	Base Software
	System 25	Enhanced Inband Loop	DTMF to PBX/MMW	5.02	Enhanced Inband - Lucent Sys 25	Enhanced Inband - Lucent Sys 25
	Partner II	Enhanced Inband Loop	DTMF to PBX/MMW	5.02	Enhanced Inband general	Enhanced Inband general
	Legend Merlin Legend	Enhanced Inband Loop	DTMF to PBX/MMW	5.02	Enhanced Inband general	Enhanced Inband general
	System 75/85/Definity G1 or lower	Data Link (SMDI) Use VoiceBridge Loop	DTMF to PBX/ MMW/VB	5.03	General Data Link Voice Bridge	General Data Link and Voice Bridge
	System 85/Definity G2/G3	LUCENT In-Channel	DTMF to PBX/ MMW	5.03	LUCENT In-Channel	LUCENT In-Channel
	1AESS	Data Link (SMDI) Loop	Data Link	3.0	Centrex 1AESS	Centrex 1AESS
	5ESS	Data Link (SMDI) Loop	Data Link	3.0	Centrex 5ESS	Centrex 5ESS
Dimension	Interface only	Interface only		Base software	Base software	
Horizon	Interface only/ARII	DTMF to PBX/MMW	5.02	Base software	Base software	

MANUFACTURER	SWITCH	INTEGRATION TYPE		MINIMUM SOFTWARE LEVEL	SOFTWARE REQUIRED (UP TO 6.1)	SOFTWARE REQUIRED (7.0)
		VOICE WAITING	MESSAGE			
	Prelude	Interface only	None		Base software	Base software
	Partner/Partner Plus	Interface/AR only	None		Base software ARI	Base software ARII
	Spirit	Interface only	Interface only		Base software	Base software
Mitel	SX-50®	Inband Loop	DTMF to PBX/MMW	4.0	Base software	Enhanced Inband general
	SX-200 Digital (1004+)	Inband - ONS	DTMF to PBX/MMW	5.0	Base software	Base software
	SX-200 Digital (1005 MR11 +)	Enhanced Inband - ONS	DTMF to PBX/MMW	5.02	Enhanced Inband general	Enhanced Inband general
	SX-200 Light Lightware 16 1.1	DNIC (In-Channel) DSE	DNIC ports/MMW	6.1	Not Available	Mitel DNIC
	SX-200 Light Lightware 15 MR11	Enhanced Inband - ONS	DTMF to PBX/MMW	5.02	Enhanced Inband general	Enhanced Inband general
	SX-2000 (2003-2006)	Inband - ONS	DTMF to PBX/MMW	5.0	Base software	Base software
	SX-2000 (2007 MR2)	Enhanced Inband - E&M	DTMF to PBX/MMW	5.02	Enhanced Inband general	Enhanced Inband general
	SX-2000 (2007 MR2) SX2000 Lightware 28, or greater	DNIC (In-Channel) DSE	DNIC ports /MMW	6.1	Not Available	Mitel DNIC
Motorola	EMX 100, 100+, EMX 250, 500, 2500	Enhanced Inband. DID , T1,		5.02	Enhanced Inband general	Enhanced Inband general
NEC	1400	Inband Loop	DTMF to PBX/MMW	2.08/5.01	Base software	Base software
	2000 Revision H	Data Link Loop	Data Link	2.08	NEC 2400 No Changes	General Data Link Requires Template Changes
	2400 Release 1700	Data Link Loop T1 (2400 must support 24DLI T1 card)	Data Link	2.08	NEC 2400 No Changes	General Data Link Requires Template Changes
	Electra Mark II/ Electra Professional	Inband E&M	DTMF to PBX/MMW	2.08/5.01	Base software	Base software
	61E	Data Link (SMDI) Loop	Data Link	5.0	Centrex 1AESS	General Data Link
	61 Kai	Inband (Call forward all only!) E&M	None	5.0	Base software (E&M)	Base software (E&M)
Nitsuoko	384I	Enhanced Inband Loop	DTMF to PBX/MMW	5.02	Enhanced Inband general	Enhanced Inband general
	DS400	Enhanced Inband Loop	DTMF to PBX/MMW	5.02	Enhanced Inband general	Enhanced Inband Onyx
Northern Telecom	Norstar	Enhanced Inband Loop	DTMF to PBX/MMW	5.02	Enhanced Inband general	Enhanced Inband general

MANUFACTURER	SWITCH	INTEGRATION TYPE		MINIMUM SOFTWARE LEVEL	SOFTWARE REQUIRED (UP TO 6.1)	SOFTWARE REQUIRED (7.0)
		VOICE WAITING	MESSAGE			
	DMS-10	Data Link (SMDI) Loop	Data Link	4.01	Centrex DMS 100	Centrex DMS 100
	DMS-100/500	Data Link (SMDI) Loop – T1 with Peripheral Shelf	Data Link	4.01	Centrex DMS 100	Centrex DMS 100
	SL-1/ M1 Enhanced Meridian Rel. 19 and below	Call Pickup	Digital Phone	5.02B	SL-1 Enhanced Meridian	SL-1 Enhanced Meridian
	SL-1 M1 Rel. 21 or 23 only	Nortel In-Channel	In-Channel	7.0	Not Available	Nortel In-Channel
	SL-1/ M1 IVMS	Data Link	Data Link	2.08 (Not 6.0)	SL-1 IVMS	Not Available
	SL-1/M1 IVMS/MRO	Data Link	Data Link	2.08 (Not 6.0)	SL-1 IVMS-MRO	Not Available
	SL-100 (BCS 24 +)	Data Link (SMDI) Loop, T1	Data Link	4.0	Centrex DMS 100	Centrex DMS 100
	SL-100 (BCS 20-23)	Inband E&M	DTMF to PBX/MMW	4.0	Base software	Base software
	MTX (Cellular)	Data Link (SMDI)/ Enhanced Inband	None	5.02	Centrex 1AESS / Enhanced Inband general	General Data Link/Enhanced Inband General
Novatel	(Cellular)	Data Link	No MWI available			General Data Link
North Supply	Premier	Inband Loop	DTMF to PBX/MMW		Base software	Base software
Panasonic	DBS	Inband Loop	DTMF to PBX/MMW	3.0	Base software	Base software
Phillips	Sopho-S	Inband Loop	None	5.0	Base software	Base software
Rockwell	Spectrum - Rel. 1-4	Enhanced Inband Loop	DTMF to PBX/MMW	5.02	Enhanced Inband	Enhanced Inband
	Spectrum - Rel. 5	Data Link T1	Data Link	5.0	1AESS Centrex	General Data Link
ROLM	Redwood	Inband - E&M	DTMF to PBX/MMW	5.01	Base software	Base software
	CBX 8000+	Call Pickup Loop	Digital Phone	5.01	ROLM 8000/9000	ROLM 8000/9000
	CBX 9000+	Call Pickup Loop	Digital Phone	5.01	ROLM 8000/9000	ROLM 8000/9000
	CBX 9751+	Call Pickup Loop	Digital Phone	5.01	ROLM 8000/9000	ROLM 8000/9000
	CBX 9006	Call Pickup Loop	Digital Phone	5.04	ROLM 8000/9000	ROLM 8000/9000
	CBX 9006i	Call Pickup Loop DTMF/MMW	Max. 1 Digital Phone	6.0	ROLM 8000/9000	ROLM 8000/9000
	9200/ HCM-200	Inband	DTMF to PBX/MMW	5.0	Base software	Base software
	Hicom 300 Loop	Enhanced Inband	DTMF to PBX/MMW	5.02	Enhanced Inband general	Enhanced Inband general
Samsung	DCS/56-120	Enhanced Inband Loop	DTMF to PBX/MMW	5.02	Enhanced Inband	Enhanced Inband
Siemens	HCM-200	Inband Loop	DTMF to PBX/MMW	4.0/5.01	Base software	Base software

MANUFACTURER	SWITCH	INTEGRATION TYPE		MINIMUM SOFTWARE LEVEL	SOFTWARE REQUIRED (UP TO 6.1)	SOFTWARE REQUIRED (7.0)
		VOICE WAITING	MESSAGE			
	HCM-300	Enhanced Inband Loop	DTMF to PBX/MMW	5.02	Enhanced Inband general	Enhanced Inband general
	Saturn IIE	Inband Loop	DTMF to PBX/MMW	5.03	Base software	Base software
	Saturn III	Inband Loop	DTMF to PBX/MMW	5.03	Base software	Base software
	EWSD	Data Link (Centrex) Loop	Data Link	3.0	1AESS Centrex	General Data Link
	MCX	Inband Loop	DTMF to PBX/MMW	5.0	Base software	Base Software
	40/80	Inband Loop	DTMF to PBX	5.0	Base software	Base software
	192/232	Interface only/ARII			Base software/ARII	Base software/ARII
Startel	3700/2700/2800	Inband Loop	None		Base software	Base software
Solid State Systems	SR-224, SR-96, 1000 (below Rel. 4.2) SR-1000	Inband E&M Loop (SR-1000 Rel. 4.2 +)	DTMF to PBX/MMW	5.01	Base software	Base software
Shared Resources(SRX)	System One	Inband/ Enhanced Inband Loop	DTMF to PBX/MMW	3.0/5.02	Base software or Enhanced Inband general	Base software/ Enhanced Inband general
Siemens Stromberg-Carson	DCO Rel. 16.5/17	Inband/ Enhanced Inband E&M/T1	DTMF to PBX/MMW	4.0/5.02	Base software/ Enhanced Inband general	Base software/ Enhanced Inband general
	DCO Rel. 18 Loop	Data Link (SMDI)	Data Link	3.0	1AESS Centrex	General Data Link
	DBX 1200/5000	Inband E&M	DTMF to PBX/MMW	2.08	Base software	Base software
Tadiran	Coral I, II, III	Inband E&M/T1	DTMF to PBX/MMW	4.0	Base software	Base software
Telex/Memorex	DBX 1200/5000	Inband E&M	DTMF to PBX/MMW	5.02	Base software	Base software
Telenova	Lexar System 2000	Inband Loop	DTMF to PBX/MMW	4.0	Base software	Base software
Telrad	Symphony II/ 2464	Inband Loop	DTMF to PBX/MMW	5.02	Base software	Base software
	818, S60, 128, D400	Inband Loop	DTMF to PBX/MMW (See Integration Note)	5.0	Base software	Base software
TIE Communications	Mercury M1000/2000	Enhanced Inband Loop	DTMF to PBX/MMW	5.02	Enhanced Inband general	Enhanced Inband general
	ONYX	Enhanced Inband Loop	DTMF to PBX/MMW	5.02	Enhanced Inband Onyx	Enhanced Inband Onyx
Toshiba	DK 96	Inband Loop	DTMF to PBX/MMW	5.01	Base Software	Base Software
	DK 280 Rel. 1	Inband Loop	DTMF to PBX/MMW	5.03	Base software	Base software
	DK 280 Rel. 2+	Inband/SMDI Loop	DTMF to PBX/ Data Link	5.0	Base software/ Centrex 1AESS	Base software/ General Data Link

MANUFACTURER	SWITCH	INTEGRATION TYPE		MINIMUM SOFTWARE (UP TO 6.1)	SOFTWARE REQUIRED (7.0)	SOFTWARE REQUIRED
		VOICE WAITING	MESSAGE LEVEL			
	Perception II	Inband Loop	DTMF to PBX	4.0	Base software	Base software
Vodavi	Starplus	Inband Loop	DTMF to PBX/MMW	5.01	Base software	Base software
Walker	200D	Inband Loop	DTMF to PBX/MMW	5.0	Base software	Base software

Enriching Business Communications Through Innovation.

A global manufacturer of enterprise voice communications for over a quarter century, Mitel has become a leader in converged voice and data systems and solutions.

We have built on our core competency of reliable, real-time voice communications to offer a portfolio of advanced business solutions encompassing: voice, converged voice and data networking, remote access solutions, unified messaging, call center solutions and public network access solutions.

We are driven by our belief that our customers should not have to take risks in order to take advantage of innovative technologies and solutions. By delivering tangible business value and offering unsurpassed technology investment protection, we will reduce the risk of innovation.



Simply Communicating

1-800-MITEL-SX

MITEL CORPORATION
350 Legget Drive
Kanata, Ontario
K2K 2W7 Canada
(613) 592-2122

MITEL INC.
205 Van Buren Street
Suite 400
Herndon, VA
20170-5336 USA
(703) 318-7020

MITEL TELECOM LTD.
Mitel Business Park
Portskewett, Caldicot
NP26 5YR UK
+44 (0) 1291 430000



www.mitel.com/messaging

THIS DOCUMENT IS PROVIDED TO YOU FOR INFORMATIONAL PURPOSES ONLY. The information furnished in this document is believed by Mitel to be accurate as of the date of its publication, and is subject to change without notice. Mitel assumes no responsibility for any errors or omissions in this document and shall have no obligation to you as a result of having made this document available to you or based upon the information it contains.

M MITEL (design), SX-50, SX-100, SX-200, and SX-2000 are registered trademarks; Mitel Nupoint Messenger, NuPoint Voice, NuPoint Agent, and NuPoint Fax, are trademarks of Mitel. All other names and products herein are the trademarks of their respective companies. All other names and products herein are the trademarks of their respective companies.

© Copyright 1999, Mitel Corporation. All rights reserved. GD3035 Printed in Canada.

PN 9150-952-002-NA, Issue 2