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Meridian Mail
Network Message Service Administration Guide

Product release 12	Standard 1.0	January 1998

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Meridian Mail

Network Message Service Administration Guide

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This is the standard release 1.0 of the *Network Message Service Administration Guide*. This guide documents Network Message Service (NMS) for Release 12 base software.

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Procedures

About this document

This document details the administration procedures to be performed by the Meridian Mail system administrator in order to implement, configure and maintain Network Message Service (NMS) in Meridian Mail release 12.

This guide applies to all Meridian Mail hardware platforms which use NMS. This guide applies only to single-customer Meridian Mail systems, since NMS is not supported on multi–customer systems.

Network Message Service (NMS)

NMS allows a number of Meridian 1s to be serviced by a single Meridian Mail system.

NMS is not available for the Meridian Mail MSM platform or the Modular Option GP platform which connects to the DMS-10 or DMS-100 (or third-party switch such as NEC, AT&T or ROLM using VoiceBridge) using an SMDI link.

NMS is not compatible with the Meridian Mail Multi-Customer feature.

Related documents

Throughout this guide you may be asked to refer to any of the following documents:

Number	Title
555-7001-301	*Meridian Mail System Administration Guide* (M1) (You will have this document if your Meridian Mail system is connected to a Meridian 1 and you do not have the Multi-Customer feature.)
555-7001-241	*Meridian Mail Networking Planning Guide*

Number	Title
555-7001-242	*Meridian Mail AMIS Networking Installation and Administration Guide*
555-7001-244	*Meridian Mail Meridian Networking Installation and Administration Guide*
555-7001-245	*Meridian Mail Virtual Node AMIS Networking Installation and Administration Guide*
555-7001-246	*Meridian Mail Enterprise Networking Installation and Administration Guide*

Typographic conventions

The following conventions are used throughout this guide:

- *Softkeys* These are displayed on the various administration menus and screens and indicate which keyboard function keys carry out specific Meridian Mail tasks. These are referred to in the document by using the label of the softkey (as displayed in the given menu), delimited by square brackets (for example, [Exit], [OK to Delete]).

- *Keyboard keys* These are referred to by indicating the label of the key, delimited by angle brackets (for example, <1>, <2>, <Return>).

- *Text input* Where you are required to input specific text, the characters are presented in bold print (for example, **abcd**, as opposed to <a><b><c><d>).

- *Fields in a menu* When the name of a field is referred to, it is in italics and in a different typeface than the body of the document (for example, *Last Name*, *Invalid Logon Attempts*).

- *Values in Fields* Where a field displays a set of values from which you must select, these values are in quotes (for example, "Yes", "No", "Enable", "Disable").

- *Spoken words* Where you are required to speak into the telephone, such as in the recording of greetings and announcements, any suggested words appear in quoted italics (for example, Say *"Please wait on the line, an attendant will be with you shortly."*).

- *Menus* Meridian Mail administration menus display a list of options or items from which you can make a selection.

• *Screens* Meridian Mail administration screens contain fields in which you can enter information or make a choice between two or more options such as Enabled and Disabled or Yes and No. They may also contain read-only fields.

References

In this manual, where reference is made to another part of the manual, or to another document, the following conventions are used:

• A reference to text in the same chapter appears surrounded by double quotation marks, giving the heading under which the required text is found (for example, see "Voice recordings" in this chapter).

• A reference to text in another section appears with double quotation marks, giving the name of the chapter and, where necessary, the heading under which the required text is found (for example, see "Voice recordings" in the "User administration" chapter).

• A reference to text in another manual appears in italics, giving the title of the manual in which the required text is found (for example, see *Meridian Mail Installation Procedures*).

Chapter 1: Overview

Introduction

Network Message Service (NMS) uses the signaling capabilities inherent in ISDN primary rate access (ISDN PRA) and ISDN signaling link (ISL) to provide customers with messaging services on a network rather than on a strictly local basis. Customers whose networks employ ISDN PRA or ISL will be able to extend the existing messaging services to any and all users served by that customer's network. Access to the Network Message Service, as well as feature activation from the messaging system, will be transparent to the end user.

Network Message Service comprises two distinct applications: Network Message Service-Message Center (NMS-MC) and Network Message Service-Meridian Mail (NMS-MM). NMS-MC, which supports manual message centers such as attendant console and ACD sets, was developed in Xl1 Release l5. NMS-MM enhances the Network Message Service-Message Center capability by providing the end user with transparent access to Meridian Mail across the network in Xll Release 16.

The objective of NMS-MM is to provide a centralized Meridian Mail system for all switches on the customer's ISDN PRA/ISL network.

> *Note:* In this context, an ISDN network is a network containing a number of Meridian 1 switches served by a single Meridian Mail server.

With this capability, customers can increase the value of their investment in Meridian Mail services by applying spare capacity to more end users. End users at locations previously considered too small for dedicated messaging support will now gain access to these messaging services, better integrating these users into the corporation's communications network.

Terminology

Before proceeding with a description of the Network Message Service, it is important to make the terms that will be used throughout this chapter clear at the outset.

The *prime switch* is the Meridian 1 to which the Meridian Mail server (with the NMS feature installed) is connected.

A *satellite switch* is any Meridian 1 in the NMS network other than the prime switch. In other words, it is a Meridian 1 that is not connected to its own Meridian Mail server, but rather is serviced by the prime switch.

A *location* is the group of mailbox numbers associated with a single switch. In some CDP configurations, it is possible for a location to represent users on more than one switch.

The *prime location* is the location representing the prime switch. Users that reside on the prime switch are added to the prime location.

A *satellite location* represents one of the satellite switches. Users that reside on a satellite switch are added to the corresponding satellite location.

A *site* refers to a Meridian Mail server and all of the switches that it supports.

The *local site* refers to all of the locations served by the Meridian Mail server.

Network format indicates that any necessary location codes, such as a CDP steering code or ESN prefixes, must be included when entering a user's address or a VSDN. In the case of ESN, the prefixes include the access code of the *prime* switch and the routing prefix of the satellite location.

General description
System composition

A Network Message Service (NMS)—Meridian Mail network consists of four components:

- ISDN network

- ISDN network transaction signaling (TS)

- AML/DIAL (ISDN/AP) application protocol

- Meridian Mail server

The following sections address each component respectively.

ISDN network

In an lSDN network, a single Meridian Mail (MM) server is attached to a Meridian 1 (the prime switch) to support a number of satellite Meridian switches. These Meridian 1s are interconnected by ISDN PRA or ISL trunks on which the network-wide call information is transported.

NMS-MM network definitions and requirements

In an NMS environment, user stations no longer have to reside in the Meridian Mail's prime switch. A a result, there can be four network switches involved in a NMS-MM call in the ISDN network. The four types of switches are as follows:

- *Originating switch* For a direct NMS-MM call, this is the switch where the calling party resides. For an indirect NMS-MM call, the originating switch is where the original called party resides.

- *Tandem switch* This is the switch that tandems the NMS-MM transaction signaling messages to the next switch.

- *Prime switch* This is the switch to which the NMS-MM server is physically connected.

- *Satellite switch* This is a switch that is networked to the prime switch by ISDN/PRA or ISDN/ISL.

Throughout this document these definitions for originating, tandem and prime switches (nodes) are used as well as a satellite switch (node) defined as any switch other than the prime switch.

NMS network numbering plans

NMS-MM supports the following private numbering plans:

- Uniform dialing plan (UDP)—for example, ESN or hybrid (ESN and CDP)

    An NMS-MM UDP numbering plan requires that all of the switches in the network conform *uniformly.* This means that all users must be dialed in the same way (that is, using the same DN) from all locations.

- Coordinated dialing plan (CDP)

The following are not supported by NMS-MM numbering plans:

- Mixed numbering plans and tandem tie networks using trunk access codes

- CDP transferable DNs

- Trunk steering codes

- Digit manipulation (DMI) to insert ESN access code ESN dialing in the sending switch. Instead, ESN access code insertion is provisioned in the receiving switch in overlay 16 with the INAC option.

In the NMS network environment, only distance steering codes (DSC) are supported for the CDP network numbering plan.

Public networks versus private networks

A *private network* refers to the privately owned switches that make up a corporation's or organization's network. An NMS network is a private network. A *public network* refers to the switches (operated by a central office) which provide services to the general public (such as residences and small businesses who do not own a switch).

Any call that comes from outside the private network is tagged with a public information element (PIE) and is considered an external call even though it has entered into the private network. These calls are treated as external calls by the Meridian Mail server unless they have been specifically identified as valid NMS calls by Meridian Mail.

ISDN network transaction signaling

In an NMS-MM environment, the prime switch and satellite switches communicate through virtual signaling to turn on/off the message waiting indication (MWI) at a user set or to transport necessary call information for a networked voice messaging feature such as Call Sender. These capabilities are supported by using ISDN non-call associated transaction signaling messages. In the Meridian 1, networking applications that require the transportation of virtual signaling information use the FACILITY message with the TCAP protocol to transport this information across the ISDN network.

AML application protocol

Communication between Meridian Mail and the prime switch uses the AML (ISDN/AP) serial data link protocol. The AML is labeled DIAL on the Option 11.

Meridian Mail server

The Merdian Mail server is an automated voice messaging processor that provides users with the ability to receive and send voice messages.

Figure 1-1 illustrates an example of an NMS-MM network configuration.

Figure 1-1
NMS-MM network
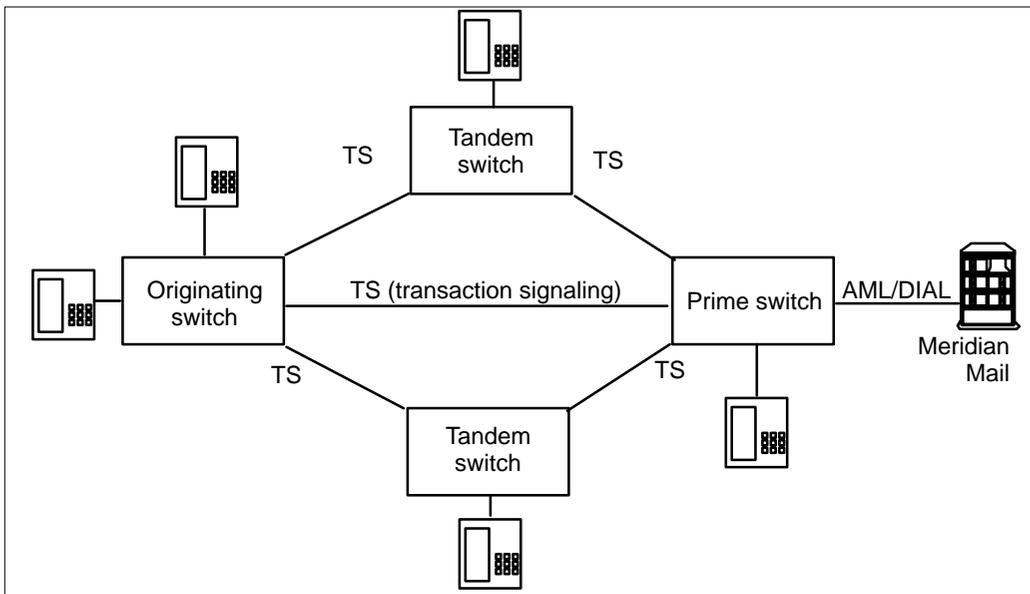
Requirements

This section addresses the requirements for Network Message Service—Meridian Mail provided in Meridian 1 Xll generic, Release 16. The requirements can be categorized as follows:

Configuration support

In Meridian 1 Xll generic Release 16, Network Message Service-Meridian Mail only supports end-to-end connections among Meridian 1 switches. These include point-to-point Meridian 1 to Meridian 1 connections as well as tandem Meridian 1 connections.

NMS-MM access

To access the NMS-MM services, the following three types of accessing mechanism are supported across the ISDN network:

Direct access

Direct access is initiated by a user dialing an NMS-MM DN, either on a per switch or a network basis, or by depressing the message waiting key (MWK) on the user's set to access the Meridian Mail system. Auto-logon to the NMS-MM is supported if the call is initiated from the respective user's station.

This functionality mirrors MM operations on non-NMS systems.

For a direct NMS-MM call initiated by user A, the call can be presented to Meridian Mail at the prime switch through direct Meridian 1 to Meridian 1 connection or tandeming through Meridian 1, DMS100/250, Meridian 100 or AT&T. This is a basic ISDN call which only requires call-associated ISDN Q.931 messages. However, in order to support NMS-MM which requires transaction signaling to transport the non-call associated information such as MWl notification, and the Call Sender feature, the network configuration between the originating and prime switches requires the support of transporting NMS-MM transaction signaling. If the path used to transport the non-call associated messages tandems through a switch that does not support NMS transaction signaling, NMS cannot be supported. (The path tandem through AT&T, DMS and SL-100 cannot be supported.) Demonstration of the direct NMS-MM call scenario in an ISDN network is depicted in Figure 1-2.

Figure 1-2
Direct NMS-MM access scenario
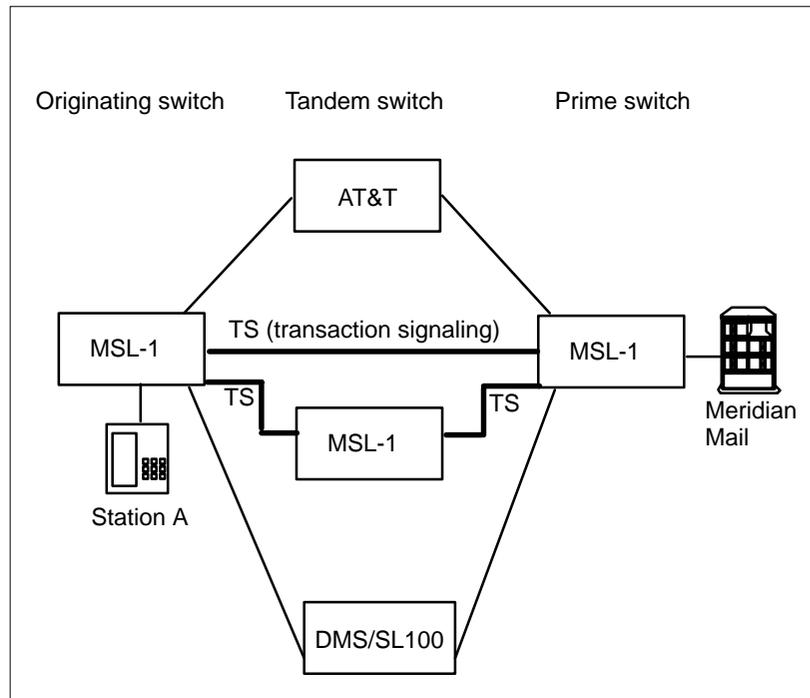
Indirect access

Indirect access occurs when a call is presented to the NMS-MM through call redirection. For any call redirected to NMS-MM, once a call has been forwarded to the prime switch to which Meridian Mail is physically connected, the original called number from the ISDN Q.931 SETUP message will be extracted and passed on to the Meridian Mail server. This convention will allow the MM server to distinguish the address of the original called party. Meridian Mail then can deposit the message in the original called party's mailbox. For a redirected network call, NMS relies upon the Network Call Redirection (NCRD) features developed in Release 14 and 16 to provide the correct original called number. The types of Network Call Redirection supported in Release 16 are as follows:

- Network call forward all calls (NCFAC)

- Network call forward no answer (NCFNA)

- Network call forward busy (NCFB)

- Network hunting (NHUNT)

For an indirect NMS-MM call, user A calls user B and B redirects the call to Meridian Mail by using ISDN Network call redirection features. These features do not support tandem through AT&T switches, therefore, the call can only be presented to Meridian Mail as shown in the following diagram. The requirement for NMS transaction signaling message is the same as direct NMS-MM call as previously mentioned. Figure 1-3 depicts an indirect NMS-MM call scenario.

Figure 1-3
Indirect NMS-MM access scenario
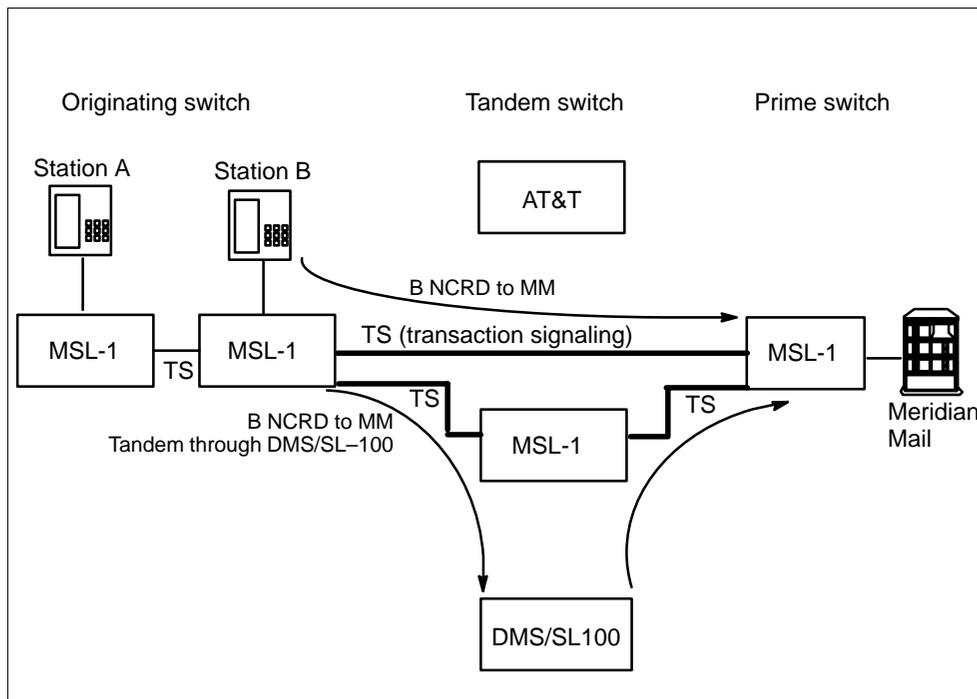
Offnet access

NMS-MM will support off-net access through either of the following scenarios:

- Directly dialing into the switch where the user's Meridian Mail server physically resides

- Dialing into the user's own switch to access a remote Meridian Mail server
  Note that this scenario may require the user's switch to support direct inward system access (DISA) or direct inward dialing (DID) to allow the user to dial another network location once he or she has dialed into his or her own switch.

MWI notification

At a user station, two types of message waiting indication exist:

- Visual indication through an LED or LCD lamp on the set

- Audible indication for sets not equipped with LED or LCD lamp

NMS-MM will notify a user (regardless of his or her location) that one or more messages have been received. Notification is by means of a flashing message waiting (MWK) LED or LCD lamp or (for a set without MWK support) an audible tone once the handset has been lifted. NMS-MM is capable of turning on or off MWK or the audio tone according to whether or not there are messages waiting.

Implementation considerations

The following assumptions are made:

1   The implementation of NMS-MM is built upon Meridian 1 Release 15
    ISDN PRA capability. Therefore it is subject to the assumptions and
    limitations of the ISDN Network Numbering Plan Enhancement
    feature in Release 15.

2   The user network is assumed to be equipped with either a uniform
    dialing plan (UDP) or a coordinated dialing plan (CDP) as the network
    numbering plan.

3   NMS-MM accessing is based on the Network Call Redirection
    (NCRD) features and is, therefore, subject to the assumptions and
    limitations of NCRD features.

4   Every station's CDP DN in the network is assumed to be uniquely
    defined.

5   The local Meridian Mail DN defined in each switch must also be
    configured in the Meridian Mail server database.

6   Trunk optimization, which drops excessive trunks in order to avoid
    "tromboning" (extending trunks out from and back to the same
    switch), is not supported.

Engineering guidelines

Packaging

The packaging requirement for the Meridian 1 is described below:

Originating switch

- NMS package/option 175

- AML/CSL (ISDN/AP) package/option 77

- BACD package 40

- ACDA package 45

The following are the prerequisite packages required in this switch:

- ISDN network service package 148 for supporting the backbone ISDN
  capabilities. (Note that package 148 has its own prerequisite package
  requirements that need to be fulfilled.)

- Current message center MWC package 46.

- End-to-end signaling EES package/option 10.

 Release 16 or up software load is required.

Tandem switch

- ISDN network service package/option 148 as prerequisite

- Release 16 or greater software is required.

Prime switch

- NMS package/option 175

- IMS package 35

- AML/CSL (ISDN/AP) package/option 77

- BACD package 40

- ACDA package 45

The following are the prerequisite packages required in this switch:

- ISDN network service package/option 148

- MWC package 46

- EES package/option 10

Release 16 or greater software is required.

AUX processors and servers

Meridian Mail equipped with MM7 or greater software release is required to connect to a Meridian 1 switch.

Network configuration requirements

In order to support the basic functionality of NMS-Meridian Mail such as MWI notification, Call Sender service, and so on, the network configuration between the satellite and prime switches requires the support of transporting NMS-MM non-call associated transaction signaling. Currently, NMS-MM only supports connections among Meridian 1 switches. It is recommended that this route choice be configured as the initial route choice. D channels with an interface other than SL-1 will not be allowed to transport the transaction signaling for NMS-MM.

Limitations

1   End-to-end in-band signaling (EES) is required for accessing NMS-MM features from a satellite switch.

2   If a non-PRA/ISL trunk is involved in a NMS-MM call, NMS-MM will not be supported since the original called number and calling party number are not passed on.

3   NMS-MM does not support international dialing in Release 16.

4   Any MM feature involving a call establishment to an off-net location, including a public network, is not supported in this release. Therefore, Call Sender and Thru-Dial to the off-net will not be supported in this release.

5   NMS-MM will support DMS and SL-100 as tandem switches only when TCAP/ PRA networking for NMS-MM is available on DMS and SL-100.

6   NMS-MM cannot support any non-Nortel switch such as an AT&T switch as a tandem switch.

7   Only distance steering codes (DSC) are supported for the CDP dialing plan in an ISDN network.

8   Trunk steering codes (TSCs) are not supported.

9   Multiple message center types per station are not supported in this release. Therefore, only a single message center DN can be defined per station.

10 The Network Call Redirection DN and ACD night call forward DN defined for the Meridian Mail network DN must be compatible with the network numbering plans.

11 Only Meridian Mail servers are supported. No other voice messaging server is supported.

12 Do not use digit manipulation (DMI) to insert ESN access codes ESN dialing in the sending switch. ESN access code insertion is provisioned in the receiving switch in overlay 16 with the INAC option.

Dependencies

This feature is dependent on the Network Call Forward No Answer feature and Network Call Redirection to correctly transport the original called number.

This feature depends upon the Meridian 1 Hospitality Voice Services feature to provide AML/DIAL link recovery enhancement capability.

Feature interactions

This section describes the existing Meridian 1 features that interact with Network Message Service-Meridian Mail.

Set Types Addressed

This feature does not support data sets, but the following voice sets are supported:

- 500/2500 sets

- SL-1 sets

- Digital sets: 2009, 2018, 2112, 2317, 2112C, 2012, 3000

- Meridian modular telephone sets: 2008, 2016, 2006, 2X16, 2216 5. Attendant set (QCW4, M1250, M2250)

ISDN Network Call Redirection

The interaction with ISDN NCRD is broken down into the following areas:

Call Forward Unconditional, Call Forward No Answer, and Call Forward Busy

Call Forward Unconditional, Call Forward No Answer and Call Forward Busy are supported by Release 14 and 16 ISDN Network Call Redirection features. These provide the base for NMS indirect access. In the case of an indirect NMS access call, the original called number and redirecting reason will be extracted from the original called number information element (IE)

in the PRA SETUP message and put into the AML/DIAL PCI message when presenting a call to the Meridian Mail server. If original called number IE is not present, the redirecting IE will be used instead. Similarly, the redirecting number and reason will be extracted and transported to Meridian Mail server through a PCI message.

Network Call Transfer

Network Call Transfer is supported in release 16 by the ISDN Network Call Redirection feature. If the NMS-MM is involved in a Network Call Transfer call scenario, the connected party number will be extracted from the PRA NOTIFY message and put into the AML/DIAL DNP message once the transfer is completed. The DN update message is to inform Meridian Mail that a call transfer has taken place.

Network Hunting

Network Hunting is supported in release 16 by the ISDN Network Call Redirection II feature. Indirect NMS access can be presented to Meridian Mail through network hunting. The messaging is the same as the one for Call Forward Busy. Therefore, the original called number IE in the PRA SETUP message will be used to construct the ISDN/AP PCI message.

Call Forward by Call Type to a Network DN

The definition of the Call Forward by Call Type Allowed (CFTA) class of service is changed by the ISDN Network Call Redirection feature developed in Release 16, such that private network calls are treated as internal calls and will be forwarded (through the Call Forward No Answer or Hunting) to the Flexible Directory Number (FDN) or HUNT DN rather than the External Flexible Directory Number (EFD) or External Hunt (EHT) DN. This feature is implemented in release 16 by the ISDN Network Call Redirection feature. With this feature, the Meridian 1 will be able to provide different messaging treatments for different types of calls, such as off-net versus on-net calls. A customer could designate that all off-net calls be handled by a centralized attendant, while internal calls might be handled by Meridian Mail. You are however, limited to having one message center DN defined per station. This means a user can be served by two message centers (one for internal, one for external) but only one can control MWI activation.

Attendant Extended Call

Attendant extended call has a similar impact as network call transfer except that the DN update message is sent to Meridian Mail when the attendant releases from the call. Therefore, the connected party number is updated only when the attendant is released.

Call from CO loop start

The existing restriction is that calls coming into the switch from the CO loop start trunk cannot be redirected to another trunk through attendant extension or call redirection. These calls should be blocked when redirection is activated. Release 14 ISDN NCRD does not redirect calls from CO loop start. Therefore, NMS will not be supported in these calls.

Conference Call

When another party is conferenced to Meridian Mail, a DN update message will be sent indicating a call type of conference. The connected party DN will be that of the station initiating the conference call which will always be the same as the DN in the PCI message. If additional parties are added to the conference, no additional DNP messages need to be sent. Once a conference call drops back to a simple call, a DNP message will be sent indicating a simple call as call type and showing the remaining party as the connected DN. In both cases where the conference is established or dropped in a satellite switch, a FACILITY message with TCAP protocol will be transported to notify the prime switch of the events that have occurred. The DNP message will then be triggered and sent to the Meridian Mail server.

Barge-in Attendant feature

The attendant can barge-in a NMS-MM call at the prime switch. During barge-in, users cannot use features that require switch effort, such as Call Sender.

Tandem Switching

In order to support NMS-MM, the tandem switch needs to support NMS transaction signaling messages, and FACILITY message with TCAP protocol.

Trunks

When a call is presented to Meridian Mail through a non-PRA or ISL trunk, the call will be treated as an external call even if it is an on-net call. The external greeting will be applied. The message is announced as if from an external number.

Digital Sets with Feature Softkeys

Currently, a screen containing voice messaging feature softkeys (for example M2317 set) or command soft-window (for example M3000 set) are displayed when the Meridian Mail server is accessed from these digital sets. In the network environment this operation should be transparent to the end user at a satellite switch as well. Therefore, a FACILITY message with TCAP protocol will be transmitted to the satellite switch to indicate that Meridian Mail has been accessed.

Meridian Hospitality Voice Services

This feature depends on the AML/DIAL (ISDN/AP) link recovery enhancement of the Meridian Hospitality Voice Services feature to provide the AML/DIAL link recovery treatment. All calls to the Meridian Mail server will be redirected to the ACD Night Call Forward DN for the ACD queue involved. The treatment of calls will be identical to that of existing Night Call Forward operation for ACD queues.

Network Numbering Plan Enhancement

The NMS-MM networking feature is built upon Release 15 ISDN PRA capabilities. Therefore, it is subject to the limitations and assumptions of the ISDN Network Numbering Plan Enhancement feature developed in Release 15 which was to remove the ISDN numbering plan restrictions on the networking applications.

Network Message Service-Message Center

This feature makes use of the NMS-MC message waiting indication capability to turn on/off the MWI in satellite switches.

Identifying how your network is set up

Before you configure NMS, you should have a clear picture of what your network looks like. It is recommended that you create a diagram which represents your network configuration. The following is an example of a network configuration diagram

Figure 1-4
Sample of a network diagram
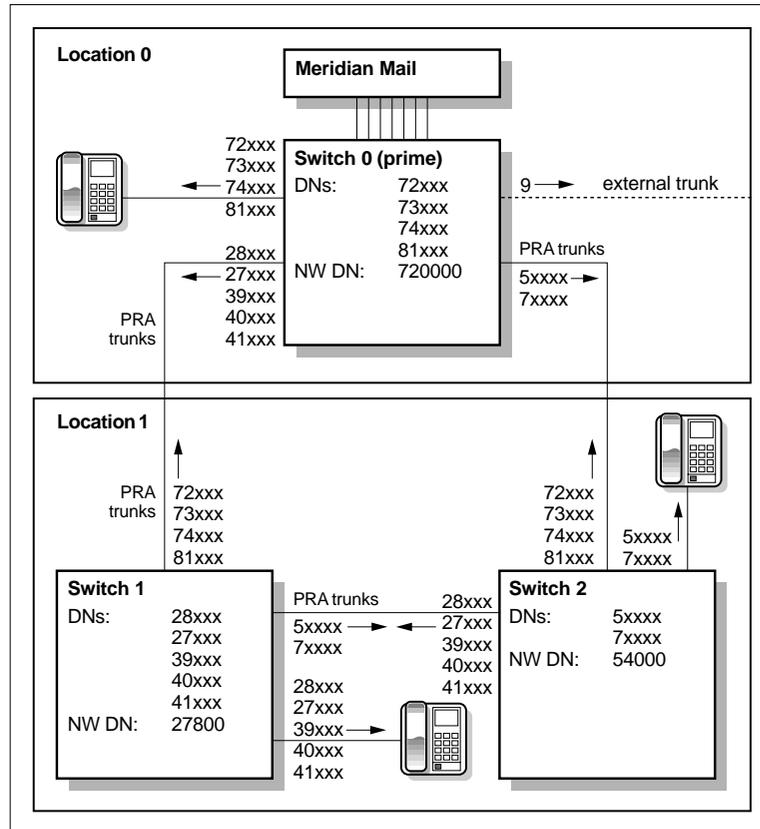
G100322A

To create a diagram of your network configuration, follow these steps:

1   Identify the dialing plan for each switch.

2   Identify the location codes for each switch.

3   Identify how the switches in your network will be represented by NMS
    locations.

For ESN networks

If all switches are part of an ESN network, there must be a one-to-one
correspondence between the number of switches and number of
locations. You can define up to 10 ESN prefixes for each location that
belongs to an ESN network.

For CDP networks
Defining one location for each switch

Normally you would represent each switch with an NMS location, ensure that there are no conflicts (that is, make sure that the same extension does not exist in two different switches). If you create one large location to represent all switches, you do not have to worry about such conflicts.

Defining one location for all switches

If there are less than 50 steering codes representing the entire network, you can consider creating one NMS location to represent all of the switches using CDP in the NMS network. This is advantageous for the following reasons:

— There is less programming involved.

— You do not have to change the administration context when adding, viewing, modifying or deleting users, thus saving time and reducing the risk of making a mistake.

— You do not have to configure ACD queues for services at all locations. You need only create a voice messaging queue once (as well as one dummy queue for each additional voice service that is needed) on the prime switch.

Note 1: This configuration requires that you use CDP to redirect calls from satellite switches to the prime switch.

Note 2: If, by combining all switches into one large location, you end up with more than 50 steering codes, you will either have to create satellite locations to represent all steering codes, or modify your network (so that certain steering codes are no longer used). This is because each NMS location supports a maximum of 50 steering codes. Other limitations are described in the section "Coordinated dialing plan (CDP)" on page 1-27.

For Hybrid (ESN and CDP) networks

If both an ESN and CDP dialing plan are implemented in your network, all switches must support ESN (that is, they must have ESN prefixes). Not all switches have to support CDP. However, the prime switch must support both numbering plans.

If all CDP switches share the same ESN prefixes, configure the prime switch to represent all of the switches that are part of the CDP.

If each CDP switch has its own ESN prefix, create a prime location and a satellite location for each ESN prefix in the network.

4   Identify the voice services that are required (at each location).

Use the forms in the following section to collect all of the information that you will need to successfully configure each location in your network.

Collecting information about your network

Use the first form to collect information about the prime location. Use the second form to collect information about each each satellite location in your network.

Prime Location   Page 1 of 2

Location number: _____

Location name: _____

Dialing plan (circle one):   ESN   CDP   Hybrid

Maximum number of digits in local mailbox: _____
_____

If an ESN dialing plan is used:

ESN access codes: _____   _____

Number of overlapping digits between ESN prefix and local ext.: _____

ESN prefixes: _____ _____ _____ _____ _____
(include 1st access code)   _____ _____ _____ _____ _____

_____

If a CDP dialing plan is used:

Number of overlapping digits between CDP steering code and local ext.: _____

CDP steering codes: _____ _____ _____ _____ _____ _____

                                      _____ _____ _____ _____ _____ _____

                                      _____ _____ _____ _____ _____ _____

                                      _____ _____ _____ _____ _____ _____

                                      _____ _____ _____ _____ _____ _____

                                      _____ _____ _____ _____ _____ _____

                                      _____ _____ _____ _____ _____ _____

                                      _____ _____ _____ _____ _____ _____

                                      _____ _____ _____ _____ _____ _____

                                      _____ _____ _____ _____ _____ _____

Prime Location Page 2 of 2

If a Hybrid dialing plan is used:

ESN access codes: _____   _____

Number of overlapping digits between ESN prefix and local ext.: _____

ESN prefixes: _____ _____ _____ _____ _____

(include 1st access code)   _____ _____ _____ _____ _____

Number of overlapping digits between CDP steering code and local ext.: _____

CDP steering codes: _____ _____ _____ _____ _____

                             _____ _____ _____ _____ _____

                             _____ _____ _____ _____ _____

                             _____ _____ _____ _____ _____

                             _____ _____ _____ _____ _____

                             _____ _____ _____ _____ _____

                             _____ _____ _____ _____ _____

                             _____ _____ _____ _____ _____

                             _____ _____ _____ _____ _____

                             _____ _____ _____ _____ _____

                             _____ _____ _____ _____ _____

Satellite Location   Page 1 of 2

Location number: _____

Location name: _____

Dialing plan (circle one):   ESN   CDP   Hybrid*

Maximum number of digits in local mailbox: _____
_____

If an ESN dialing plan is used:

ESN access codes: _____   _____

Number of overlapping digits between ESN prefix and local ext.: _____

ESN Prefixes: _____ _____ _____ _____ _____

                              _____ _____ _____ _____ _____

(ESN prefix must begin with 1st access code of prime location)

_____

If a CDP dialing plan is used:

Number of overlapping digits between CDP steering code and local ext.: _____

CDP steering codes: _____ _____ _____ _____ _____ _____

                           _____ _____ _____ _____ _____ _____

                           _____ _____ _____ _____ _____ _____

                           _____ _____ _____ _____ _____ _____

                           _____ _____ _____ _____ _____ _____

                           _____ _____ _____ _____ _____ _____

                           _____ _____ _____ _____ _____ _____

                           _____ _____ _____ _____ _____ _____

                           _____ _____ _____ _____ _____ _____

                           _____ _____ _____ _____ _____ _____

*If Prime is ESN or Hybrid, Satellite cannot be CDP. If Prime is CDP, Satellite cannot be ESN or Hybrid

---

Satellite Location   Page 2 of 2

If a Hybrid dialing plan is used:

ESN access codes: _____   _____

Number of overlapping digits between ESN prefix and local ext.: _____

Number of overlapping digits between CDP steering code and local ext.: _____

ESN prefixes: _____ _____ _____ _____ _____

                           _____ _____ _____ _____ _____

(ESN prefix must begin with 1st access code of prime location)

CDP steering codes: _____ _____ _____ _____ _____

                           _____ _____ _____ _____ _____

                           _____ _____ _____ _____ _____

                           _____ _____ _____ _____ _____

                           _____ _____ _____ _____ _____

                           _____ _____ _____ _____ _____

                           _____ _____ _____ _____ _____

                           _____ _____ _____ _____ _____

                           _____ _____ _____ _____ _____

                           _____ _____ _____ _____ _____

Dialing plans and location codes

A *dialing plan* is the set of rules the network uses to route calls through the private phone network.

A location code is a unique identifier that indicates a particular location within a network. This is a generic term. In a CDP (coordinated dialing plan) network the *CDP steering code* is the location code. In an ESN network, this is the *ESN prefix*. These location codes are required when a local user composes and sends a message to a user at a satellite location. (These codes are typically the same as the dialing codes used to call the user at the remote satellite location.)

A CDP network is transparent to users because the CDP steering code is part of the local mailbox number. This means that the dialing codes of users at other locations look the same (that is, are of the same length) as those of local users. In an ESN network, the prefixes are not part of the local mailbox number but must be prepended when dialing a user at another location. Therefore when a user composes a message to a user at another location, the address will be longer than when he or she composes a message to a local user. See the following sections on CDP and ESN dialing plans for more information and examples.

In an ESN network, a location can have up to 10 ESN prefixes associated with it. In a CDP network, a location can have up to 50 steering codes.

> *Note:* Verify that no other prefixes in the system conflicts with the location codes. If there is a conflict, you will have to change the prefix or the location code.

ESN dialing plan (electronic switched network)

In an ESN (electronic switched network) dialing plan, each location has an access code and up to 10 location codes. When a user places a call to a user at another location, he or she must first dial one of these prefixes before dialing the user's extension DN. All users in the NMS network use the same prefix to reach a user at a particular location. When a user calls another local user (on the same switch), he or she simply dials the local extension without any prefixes.

An ESN prefix consists of two elements: an *access code,* one to three digits in length, followed by a *routing prefix* of a fixed length (usually three digits). (Meridian Mail does not require that ESN prefixes be a fixed length, and the length may vary from prefix to prefix.)

The ESN access code is used to access ESN routing in the same way that an access code (usually 9) is needed to dial out of the switch. The same access code is typically used by all switches in a network, although it may vary from switch to switch. (ESN access codes are similar to trunk access codes and are set independently in each switch.)

The routing prefix is a unique number which identifies a particular location within the network. It is usually three digits in length. These two elements together (the access code and the routing prefix) make up the ESN prefix. The ESN prefix can be up to ten digits in length.

For example, a user at Location 0 has the local extension 3000. All users at Location 0 can reach this user by dialing 3000. A user at Location 1 has to dial an ESN prefix followed by the extension DN. If an ESN prefix for Location 0 is 6655 (the 6 is the access code and the routing prefix is 655), users at other locations must dial 66553000. This means that a particular extension DN may be repeated in locations having different ESN prefixes. For example, 66553000 and 66443000 have the same local extension DN (3000), yet are unique within the network because of the different ESN prefixes.

> *Note:* Two users in the same location are not allowed to have the same extension.

To expand the range of DNs that are available, you can overlap the leading digits of the local extension with the trailing digits of the ESN prefix. Using the full DN 6644000 as an example, 4000 is the local extension DN and the full ESN prefix (the access code plus the routing prefix) is 6644. Here, the 4 is both the last digit in the ESN prefix and the first digit of the local

extension. If overlap were not allowed, local extensions in the range of 4000 to 4999 would not be possible.

The location codes you configure in the NMS administration screens must emulate the existing dialing plan. For example, in an ESN network, local users dial 6644xxxx (where xxxx is the local mailbox number) to call users at Location 1. You would therefore enter 6644 as the ESN prefix.

Figure 1-5
An ESN network with two Meridian 1/SL-1s
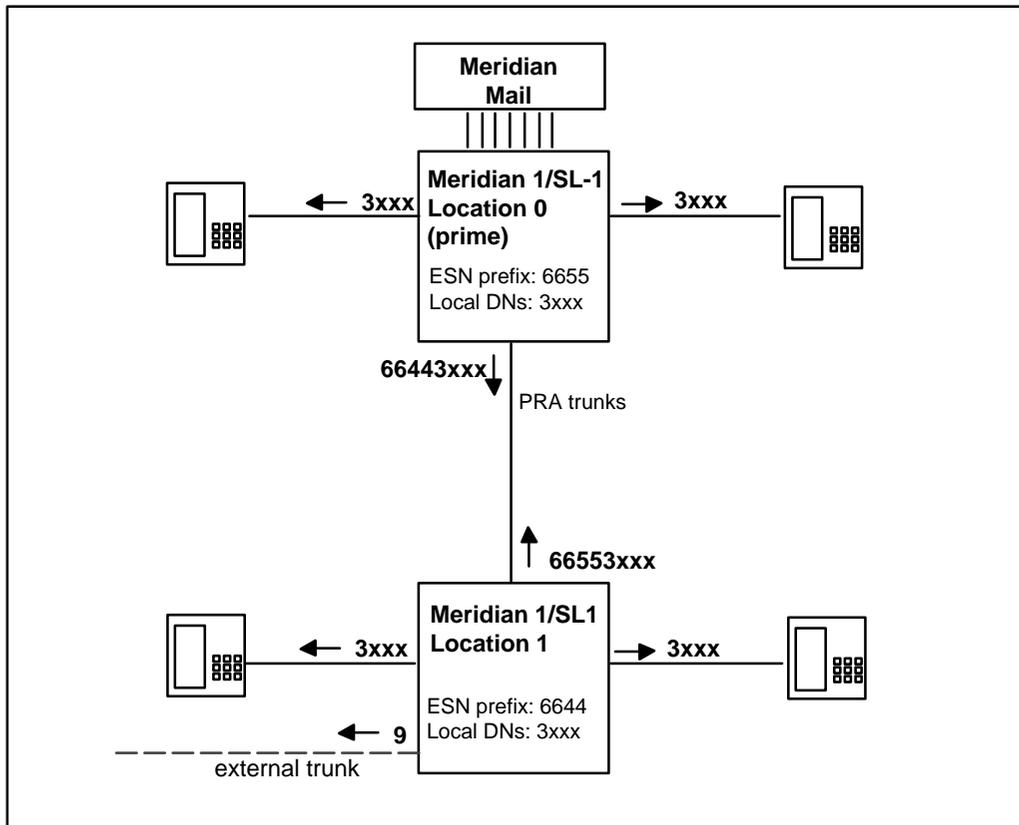
Coordinated Dialing Plan (CDP)

In a true coordinated dialing plan (CDP) between two or more switches, a unique dialing number exists for each extension in the network. If the CDP code fully overlaps the extension DN (the first digits of the extension DN), there can be no duplication of extension DNs on different switches. This is due to the fact that the location code (the CDP steering code) is part of the local extension DN.

For example, a user on switch 2 has the extension 52339. The steering code is 5 and the local extension DN is 2339. Both local users and users at other locations dial 52339 to reach this user. This extension DN cannot exist on any of the other switches. A CDP network is transparent to users because calling a user at another location is as easy as dialing a user at your own location—no prefixes or access codes need to be remembered.

For example, in Figure 3-6, the extensions on the prime switch (Switch 0) are numbered 72000 to 74999 and 81000 to 81999 (the steering codes are 72, 73, 74 and 81). The extensions on Switch 1 are numbered 27000 to 28999, 39000 to 39999 and 40000 to 41999 (the steering codes are 27, 28, 39, 40 and 41). The extensions on Switch 2 are numbered 50000 to 59999 and 70000 to 79999 (the steering codes are 5 and 7). Regardless of which switch a user is service by (Switch 0, Switch 1, or Switch 2), all users dial the same number when calling a user on Switch 2 (for example, 54000).

Location 0 represents switch 0 and switches 1 and 2 are represented by Location 1. More than one location is defined for illustration purposes.

CDP requirements

To use NMS in a CDP network, the following requirements must be met:

1   All mailbox numbers across the network must have the same digit length. The mailbox number includes the CDP steering code and the local mailbox number. If the length of the full mailbox DN varies across the network, NMS will not work.

For example, NMS supports the following mailbox configurations:

—   The length of the CDP steering code is the same for all locations (for example, two digits) and the local mailbox numbers are the same length (three digits). The total mailbox DN length is five.

— The length of the steering code and local mailbox numbers varies across the network, but the length of the full mailbox number (steering code + local mailbox number) is the same across all locations. For example, at Location 2 the steering codes are 5 and 7 and local mailbox numbers are four digits in length. The full mailbox DN length is five (5xxxx). At Location 1, the steering codes are 27, 28, 30, 40 and 41 and the local mailbox numbers are three digits in length. The full mailbox DN length is five (27xxx).

2 The CDP steering code must completely overlap with the local mailbox number. This is described in greater detail in the section "Adding the prime location to a CDP network" on page 3-11.

Figure 1-6
CDP network with three Meridian 1s (two sharing one location)
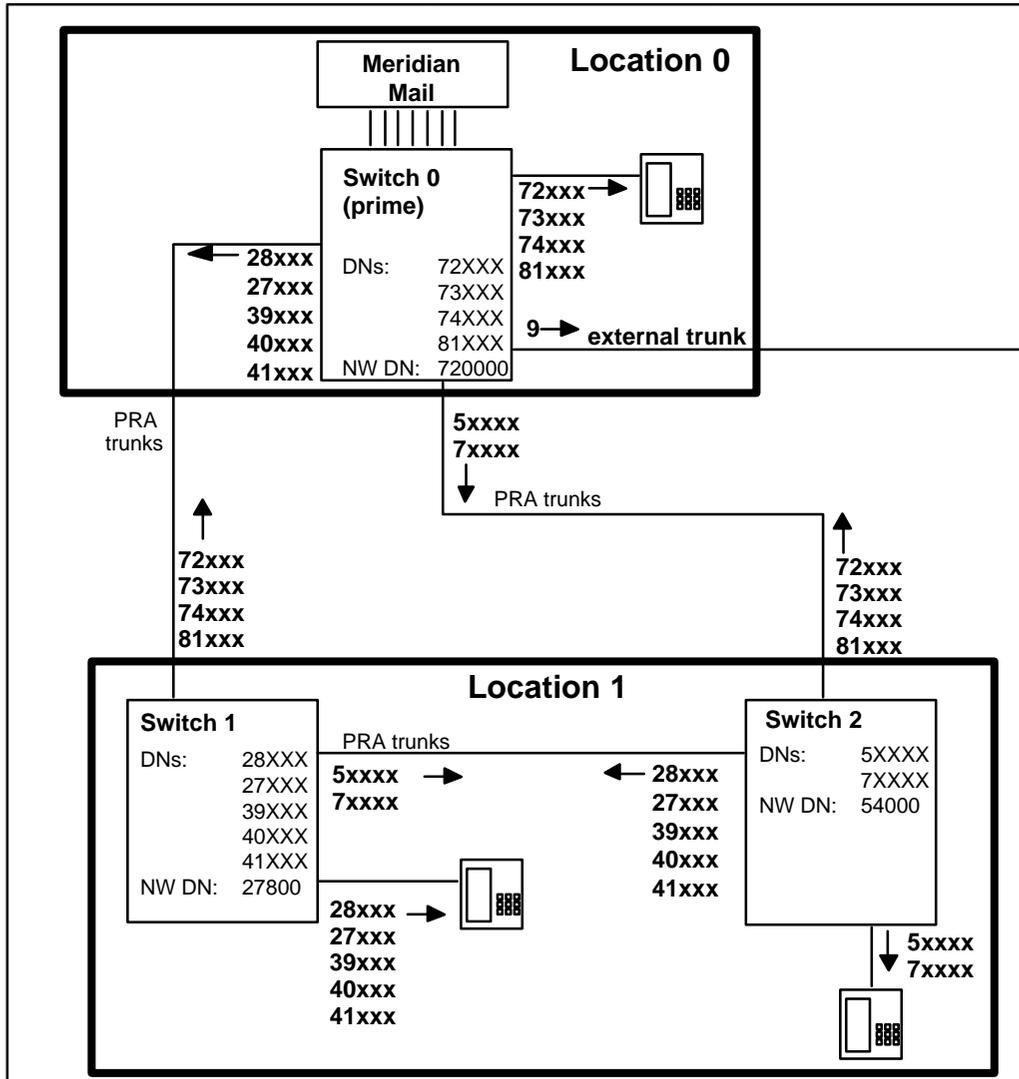
Hybrid dialing plan

If both CDP and ESN are present, then the following restrictions apply:

- The prime switch must support both dialing plans.

- All switches must support ESN.

- Not all switches need to support CDP.

- The restrictions described above for CDP networks apply to those switches that support CDP.

Figure 1-7
Hybrid network with three Meridian 1s
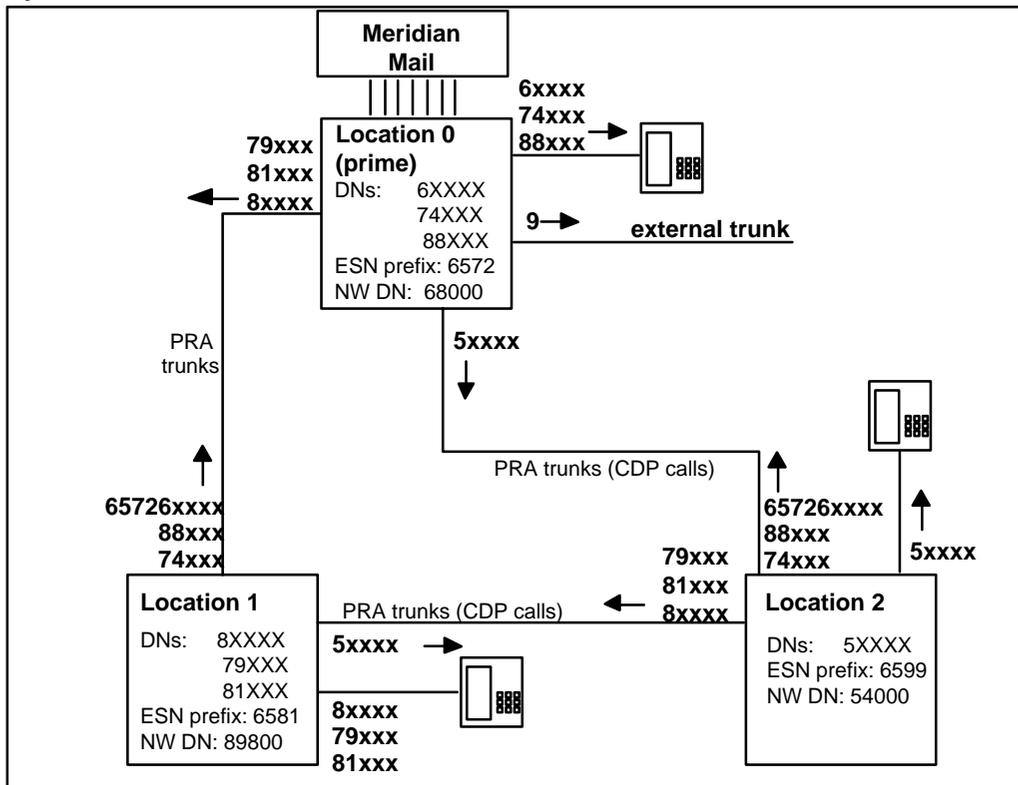
Broadcast messaging within an NMS network

A user can send a broadcast message to all network users at all locations in the NMS network by entering the broadcast mailbox number defined on the voice messaging option screen.

A user can also send a broadcast message to all users at a *specific* location by entering the network location prefix (ESN prefix, CDP code, or mailbox prefix) for the location before the broadcast mailbox number.

For example, assume there are three locations in an NMS network, and an ESN dialing plan is being used. Note, the same concept applies to NMS systems using the CDP dialing plans or where there is no dialing plan. The locations and prefixes for this example are:

- location 0 (prime location), with an ESN prefix of 6330

- location 1, with an ESN prefix of 6331

- location 2, with an ESN prefix of 6332

Also assume the broadcast mailbox number is the default value, 5555. The following table shows what the user must enter to send a broadcast message.

To send to network users at:	Prefix the Broadcast Mailbox with:	The user enters:
All Locations	Nothing	5555
Location 0	Location 0's ESN prefix	6330–5555
Location 1	Location 1's ESN prefix	6331–5555
Location 2	Location 2's ESN prefix	6332–5555

Note: The entire prefix is used regardless of the value in the "Number of Overlapping Digits" field.

Chapter 2: Configuring the switch

Installation on a new system

This section provides instructions for configuring the Meridian 1 on a newly installed network. For information about programming the network, refer to your switch documentation. If you are adding NMS to an existing network, refer instead to the section "Adding NMS to an existing network," beginning on page 2-11.

ATTENTION
Setting an adequate NCOS level
For both new networks and existing networks, it is important that you check the NCOS level for ACD agents (in overlay 11). If the NCOS level is too low, agents will not be able to dial out of the switch. With NMS, agents must be able to dial within the network. Therefore, when considering an NCOS level, you need to select a value that supports a fully-featured Meridian Mail (allowing agents to dial out of the switch for Call Sender and Thru-Dial), but that does not create possible security breaches. Refer to your switch documentation for more information.

Meridian 1 configuration

The following tables indicate how to datafill certain Meridian 1 overlays as required by the Network Message Service.

1. Configure PRI

This step is required only when configuring PRI (primary rate interface) for the first time. Load overlay 73 and respond to the following prompts as shown in Table 2-1.

Table 2-1
Overlay 73: Configuring PRI

Prompts	Responses	Description
REQ	NEW	
TYPE	DDB	Route data block
PREF	xxx	Enter the primary loop reference for the clock controller (0–511).
SREF	xxx	Enter the secondary loop reference for the clock controller (0–511).
TRSH	xx	The PRI threshold set (0–15).
RALM	1-(3)-128	Remote alarm 24-hour threshold
BIPC	0-(2)-128	24-hour bit rate violation
LFAC	0-(3)-128	24-hour loss of frame alignment
BIPV	1-(3)-4 1-(2)-4	Bipolar violation maintenance Bipolar violation out-of-service
SRTK	1-(5)-24 1-(3)-3600	Frame slip maintenance Frame slip out-of-service
SRNT	1-(15)-1024 1-(3)-1024	Frame slip free run maintenance Frame slip free run out-of-service
LFAL	1-(17)-10240 1-(511)-10240	Loss of frame maintenance Loss of frame out-of-service
SRGT	1-(15)-127	Slip rate guard time
SRIM	(1)-27	Slip rate improvement time
SRMM	1-(27)-127	Slip rate exceed maintenance limit

2. Add a PRI loop

Load overlay 17 and respond to the following prompts for X11 release 17 and earlier. For X11 release 18 and later, use Table 2-3.

Table 2-2
Overlay 17: Add a PRI loop (X11 release 17 and earlier)

Prompts	Responses	Description
REQ	CHG	
TYPE	CFN	
CEQU	YES	Change to common equipment.
DLOP	loop dd ff	PRI loop parameters loop = network loop number (1–159) dd = number of data calls (0–24) ff = frame format (D2, D3, D4 (ESF)) ff must be the same for the prime switch and all satellite switches.
MODE	PRI	Primary rate interface.
LCMT	(B8S), AMI	Line coding method. The prime switch and all satellite switches must be configured with the same value. B8S is the default.
YALM	(FDL), DGS	Yellow alarm. The prime switch and all satellite switches must be configured with the same value. FDL is the default.
TRSH	xx	Maintenance and performance threshold as defined in LD 73 (0–15).
DTIC	xxx	Starting network loop slot for the PRI card (0–159).

Table 2-3
Overlay 17: Add a PRI loop (X11 release 18 and later)

Prompts	Responses	Description
REQ	CHG	
TYPE	CFN	
ADAN	NEW CCH xx	Primary D-channel on logical port (0–63).
CTYP	DCHI, MSDL	Card type.
DNUM	xx	Device number of the physical port (0–15).
_PORT	0-3	Port number on the MSDL card (0–3).
USR	PRI, ISDL, SHA	D-channel mode.
_ISLM	xxx	Number of ISL trunks controller by D-channel (1–382).
CDHL	xxx	PRI loop number for DCHI (0, 2, 4, ...158).
OTBF	1-(32)-127	Number of output request buffers.
_BPS	xxxxx	Baud rate for ISL D-channel on the MSDL port. The default is 64000.
_PARM	RS232, (R422) DCE, (DTE)	ISL D-channel interface and transmission mode (MSDL only).
PRI	xxx xx	Additional PRI loops using the same D-channel interface ID (0–158 2–15).
DRAT	(56K), 64KC, 64KI	D-channel transmission.
IFC	SL1	This must be set to SL-1 for Meridian Mail release 8.
SIDE	NET, (USR)	Meridian 1 node type.
RLS	xx	Release ID of the far end switch of the D-channel.
RCAP	MSL, NCT, ND1	Remote channel capabilities
_CLOCK	INT, (EXT)	Internal or external clock on ISL D-channels

Prompts	Responses	Description
LAPD	YES, (NO)	Change LAPD parameters. You may choose NO since the default parameters are sufficient.
_T23	1-(20)-31	Interface guard timer (DCHI) only.
_T200	2-(3)-40	Retransmission timer.
_N200	1-(30)-8	Maximum number of retransmissions.
_N201	4-(260)	Maximum number of octets in the information field.
_T203	2-(10)-40	Maximum time (seconds) without frames being exchanged.
_K	1-(7)	Maximum number of outstanding frames.
ADAN		

3. Add the D-channel card

Load overlay 17 and respond to the following prompts for X11 release 17 and earlier.

Table 2-4
Overlay 17: Add D-channel card (X11 release 17 and earlier)

Prompts	Responses	Description
REQ	CHG	
TYPE	CFN	
ISDN	YES	
DCHI	xx	D-channel port number.
USR	PRA ISDL SHA	D-channel for ISDN/PRA. D-channel for ISL dedicated. D-channel for ISL shared.
IFC	SL1	Interface type is SL-1. ISDN NMS messages will not be sent if IFC is not SL-1.
DCHL	xxx	PRI loop number for DCHI (0, 2, 4, ...158).
OTBF	1-(32)-127	Number of output request buffers.

Prompts	Responses	Description
DRAT	(56K), 64KC, 64KI	D-channel transmission.
PRI	0-158 2-15	Additional PRI loops using same D-channel interface ID.
SIDE	NET (USR)	Meridian 1 node type.
RLS	xx	Release ID of the far end switch of the D-channel. 16 is the minimum SL-1 software release for NMS.
RCAP	MSL, NCT, ND1, ND2, RVQ	Remote channel capabilities.
_CLOCK	INT, (EXT)	Internal or external clock on ISL D-channels.
LAPD	YES, (NO)	Change LAPD parameters.
_T23	1-(20)-31	Interface guard timer (DCHI).
_T200	2-(30)-40	Retransmission timer.
_N200	1-(30)-8	Maximum number of retransmissions.
_N201	4-(260)	Maximum number of octets in the information field.
_T203	2-(10)-40	Maximum time (seconds) without frames being exchanged.
_K	1-(7)	Maximum number of outstanding frames.

4. Define PRI customer

Load overlay 15 and respond to the following prompts.

Table 2-5
Overlay 15: Define PRI customer

Prompts	Responses	Description
REQ	CHG	
TYPE	CDB	Customer data block.
CUST	xx	Meridian 1 customer number.
MATT	NO	Set to NO for the prime switch and all satellite switches.

Prompts	Responses	Description
ISDN	YES	
PNI	_____	Private network identifier. Within an NMS network, use the same PNI value in overlays 15 and 16. When interworking with different networks, enter the PNI of this M1SL-1 in overlay 15, and the remote switch PNI in overlay 16. (This must be a non-zero number in the range 1 to 32700).
AC2	NPA, NXX, INTL, SPN, LOC	If INAC in the route data block of this Meridian 1 is set to YES, the ESN access code for that incoming call type will be inserted automatically.
PFX1	xxxx	Prefix for international PRA.
PFX2	xxxx	Central office prefix for IPRA.
HNPA	100-999	Home number plan area code.
HNXX	100-999	Prefix for central office.
HLOC	100-999	For ESN dialing plans only. Home location code.
LSC	xxxx	For CDP dialing plans only. This is the local steering code of the MSL-1. This prompt only appears for five or six-digit dialing plans. It is used to construct the calling number that is sent across the network.
CNTP	LDN, (PDN)	Default calling line ID.
RCNT	0-(5)	Maximum internode hops in a network redirection call.
HLOC	xxx	For ESN dialing plans only. This is the home location code of the prime switch (100–999).

5. Add PRI route

Load overlay 16 and respond to the following prompts.

Table 2-6
Overlay 16: Add PRI route

Prompts	Responses	Description
REQ	CHG	
TYPE	RDB	Route data block.
CUST	xx	SL-1 customer number.
ROUT	xxx	Route number (0–511).
TKTB	TIE	Trunk type.
PRIV	YES, (NO)	Private route.
ESN	YES, (NO)	ESN signaling.
CNVT	YES, (NO)	Route to conventional switch.
ATDN	(0)-xxxxx	Attendant DN of the ESN main switch.
SAT	YES, (NO)	Trunk route by satellite.
RCLS	INT, (EXT)	Route classmark.
DTRK	YES, (NO)	Digital Trunk.
BRIP	YES, (NO)	ISDN BRI bracket handler route.
ISDN	YES, (NO)	ISN PRI option.
_MODE	PRA, ISDL	Mode of D-channel.
_DCHI	xx	DCHI port number (1–15). Prompted if MODE = ISDL.
_PNI	xxxxx	Customer private ID. This must match the PNI of the far end Customer Data Block, as configured in overlay 15 (1–32700).
_IFC	SL1	Interface type. This must be set to SL1 for Meridian Mail release 8.
_NCNA	YES, (NO)	Network call name allowed.
_NCRD	YES	Network call redirection. This must be set to YES to provide the correct information display for the calling number.
_TRO	YES, (NO)	Trunk optimization.

Prompts	Responses	Description
_CTYP	UNKN, INTL, MPA, NXX, LOC, CDP, SPN	Call type for outgoing tie route. The call type is used by the receiving switch so it can associate a call with a call type and perform ESN insertion. This applies to direct dialing using trunk access codes.
_INAC	YES, (NO)	For ESN dialing plans only. Set this to YES if ESN access code insertion is required. This permits an ESN access code to be automatically added to an incoming ESN call from a private network and is used instead of DMI on the switch, which is not supported. If INAC is YES, the digit insertion (INST) for NARS or BARS calls is bypassed. This prompt appears only if route type is TIE.
_TGAR	xx	Trunk group access restriction (0-31).
PTYP	PRI	Port type at far end.
ICOG	IAO, ICT, OGT	Incoming and/or outgoing trunk.
SRCH	RRB, (LIN)	Hunting for outgoing trunk.
ACOD	xxxx	Route access code.
SIGO	STD ESN2 ESN3 ESN5 ETN	Signaling arrangement.

6. Define trunks

Load overlay 14 and respond to the following prompts.

Table 2-7
Overlay 14: Define trunks

Prompts	Responses	Description
REQ	CHG	
TYPE	TIE	Trunk type.
TN	lll cc	PRI loop. PRI channel.
CUST	0-31	Customer number.
RTMB	0-127 1-254	Route and member number.
CLS	DTN	Class of service.

Note: If you want to autobuild the trunks at the REQ prompt, enter NEW 23.

Adding NMS to an existing Meridian Mail network

When adding NMS to an existing network, a printout of the existing
network database must be obtained to ensure that the network is compatible
with the NMS option or can be modified to meet the NMS standards as
outlined earlier in this chapter. To obtain a printout of the network database
perform the following steps.

1. Print the digital data block (DDB)

Determine if a digital data block has already been configured. Load overlay
73 and respond to the following prompts:

Table 2-8
Overlay 73: Print the DDB

Prompts	Responses	Description
REQ	PRT	
TYPE	DDB	

If there is no DDB, then go to step 1 of "Meridian 1 configuration" on
page 2-2 in this chapter. If there is a DDB, compare it to Table 2-1 to see
if it is compatible with NMS. If it is not, you will have to make
modifications to the existing DDB or create another one.

2. Print the configuration record (CFN)

Load overlay 22 and respond to the following prompts:

Table 2-9
Overlay 22: Printing the CFN

Prompts	Responses	Description
REQ	PRT	
TYPE	CFN	

Check printout and take note of the following prompts:

> PRI loops under the prompt DLOP
> DNUM on X11 RLS 18
> ADAN with MSDL assignments X11 RLS 18
> ISDN prompt
> DCHI prompt
> RLS prompt
> IFC prompt

Existing loops may be used. For prompts that do not have assignments, refer to Steps 1-3 under the section "Meridian 1 configuration" earlier in this chapter, starting on page 2-2.

3. Print customer data block (CDB)

Load overlay 21 and respond to the following prompts:

Table 2-10
Overlay 21: Printing the CDB

Prompts	Responses	Description
REQ	PRT	
TYPE	CDB	Customer data block.
CUST	0-99	Customer number.

Check the assignments for the following prompts. If any of the prompts are unassigned or if modification is required, refer to step 4 of "Meridian 1 configuration" earlier in this chapter.

MATT NO

ISDN YES

PNI Same as the PNI in the satellite switch route data block.

AC2 If INAC in the route data block of this Meridian 1 is set to YES. The ESN access code for that incoming call type will be inserted automatically.

PFX1 Prefix for international PRA.

PFX2 Central office prefix for IPRA.

HNPA Home number plan area code.

HNXX Prefix for central office.

HLOC Home location code.

LSC Local steering code

CNTP   Default calling line ID.

RCNT   Max internode hops in a network redirection call.

HLOC   Home location code.

4. Print route data block (RDB)

Load overlay 21 and respond to the following prompts:

Table 2-11
Overlay 21: Printing the RDB

Prompts	Responses	Description
REQ	PRT	
TYPE	RDB	
CUST	0-99	Customer number.
ROUT	0-511	Route number.
ACOD	xxxx	Route access code.

Compare the printout to Table 1-6 on page 2-8 to determine if any modifications are necessary. If changes are necessary, you can either modify the existing RDB or create a new one specifically for Meridian Mail.

Follow steps 5 to 7 to print out your network's numbering plan. It is necessary to gather this information in order to create a diagram of your network (step 8) as well as to identify any DN conflicts.

5. Print ESN, DMI and RLB

Load overlay 86 and print out the following features:

Table 2-12
Overlay 86: Print ESN data block

Prompts	Responses	Description
REQ	PRT	
CUST	0-99	Customer number.
FEAT	ESN	

Table 2-13
Overlay 86: Digit manipulation index (DMI)

Prompts	Responses	Description
REQ	PRT	
CUST	0-99	Customer number.
FEAT	DGT	

Note: NMS does not support DMI. If DMI exists, then it must be removed in order to support a fully-featured Meridian Mail in an NMS environment.

Table 2-14
Overlay 86: Route list index (RLB)

Prompts	Responses	Description
REQ	PRT	
CUST	0-99	Customer number.
FEAT	RLB	

6. Print NCTL, FCAS and CDP
Load overlay 87 and print out the following features:

Table 2-15
Overlay 87: Network control (NCTL)

Prompts	Responses	Description
REQ	PRT	
CUST	0-99	Customer number.
FEAT	NCTL	

Table 2-16
Overlay 87: Free calling area screening (FCAS)

Prompts	Responses	Description
REQ	PRT	
CUST	0-99	Customer number.
FEAT	FCAS	

Table 2-17
Overlay 87: Coordinated dialing plan (CDP)

Prompts	Responses	Description
REQ	PRT	
CUST	0-99	Customer number.
FEAT	CDP	
TYPE	LSC, DSC, TSC	Steering codes.

7. Print ESN translation table

Load overlay 90 and print out the following features of the ESN translation tables.

Table 2-18
Overlay 90: Location code (LOC)

Prompts	Responses	Description
REQ	PRT	
CUST	0-99	Customer number.
FEAT	NET	
TRANS	AC1, AC2, SUM	
TYPE	LOC	

Table 2-19
Overlay 90: Home NPA translation (HNPA)

Prompts	Responses	Description
REQ	PRT	
CUST	0-99	Customer number.
FEAT	NET	
TRANS	AC1, AC2, SUM	
TYPE	HNPA	

Table 2-20
Overlay 90: Numbering plan area code (NPA)

Prompts	Responses	Description
REQ	PRT	
CUST	0-99	Customer number.
FEAT	NET	
TRANS	AC1, AC2, SUM	
TYPE	NPA	

Table 2-21
Overlay 90: Home location code (HLOC)

Prompts	Responses	Description
REQ	PRT	
CUST	0-99	Customer number.
FEAT	NET	
TRANS	AC1, AC2, SUM	
TYPE	HLOC	

Table 2-22
Overlay 90: Central office translation (NXX)

Prompts	Responses	Description
REQ	PRT	
CUST	0-99	Customer number.
FEAT	NET	
TRANS	AC1, AC2, SUM	
TYPE	NXX	

Table 2-23
Overlay 90: Special number translation (SPN)

Prompts	Responses	Description
REQ	PRT	
CUST	0-99	Customer number.
FEAT	NET	
TRANS	AC1, AC2, SUM	
TYPE	SPN	

8. Create a simplified diagram of the existing network

Figure 2-1 shows an example of a network diagram.

Figure 2-1
Simplified network diagram
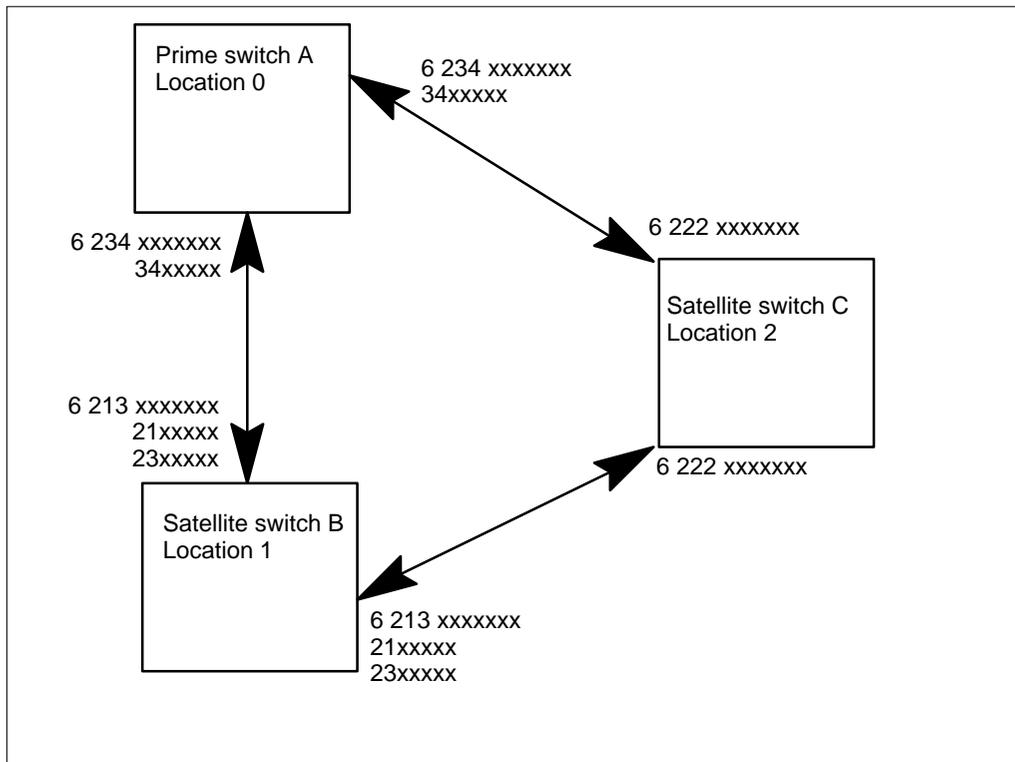
9. Plan NMS implementation

Use the printouts and the diagram to plan the implementation of NMS on the existing network. Before proceeding, it is important that you analyze your printouts in order to identify any conflicts. Modify the Meridian 1 overlays if necessary.

Configuring ACD queues on the Meridian 1

The final step in preparing the Meridian 1 is configuring ACD queues for the voice services that are required. Examples of voice services are Voice Messaging, Express Messaging, Voice Menus, Remote Activation, Voice Forms, and the Transcription Service. Voice service configuration requires work on both the Meridian 1 (where ACD queues are created) and in Meridian Mail (where voice service DNs are defined for each voice service).

In cooperation with the Meridian 1 administrators of the satellite switches, identify the services that are required at each location. For each switch in the network, you will have to configure an ACD queue for each voice service that is required by the users serviced by that switch. At the very least, each location will require Voice Messaging. The Meridian 1 administrators at the other locations may be responsible for configuring the ACD queues for their locations. You will simply have to get a list of ACD DNs from them so that you can configure the VSDN table.

> *Note:* Configuration of voice services is described in detail in the section "Configuring Meridian Mail services" in the "Voice administration" chapter in the *System Administration Guide*. Read this section and the section about the VSDN table before configuring any voice services.

For example, in your NMS network, you have two locations: a prime location and a satellite location. Users at both locations require Voice Messaging and Express Messaging. Figure 2-2 shows an ESN network with two Meridian 1s. Figure 2-3 shows a CDP network with two Meridian 1/SL-1s. Each switch has two ACD queues: one for Voice Messaging and one for Express Messaging. This would result in four entries in the VSDN table on the prime switch.

Since Meridian Mail is connected to the prime switch, you will have to enter the VSDNs for the satellite switches in their network format (that is, include the appropriate location code). In the case of ESN, enter the access code of the *prime* switch, not the satellite switch (this is important if the access codes are different between the two switches).

Figure 2-2
DNs in an ESN network
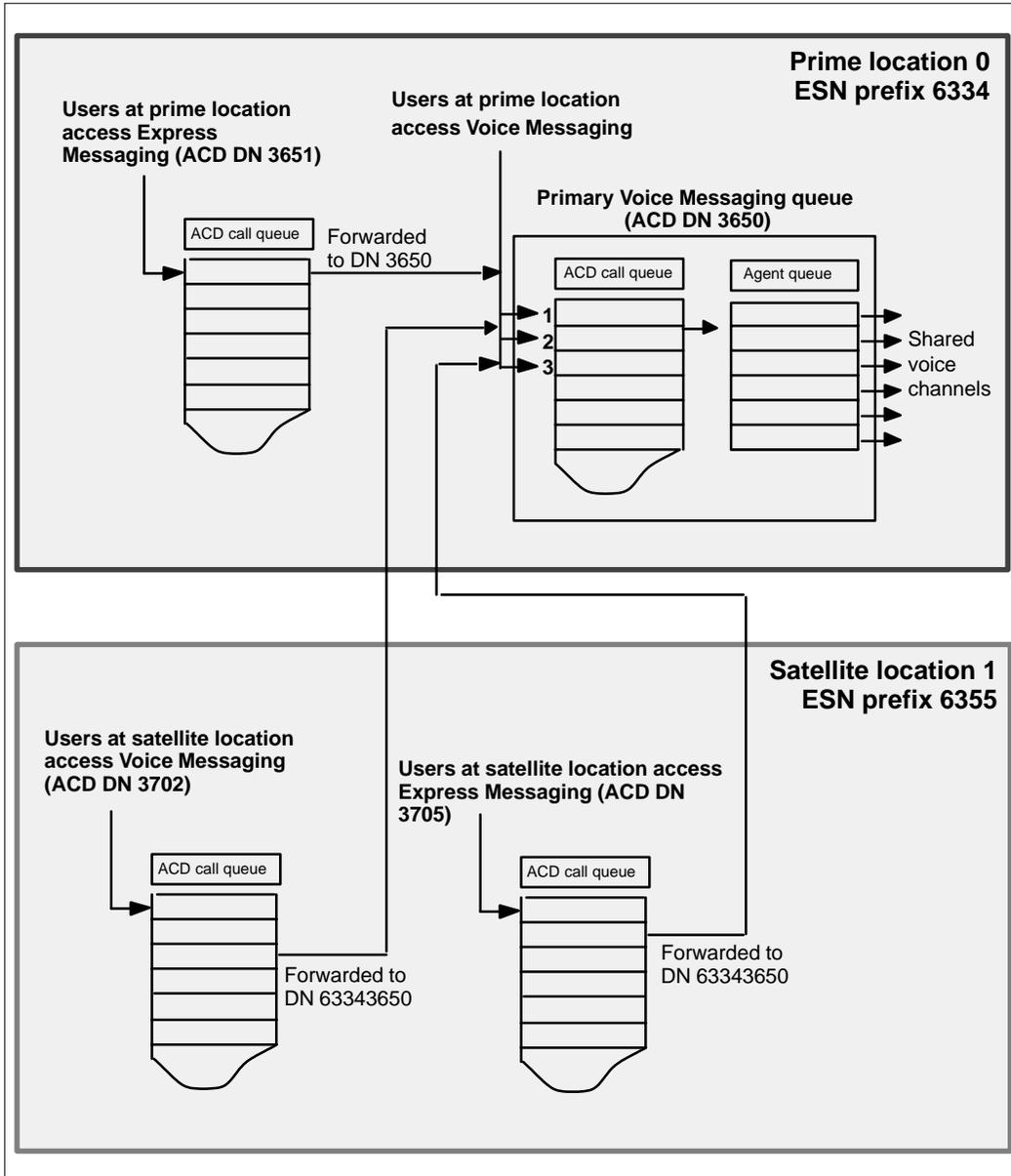
Figure 2-3
DNs in a CDP network
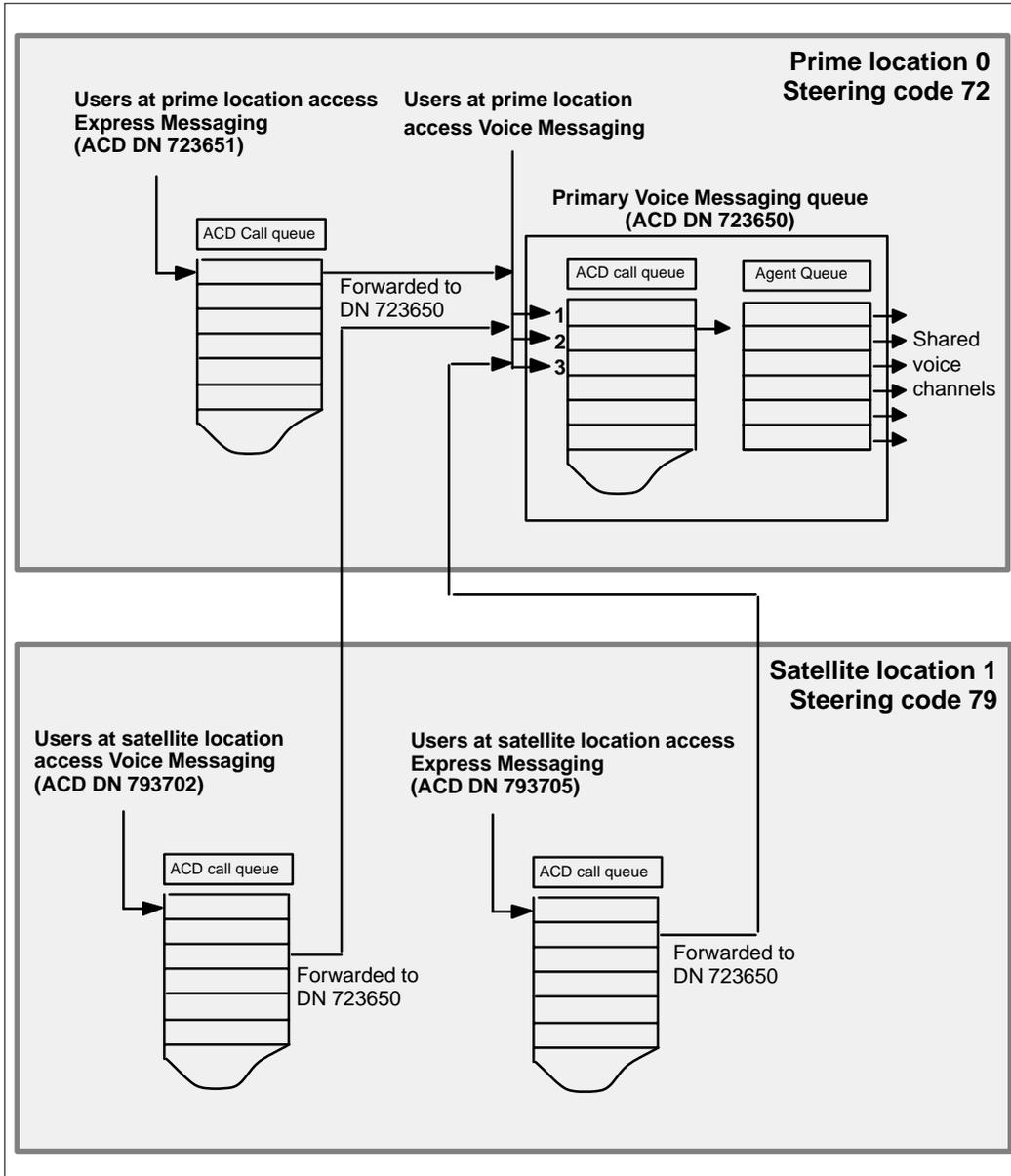
It is recommended that you proceed in the following manner. Detailed procedures are provided on the following pages.

1   For each switch in the network, determine how many ACD queues you will require to provide users with the necessary services. You can also account for additional queues to accommodate any services that you plan on implementing in the future.

2   At the prime switch

   a.   Configure the primary voice messaging ACD queue that contains the agents. This is the voice messaging queue for the prime location. See Procedure 2-1.

   b.   Configure an ACD queue for each additional voice service that is required at the prime location. These queues do not have agents, but forward to the primary voice messaging queue. See Procedure 2-2.

   Note: If a service requires dedicated agents, see the section "Configuring Meridian Mail services" in the "Voice administration" chapter in the *System Administration Guide* for details. The procedures in this chapter assume that voice services will be sharing the agents in the primary voice messaging queue.

3   At each satellite switch

   a.   Configure an ACD queue for the voice messaging service. This queue does not contain agents, but forwards to the primary voice messaging queue at the prime location. See Procedure 2-3.

   b.   Configure an ACD queue for each additional voice service that is required at the satellite location. These queues do not have agents, but forward to the primary voice messaging queue. See Procedure 2-4.

4   Log on to Meridian Mail to define service DNs for the prime location and the satellite locations in the VSDN table. See Procedure 2-1.

Configuring the voice messaging queue for the prime location

Procedure 2-1 explains how to configure an ACD queue for the primary voice messaging queue. This ACD queue will be the voice messaging queue for the prime location. This queue contains all of the agents. All other voice services will share the agents in this queue.

Procedure 2-1
Configuring the primary voice messaging queue for the prime location

Meridian 1 configuration

1   At the prime switch, load overlay 23 to define the primary voice messaging ACD queue.

A series of prompts is displayed in turn.

2   Respond to the prompts as indicated in Table 2-24.

Table 2-24
Overlay 23 for the primary voice messaging ACD queue

Prompts	Responses	Description
REQ	NEW	
TYPE	ACD	ACD data block.
CUST	xx	SL-1 customer number.
ACDN	xxxxxxx	Enter the voice messaging DN for the prime location. This is the number users at the prime location use to access the Voice Messaging service.
MWC	YES	This is a Message Center DN. YES indicates that the queue has agents.
IMS	YES	This is an Integrated Messaging Service.
CMS	YES	Use the Command and Status Link Applications Protocol.
IMA	YES	Enable IMS attendant.
IVMS	YES	Integrated Voice Messaging. This creates a message center from which messages can be retrieved.
VSID	xx	Enter the VAS ID (0–15) from LD 17.

Prompts	Responses	Description
MAXP	xx	Maximum number of ACD agents. This should be equal to the number of DSP ports in the installed voice processor cards.
ALOG	YES	ACD agents associated with this queue are automatically logged on (made available) when Meridian Mail is powered up.
NCFW	0	The DN to which callers are forwarded if the Meridian Mail system fails. If NCFW = 0, callers are forwarded to the attendant. This number is also the DN to which callers are reverted when they press 0, unless otherwise specified in a mailbox user's profile.

The ACD-DN becomes the directory number of the voice messaging service.

3 To configure another ACD queue at the prime switch, enter NEW in response to the REQ prompt. If you do not want to configure more ACD queues at this time, enter END in response to the REQ prompt to exit overlay 23.

At this point you can either

a. Configure ACD queues for other voice services at the prime location. See Procedure 2-2.

b. Log on to Meridian Mail to define VSDNs. See Procedure 2-1.

Configuring queues for other services at the prime location

Procedure 2-2 explains how to configure an ACD queue for a voice service. These service queues do not contain agents, but forward to the primary voice messaging queue at the prime location.

Procedure 2-2
Configuring voice service queues

Meridian 1 configuration

1 Load overlay 23 at the prime switch.

A series of prompts is displayed in turn.

2 Respond to the prompts as shown in Table 2-25.

Table 2-25
Overlay 23 for voice service queues at the prime location

Prompts	Responses	Description
REQ	NEW	
TYPE	ACD	ACD data block.
CUST	xx	Meridian 1 customer number.
ACDN	xxxxxxx	Enter the DN of the voice service.
MWC	NO	This field should be set to NO for voice service queues that forward to the primary queue.
MAXP	1	Maximum number of positions. ***Note:*** Even though no agents are assigned to this queue, this parameter must be set to 1.
NCFW	xxxxxxx	Enter the DN of the primary voice messaging queue that has the agents.

The ACD-DN becomes the directory number of the new service.

3 To add another queue, enter NEW in response to the REQ prompt.

4 When you have added an ACD queue for each voice service that is required at the prime location, enter END in response to the REQ prompt to exit overlay 23.

5 At this point you can either

a. Configure ACD queues at the satellite locations. See Procedure 2-3 to configure the voice messaging ACD queue. See Procedure 2-4 to configure other service ACD queues.

b. Define VSDNs in Meridian Mail. See Procedure 2-1.

Configuring the voice messaging queue for satellite locations

Procedure 2-3 explains how to configure a voice messaging queue on a satellite switch. This queue does not contain agents but forwards to the primary voice messaging queue.

Procedure 2-3
Configuring the voice messaging service for satellite locations

Meridian 1 configuration

1   At the satellite switch, load overlay 23 to define the voice messaging ACD queue.

A series of prompts is displayed in turn.

2   Respond to the prompts as indicated in Table 2-26.

Table 2-26
Overlay 23 for the voice messaging service at a satellite location

Prompts	Responses	Description
REQ	NEW	
TYPE	ACD	ACD data block.
CUST	xx	Meridian 1 customer number.
ACDN	xxxxxxx	Enter the DN of the voice messaging service. This is the number that users at the satellite location use to access the Voice Messaging service. Ensure that this DN is unique across the NMS network.
MWC	YES	This field should be set to NO for voice service queues that forward to the primary queue. However, you must temporarily set MWC to YES so that you can FDN the telephone sets at the satellite location to this queue.*

Prompts	Responses	Description
MAXP	1	Maximum number of positions. ***Note:*** Even though no agents are assigned to this queue, this parameter must be set to 1.
NCFW	xxxxxxx	Enter the DN of the primary voice messaging queue at the prime location. Enter the DN in network format. If the dialing plan for the prime switch is ESN or Hybrid, include the ESN prefix of the prime switch. If the dialing plan is CDP, include the CDP steering code of the prime switch.

*When you have finished programming your telephone sets, return to overlay 23 and set MWC to NO.

The ACD-DN becomes the directory number of the voice messaging service.

3 To configure another ACD queue, enter NEW in response to the REQ prompt. If you do not want to configure more ACD queues at this time, enter END in response to the REQ prompt to exit overlay 23.

At this point you can either

c. Configure ACD queues for other voice services. See Procedure 2-4.

d. Log on to Meridian Mail to define VSDNs. See Procedure 2-1.

Configuring queues for other services at the satellite locations

Procedure 2-4 explains how to configure an ACD queue for a voice service. These service queues do not contain agents, but forward to the primary voice messaging queue at the prime location.

Procedure 2-4
Configuring voice service queues at satellite locations

Meridian 1 configuration

1 Load overlay 23 at the satellite switch.

A series of prompts are displayed in turn.

2 Respond to the prompts as shown in Table 2-27.

Table 2-27
Overlay 23 for voice service queues at satellite locations

Prompts	Responses	Description
REQ	NEW	
TYPE	ACD	ACD data block.
CUST	xx	Meridian 1 customer number.
ACDN	xxxxxxx	Enter the DN of the voice service. Ensure that this DN is unique across the NMS network.
MWC	NO	This field should be set to NO for voice service queues that forward to the primary queue.
MAXP	1	Maximum number of positions. *Note:* Even though no agents are assigned to this queue, this parameter must be set to 1.
NCFW	xxxxxxx	Enter the DN of the primary voice messaging queue at the prime location. Enter the DN in network format. If the dialing plan for the prime switch is ESN or Hybrid, include the ESN prefix of the prime switch. If the dialing plan is CDP, include the CDP steering code of the prime switch.

The ACD-DN becomes the directory number of the new service.

3 To add another queue, enter NEW in response to the REQ prompt.

4 When you have added an ACD queue for each required voice service, enter END in response to the REQ prompt to exit overlay 23.

5 When all necessary ACD queues have been configured at all satellite switches, configure the VSDNs in Meridian Mail. See Procedure 2-1.

Chapter 3: Configuring Meridian Mail

Meridian Mail configuration

You are now ready to configure NMS in Meridian Mail. This involves the following steps.

1   Configure a service DN (in the VSDN table) for each service for which you created an ACD queue. This includes the ACD queues on the prime switch and all satellite switches. See the following section "Configuring VSDNs."

2   Add the prime location. For ESN networks, see page 3-3." For CDP networks, see page 3-11. For Hybrid networks, see page 3-18.

3   Add the satellite locations. For ESN networks, see page 3-8. For CDP networks, see page 3-16. For Hybrid networks, see page 3-24.

4   Test the NMS network. See page 3-29.

5   Add users to the locations.

   a.   Add users to the prime location.

   b.   Change the default administration context.

   c.   Add users to the first satellite location.

   d.   Change the default administration context.

   e.   Add users to the next satellite location. Continue until users have been added to all locations in the NMS network.

   See "Adding local voice users" in the "User administration" chapter in the *System Administration Guide*.

6   Back up the network.

Configuring VSDNs

Once ACD queues have been created on the prime switch and satellite switches, you are ready to define VSDNs in Meridian Mail.

Procedure 2-1
Configuring VSDNs in Meridian Mail

1 Log on to Meridian Mail at the main administration terminal.

2 Select Voice Administration from the main menu.

3 Select Voice Services Administration.

4 Select Voice Services-DN Table.

5 Add a DN to the VSDN table tor each ACD DN that was configured at the prime location and all satellite locations. Enter the appropriate ACD DN in the *Access DN* field in the Add DN Information screen. For services at satellite locations, enter the DN in network format. (For CDP, include the steering code for the satellite location. For ESN, include the access code of the prime switch and the routing prefix of the satellite location.) For more information about adding DNs, see the section "Adding DN information" in the "Voice administration" chapter in the *System Administration Guide*.

Configuring Meridian Mail for an ESN-only network

Follow these guidelines if your network uses an ESN-only dialing plan.

1 Define the prime location (the switch to which the Meridian Mail server is attached). See "Adding the prime location". (If the Networking feature is also installed, access the list of locations from the Local Site Maintenance option in the Network Administration menu.)

2 Create a satellite location for each ESN prefix in the NMS network. See "Adding satellite locations".

For each location

3 Enter the location name and select ESN as the dialing plan.

4 Enter the maximum number of digits in the local mailbox numbers. The maximum value is 18.

5 Enter the ESN access code for the location you are defining. If there is a public network access code, you may enter this in the second field.

6 Enter the number of digits in the ESN prefixes that overlap with the local extension. (If there is no overlap, enter 0.)

7   Enter the ESN prefixes (access code + routing prefix) for the location. For satellite locations, the access code must be the access code of the prime location. (If two access codes are defined for the prime location, use the one in the first field.)

8   Record a spoken name for the location, if desired. (This is highly recommended, especially if you plan on using broadcast messages.)

9   Specify whether or not mailbox numbers are the same as the extension DNs. If mailbox numbering does not follow the dialing plan, perform step 10.

10   Enter a mailbox prefix if mailbox numbering does not follow the dialing plan.

Adding the prime location to an ESN network

The first time you select Network Administration from the main menu after NMS has been installed, the Add Location screen automatically appears. This is where you add the prime location. The prime location is where the Meridian Mail system actually resides. This location must be configured before any satellite locations. The *Location Number* field will already be filled in as 0. This is the default location ID for the prime location and cannot be changed. You can modify the prime location, but you cannot delete it.

Figure 3-1
The Add Location screen for the prime location in an ESN network

```
                         Network Administration
       Add Local Location


       Location number:  0
       Location name:     prime


       Dialing plan:      ESN CDP Hybrid
       Max number of digits in local mailbox:        4


       ESN access codes:      6
       Number of overlapping digits between ESN prefix and local ext:        0
       ESN prefixes (they must begin with 6):
       6338


       Mailbox numbering follows dialing plan:       Yes No

       Spoken name recorded (Voice)     No




            Save          Cancel                                    Voice
```

Field Descriptions

Note: The same fields are displayed for the prime locations as well as for satellite locations. Therefore, the following descriptions also apply to satellite locations.

- *Location number* This number uniquely identifies the location within the NMS site.

  For the prime location, the default is 0. This value cannot be changed.

  For satellite locations, this field cannot be modified from within this screen. To change the Location Number for a satellite location, delete the location and re-add it. When you press [Add] you are prompted for a new ID. The valid range is from 1 to 59.

  Note: If the Meridian Mail system is part of a Meridian Mail Network, the location number must correspond between sites. For example, local site A, location 2, should also be defined as a remote site, location 2, in site B.

- *Location name* This field must be filled in. The name should be unique and easily identify the location within the network. You may enter up to 32 alphanumeric characters. There is no default.

- *Dialing plan* The selection you make depends on your organization's dialing plan. The default is Hybrid. Select ESN for an ESN network.

- *Maximum number of digits in local mailbox* The maximum number of digits used in mailbox numbers at this location. If you are unsure, enter 18, the maximum allowable value.

- *ESN access codes* This code is used to access the ESN network. Each switch in the network may have a different access code. Enter the access code for this location's switch.

  You may enter two different ESN access codes of one or two digits each. Typical codes are 6 or 9. In the second ESN access field, enter the public network access code, if there is one. Check your dialing plan for the correct codes.

- *Number of overlapping digits between ESN prefix and local ext.:* You must enter a value in this field. If you leave it blank, it will revert to the previous value. If there are no numbers in common between the ESN prefixes and the local extensions, enter a value of 0

This field appears only when the dialing plan is ESN or Hybrid. This number indicates the number of digits in the ESN prefixes that overlap with the local extension. Meridian Mail uses this value to convert between local and network formats of the mailbox numbers. For example, a five-digit local extension may overlap with the last digit of a three-digit ESN prefix (for example, ESN DN 338 3000 may refer to the local DN 83000).

Note: If you enter a non-zero value in this field, the mailbox numbers of all users you enter for this location must begin with the overlap digits of the ESN prefix. For example, if the last digit (3) of the ESN prefix overlaps into the local extension, then all mailbox numbers entered for this location must begin with 3.

- *ESN prefixes* Enter the routing prefix preceded by the ESN access code (access code + routing prefix) for each ESN prefix. For example, if the access code is 6 and the routing prefix is 338, enter 6338.

  The ESN prefixes must not conflict with other network codes. There is a conflict if there is overlap between two location codes. For example, there is a conflict between the ESN prefixes 665 and 6651. If a message is addressed to 6651224, the system cannot tell if this means ESN prefix 665 mailbox 1224 or ESN prefix 6651 mailbox 224.

  Note: For satellite locations, enter the access code of the prime location. If two access codes were defined for the prime location, use the one that was entered in the first field.

- *Mailbox numbering follows dialing plan* Answer Yes if the local mailbox numbers at this location are the same as local extensions on the switch (recommended). If you answer No, the following field, *Mailbox Prefixes*, appears and you must enter the location codes as mailbox prefixes.

- *Mailbox Prefixes* This field is applicable only if mailbox numbering at the location does not follow the dialing plan (in this case, a mailbox prefix is required to identify each location). Enter a unique identifier as the mailbox prefix. This prefix is used to identify the location within the network and must be unique across the network. Ensure that it does not conflict with other network data or mailbox numbers. This prefix does not have any overlap with local mailbox numbers and is independent of the ESN prefixes and CDP steering codes.

- *Spoken name recorded (Voice)* This field is read–only. It indicates whether or not a spoken location name has been recorded for this location. If a spoken name is recorded, voice mail users hear the location name followed by the local mailbox digits. For example, *"Murray Road, Mailbox 2346."* If a name is not recorded for the location, users hear the location prefix followed by the mailbox number. For example, *"6655 Mailbox 2346."* A name can be recorded from this screen by using the voice key (see the following section.) The default is No.

The following actions are possible from this screen:

[Voice]	Use this softkey to record a spoken name for the location. This voice recording will identify the location to users when sending messages to, or receiving messages from the location.
[Save]	This action saves the location in the network database. The List Locations screen is re-displayed.
[Cancel]	Entries made in this screen are discarded and you are returned to the List Locations screen.

Procedure 3-2
Adding the prime location to an ESN network

Starting point: The main menu

1 Select Network Administration.

The Add Location screen is displayed.

2 Set Dialing Plan to ESN.

3 Fill in the fields. See the field descriptions on the previous pages.

4 Use [Save] to save the configuration and exit the screen.

The List Locations screen is displayed, with one location, the prime location, listed.

5 To exit the screen, go to step 5a.
To add a satellite location, go to step 5b.

    a. Press [Exit].

       You are returned to the Network Administration menu.

    b. Press [Add].

See "Adding satellite locations to an ESN network" on page 3-8.

Listing locations

Once data has been entered for the prime location, the List Locations
(Figure 3-2) screen will appear whenever you select Network
Administration from the main menu. The List Locations screen displays all
of the locations in your NMS Network and provides the softkeys required
to add, view, modify and delete them.

> *Note:* If Meridian Mail Networking is also installed on your system,
> refer to your Networking NTP, for instructions on adding and
> modifying local and remote sites and NMS locations.

Figure 3-2
The List Locations screen

```
                        Network Administration
  List of Local Locations


            Location          Location Name

               0              prime
               1              satellite














    Exit           Add        View/Modify      Delete       Print
                                                          Network Data
```

The following fields are displayed:

- *Location* This is the ID that uniquely identifies the location within the
  NMS site. You can enter an integer between 0 and 59. The prime
  location is always 0.

- *Location Name* This should be a unique name corresponding to the
  location (such as a street name, city name, and so on).

The following actions are possible from this screen:

[Add]	This action adds a new location. You will are prompted for a location number for the new location.
[View/Modify]	Use the cursor keys to highlight the location you want to view or modify. Press <Spacebar> to select the location. Press [View/Modify] to display the View/Modify Location screen.
[Delete]	Select the location you want to delete with the cursor keys. A new set of softkeys are displayed. See page 3-28.
[Print Network Data]	This action prints location site information from the network data base. Ensure that the printer is on-line before making this selection. See page 3-29 for details.
[Exit]	The Network Administration menu is displayed.

CAUTION

Changing the network data

If you plan on altering the network data fundamentally, such as by changing location codes or by adding or deleting locations, you should do so after hours when users are not logged on. Otherwise, users may may not be able to log on or will not be able to compose messages to affected mailboxes. It is recommended that you carefully plan network sites and locations before installation to avoid changing the configuration.

Adding satellite locations to an ESN network

The same Add Location screen that is used to add the prime location is also used to add satellite locations to your NMS network.

To access the screen, press [Add] on the List Locations screen. You are first prompted to enter a location number (in the range 1 to 59). It is recommended that location numbers be assigned in ascending numerical

---

sequence. The Add Location screen is displayed when you have entered a number and pressed <Return>.

Figure 3-3 shows a sample datafill for a satellite location in an ESN network. Refer to the section "Adding the prime location to an ESN network" for field descriptions.

Figure 3-3
The Add Location screen for a satellite location in an ESN network

```
                          Network Administration
        Add Local Location

        Location number:  1
        Location name:    satellite_____

        Dialing plan:     ESN
        Max number of digits in local mailbox:        4_

        ESN access codes:     6__              ___
        Number of overlapping digits between ESN prefix and local ext:        0_
        ESN prefixes (they must begin with 6):
        6123_____      _____      _____      _____      _____
        _____      _____      _____      _____      _____

        Mailbox numbering follows dialing plan:        Yes No

        Spoken name recorded (Voice)     No



         Save         Cancel                                        Voice
```

Configuring Meridian Mail for a CDP-only network

If you are going to configure one large location to represent all switches in the network follow the instructions under "Creating one large location". If you need to configure a number of locations, use the procedure "Adding multiple locations". (If the networking feature is also installed, access the list of locations from the Local Site Maintenance option in the Network Administration menu.)

Creating one large location
For the prime location

1   Enter the location name and select CDP as the dialing plan.

2   Enter the maximum number of digits in the local mailbox numbers. The maximum allowable value is 18.

3   Enter 10 as the number of digits in the CDP code that overlap with the local extension.

4   Enter any number in the first field provided for CDP steering codes. It is not really necessary to enter any CDP steering codes, however, the system demands at least one entry.

5   From the User Administration screens, enter user mailbox information as if all the users belonged on the same switch (the physical location of the user does not really matter). See the "User Administration" chapter in the *System Administration Guide*, for more information.

6   From the Voice Administration screens, enter the service DNs in the VSDN table as you would for a non-NMS system. See the "Voice Administration" chapter in the *System Administration Guide*.

Creating multiple locations

Follow the procedure below if you need to configure a number of locations. This may be the case if the number of steering codes is greater than 10 if you were to have only one location.

Important: The full mailbox DN length (steering code + local mailbox number) must be the same across all locations in the network.

1   Define the prime location (the switch to which the Meridian Mail server is attached). See "Adding the prime location to a CDP network". (If the Networking feature is also installed, access the list of locations from the Local Site Maintenance option in the Network Administration menu.)

2   Create the number of required satellite locations.

For each location (prime and satellite):

3   Enter the location name and select CDP as the dialing plan.

4   Enter the maximum number of digits in the local mailbox numbers. The maximum allowable value is 18.

5   Enter the number of digits in the CDP steering code that overlap with the local extension.

Note: As as rule the CDP steering code must completely overlap the local extension. For example, if the steering code is 73, the local extension is in the format 73xx. If the CDP steering code does overlap, enter the length of the longest steering code in this field.

6   Enter all of the CDP steering codes for the location.

7   Specify whether or not mailbox numbers are the same as the extension DNs. If mailbox numbering does not follow the dialing plan, perform step 8.

8   Enter a mailbox prefix if mailbox numbering does not follow the dialing plan.

Adding the prime location to a CDP network

The first time you select Network Administration from the main menu after NMS has been installed, the Add Location screen automatically appears. This is where you add the prime location. The prime location is where the Meridian Mail system actually resides. This location must be configured before any satellite locations. The *Location Number* field will already be filled in as "0". This is the default location ID for the prime location. You can modify the prime location, but you cannot delete it.

Figure 3-4 shows a sample datafill for the prime location in a CDP network.

Figure 3-4
The Add Location screen for the prime location in a CDP network

```
                         Network Administration
  View/Modify Local Location

  Location number:  0
  Location name:    prime_____

  Dialing plan:     ESN  CDP  Hybrid
  Max number of digits in local mailbox:       4_

  Number of overlapping digits between CDP steering code and local ext: 10
  CDP Steering Codes:
    1:67_____     2:_____     3:_____     4:_____     5:_____

  Mailbox numbering follows dialing plan:        Yes  No

  Spoken name recorded (Voice)     No




      Save           Cancel                         More CDP         Voice
                                                     Fields
```

Field Descriptions

The same fields are displayed for the prime locations as well as for satellite locations. Therefore, the following descriptions also apply to satellite locations.

- *Location number* This number uniquely identifies the location within the NMS site.

  For the prime location, the default is 0. This value cannot be changed.

  For satellite locations, this field cannot be modified from within this screen. To change the Location Number for a satellite location, delete the location and re-add it. When you press [Add] you are prompted for a new ID. The valid range is from 1 to 59.

- *Location name* This field must be filled in. The name should be unique and easily identify the location within the network. You may enter up to 32 alphanumeric characters. There is no default.

- *Dialing plan* The selection you make depends on your organization's dialing plan. The default is Hybrid. Select CDP.

  When CDP is selected, [Voice] is no longer displayed. This is because in a CDP dialing plan, other locations are transparent to voice messaging users and a recorded location name is not required.

  See "Coordinated dialing plan (CDP)" earlier in this chapter for a description of the different types of dialing plans and important information about requirements and limitations.

- *Maximum number of digits in local mailbox* The maximum number of digits used in mailbox numbers at this location. The maximum value is 18 . If you are unsure, enter the maximum allowable value.

- *Number of overlapping digits between CDP steering code and local ext* In a CDP network, there is usually complete overlap between the CDP steering code and the local extensions. In other words, this number equals the length of the CDP steering code. For example, if the steering code is 74 enter 2 in this field.

- *CDP steering codes* Enter up to 50 CDP steering codes for the prime location. These are location codes that identify the location within the network. These codes must not conflict with other network codes. There is a conflict if there is overlap between two location codes.

- *Mailbox numbering follows dialing plan* Answer Yes if the local mailbox numbers at this location are the same as local extensions on the switch. If you answer No, the following field, *Mailbox Prefixes*, appears and you must enter the location codes as mailbox prefixes.

- *Mailbox prefixes* This field is applicable only if mailbox numbering at the location does not follow the dialing plan (and therefore CDP steering codes do not apply). Enter a unique identifier as the mailbox prefix. This prefix is used to identify the location within the network and must be unique across the network. Ensure that it does not conflict with other network data or mailbox numbers. This prefix does not have any overlap with local mailbox numbers and is independent of the CDP steering codes.

The following actions are possible from this screen:

[Voice]	This softkey is displayed only if the dialing plan is ESN or Hybrid. Use this softkey to record a spoken name for the location. This voice recording will identify the location to users when sending messages to, or receiving messages from the location.
[Save]	This action saves the location in the network database. The List Locations screen is re-displayed.
[Cancel]	Entries made in this screen are discarded and you are returned to the List Locations screen.

Procedure 3-3
Adding the prime location

Starting point: The main menu

1   Select Network Administration.

The Add Location screen is displayed.

2   Fill in the fields. See the field descriptions on the previous pages.

3   Press [Save] to save the configuration and exit the screen.

The List Locations screen is displayed, with one location, the prime location, listed.

4 To exit the screen, go to step 4a.
To add a satellite location, go to step 4b.

    a. Press [Exit].

    You are returned to the Network Administration menu.

    b. Press [Add].

    See "Adding satellite locations to a CDP network" later in this chapter for details.

Listing locations

Once data has been entered for the prime location, the List Locations (Figure 3-5) screen will appear whenever you select Network Administration from the main menu. The List Locations screen displays all of the locations in your NMS Network and provides the softkeys required to add, view, modify and delete them.

Note: If Meridian Mail Networking is also installed on your system refer to your Networking NTPs for instructions on adding and modifying local and remote sites and NMS locations.

Figure 3-5
The List Locations screen


```
                        Network Administration
  List of Local Locations


            Location          Location Name

               0              prime
               1              satellite
```

| Exit | Add | View/Modify | Delete | Print Network Data |

The following fields are displayed:

- *Location* This is the ID that uniquely identifies the location within the NMS site. You can enter an integer between 0 and 59. The prime location is always 0.

- *Location name* This should be a unique name corresponding to the location (such as a street name, city name, and so on).

The following actions are possible from this screen:

[Add]	This action adds a new location. You will are prompted for a location number for the new location.
[View/Modify]	Use the cursor keys to highlight the location you want to view or modify. Press the <Spacebar> to select the location. Press [View/Modify] to display the View/Modify Location screen.
[Delete]	Select the location you want to delete with the cursor keys. A new set of softkeys are displayed. See page 3-28.
[Print Network Data]	This action prints location site information from the network data base. Ensure that the printer is on-line before making this selection. See page 3-29 for details.
[Exit]	The Network Administration menu is displayed.

CAUTION

Changing the network data
If you plan on altering the network data fundamentally, such as by changing location codes or by adding or deleting locations, you should do so after hours when users are not logged on. Otherwise, users may may not be able to log on or will not be able to compose messages to affected mailboxes. It is recommended that you carefully plan network sites and locations before installation to avoid changing the configuration.

Adding satellite locations to a CDP network

The same Add Location screen that is used to add the prime location is also used to add satellite locations to your NMS network.

To access the screen, press [Add] on the List Locations screen. You are first prompted to enter a location number (in the range 1 to 59). It is recommended that location numbers be assigned in ascending numerical sequence. The Add Location screen is displayed when you have entered a number and pressed <Return>.

Figure 3-6 shows a sample datafill for a satellite location in a CDP network. Refer to the section "Adding the prime location to a CDP network" for field descriptions.

Figure 3-6
The Add Location screen for a satellite location in a CDP network

```
                        Network Administration
   View/Modify Local Location

   Location number:  1
   Location name:    satellite_____

   Dialing plan:     CDP
   Max number of digits in local mailbox:      4_

   Number of overlapping digits between CDP steering code and local ext: 10
   CDP Steering Codes:
     1:89_____    2:_____    3:_____    4:_____    5:_____

   Mailbox numbering follows dialing plan:        Yes No

   Spoken name recorded (Voice)     No




   _____

      Save          Cancel                        More CDP        Voice
                                                  Fields
```

Configuring Meridian Mail for a Hybrid network
Hybrid ESN and CDP network with uniform dialing numbers

Follow these guidelines if both an ESN and CDP dialing plan are implemented in your organization's network. All switches in such a network must have ESN prefixes. It is not necessary for all switches to be part of the coordinated dialing plan (CDP). The prime switch must be part of both numbering plans. Determining the setup in the network database will depend largely on how the CDP is structured.

> *Important:* In the case of CDP, the full mailbox DN length (steering code + local mailbox number) must be the same across all CDP locations in the network.

All CDP switches share the same ESN prefixes

Configure the prime switch to represent all of the switches that are part of the CDP network. Select Hybrid as the dialing plan and enter the appropriate ESN prefixes. For those locations that are ESN-only, use the configuration guidelines outlined in "ESN network with uniform dialing numbers".

Each CDP switch has its own ESN prefixes

1 Define the prime location (the switch to which the Meridian Mail server is attached). See "Adding the prime location to a hybrid network". (If the Networking feature is also installed, access the list of locations from the Local Site Maintenance option in the Network Administration menu.)

2 Create a satellite location for each switch in the NMS network. See the section "Adding satellite locations to a hybrid network".

For each location that is ESN only, follow the instructions outlined in the section "Configuring Meridian Mail for an ESN-only network" on page 3-2.

For each location that is also part of the CDP:

3 Enter the location name and select Hybrid as the dialing plan.

4 Enter the maximum number of digits in the mailbox numbers at this location.

5 Enter the ESN access codes for the location you are defining.

6 Enter the number of digits in the ESN prefixes that overlap with the local extension DNs. (If there is no overlap, enter 0.)

7 Enter the ESN prefixes. Each prefix must begin with the first access code defined on the prime location. If two access codes are defined for the prime location, use the one that is defined in the first field.

8 Enter the number of digits in the CDP steering codes that overlap with the local extension DNs.

Important: The CDP steering code must completely overlap with the local extension. For example, if the steering code is two digits in length, the overlap is two.

9 Enter the CDP steering codes. The number must be in the format in which Meridian Mail will dial the prefix if a call is to be placed from the Meridian Mail server.

10 Record a spoken name for the location, if desired.

11 Specify whether or not mailbox numbers at this location are the same as the extension DNs. If mailbox numbering does not follow the dialing plan, perform step 12.

12 Enter a mailbox prefix if mailbox numbering does not follow the dialing plan.

Adding the prime location to a hybrid network

The first time you select Network Administration from the main menu after NMS has been installed, the Add Location screen automatically appears. This is where you add the prime location. The prime location is where the Meridian Mail system actually resides. This location must be configured before any satellite locations. The *Location Number* field will already be filled in as 0. This is the default location ID for the prime location. You can modify the prime location, but you cannot delete it.

Figure 3-7 shows the Add Location screen for the prime location in a hybrid network.

Figure 3-7
The Add Location screen for the prime location in a hybrid network

```
                        Network Administration
   View/Modify Local Location

   Location number:  0
   Location name:    prime_____

   Dialing plan:     ESN CDP Hybrid
   Max number of digits in local mailbox:         4_

   ESN access codes:      6__          ___
   Number of overlapping digits between ESN prefix and local ext:        0_
   ESN prefixes (they must begin with 6):
   6333_____   _____   _____   _____   _____
   _____   _____   _____   _____   _____


   Number of overlapping digits between CDP steering code and local ext: 10
   CDP Steering Codes:
     1:45_____    2:_____   3:_____   4:_____   5:_____

                                                           MORE BELOW


      Save          Cancel                      More CDP        Voice
                                                Fields
```

Field descriptions

The same fields are displayed for the prime locations well as for satellite locations. Therefore, the following descriptions also apply to satellite locations.

- *Location number*   This number uniquely identifies the location within the NMS site.

  For the prime location, the default is 0. This value cannot be changed.

  For satellite locations, this field cannot be modified from within this screen. To change the Location Number for a satellite location, delete the location and re-add it. When you press [Add] you are prompted for a new ID. The valid range is from 1 to 59.

- *Location name*   This field must be filled in. The name should be unique and easily identify the location within the network. You may enter up to 32 alphanumeric characters. There is no default.

- *Dialing plan*   The selection you make depends on your organization's dialing plan. The default is Hybrid. See "Dialing plans and location codes" earlier in this chapter for a description of the different types of dialing plans and important information about requirements and limitations.

Note 1: If you change a Hybrid location to CDP-only, the location voice name is removed. If you change the location back to Hybrid, you will have to re-record the verification.

Note 2: If the dialing plan for the prime location is set to Hybrid, only the ESN and Hybrid dialing plans are available for the satellite locations.

- *Maximum number of digits in local mailbox*   This is the maximum number of digits used in mailbox numbers at this location. The maximum value is 18. If you are unsure enter the maximum value.

- *ESN Access codes*   This field appears only when the dialing plan is ESN or Hybrid. This code is used to access the ESN network. Each switch in the network may have a different access code. Enter the access code for this location's switch.

  You may enter two different ESN access codes of one or two digits each. Typical codes are 6 or 9. In the second ESN access code field, enter the public network access code, if there is one. Check your dialing plan for the correct codes.

- *ESN prefixes*   Enter the routing prefix preceded by the ESN access code (access code + routing prefix). For example, if the access code is 6 and the routing prefix is 338, enter 6338.

  This code must not conflict with other network codes. There is a conflict if there is overlap between two location codes. For example, there is a conflict between the ESN prefixes 665 and 6651. If a message is addressed to 6651224, the system cannot tell if this means ESN prefix 665 mailbox 1224 or ESN prefix 6651 mailbox 224.

  Note: For satellite locations, enter the access code of the prime location. If two access codes were defined for the prime location, use the one that was entered in the first field.

- *Number of overlapping digits between CDP steering code and local extension* This field appears only when the dialing plan is CDP or Hybrid. In a CDP network, there must be complete overlap between the CDP steering code and the local extensions. In other words, this number must equal the length of the CDP steering code. For example, if the steering code is 77 enter 2 in this field.

- *CDP steering codes* Enter up to 50 CDP steering codes for the prime location. These are location codes that identify the location within the network. These codes must not conflict with other network codes. There is a conflict if there is overlap between two location codes.

- *Mailbox Numbering follows Dialing Plan* Answer "Yes" if the local mailbox numbers at this location are the same as local extensions on the switch. If you answer "No," the following field, *Mailbox Prefixes*, appears and you must enter the location codes as mailbox prefixes.

- *Mailbox Prefixes* This field is applicable only if mailbox numbering at the location does not follow the dialing plan (and therefore ESN prefixes or CDP steering codes do not apply). Enter a unique identifier as the mailbox prefix. This prefix is used to identify the location within the network and must be unique across the network. Ensure that it does not conflict with other network data or mailbox numbers. This prefix does not have any overlap with local mailbox numbers and is independent of the ESN prefixes and CDP steering codes.

- *Location Name Recorded (Voice)* This field only applies if an ESN or Hybrid dialing plan is in place. It indicates whether or not a spoken location name has been recorded for this site. If a spoken name is recorded, voice mail users hear the location name followed by the local mailbox digits. For example, *"Murray Road, Mailbox 2346."* If a name is not recorded for the location, users hear the ESN location prefix followed by the mailbox number. For example, *"6889 Mailbox 2346."* A name can be recorded from this screen by using the voice key (see the following section.) The default is No.

The following actions are possible from this screen:

[Voice]	Use this softkey to record a spoken name for the location. This voice recording will identify the location to users when sending messages to, or receiving messages from the location.
[Save]	This action saves the location in the network database. The List Locations screen is re-displayed.
[Cancel]	Entries made in this screen are discarded and you are returned to the List Locations screen.

Procedure 3-4
Adding the prime location to a hybrid network

Starting point: The main menu

1   Select Network Administration.

    The Add Location screen is displayed.

2   Fill in the fields. See the field descriptions on the previous pages.

3   Press [Save] to save the configuration and exit the screen.

    The List Locations screen is displayed, with one location, the prime location, listed.

4   To exit the screen, go to step 4a.
    To add a satellite location, go to step 4b.

    a.   Press [Exit].

         You are returned to the Network Administration menu.

    b.   Press [Add].

         See "Adding satellite locations to a hybrid network" later in this chapter for details.

Listing locations

Once data has been entered for the prime location, the List Locations (Figure 3-8) screen will appear whenever you select Network Administration from the main menu. The List Locations screen displays all of the locations in your NMS network and provides the softkeys required to add, view, modify and delete them.

Note: If Meridian Mail Networking is also installed on your system, refer to your Networking NTPs for instructions on adding and modifying local and remote sites and NMS locations.

Figure 3-8
The List Locations screen

```
                          Network Administration
   List of Local Locations


            Location          Location Name

                 0            prime
                 1            satellite










     Exit            Add          View/Modify        Delete        Print
                                                                Network Data
```

The following fields are displayed:

- *Location* This is the ID that uniquely identifies the location within the NMS site. You can enter an integer between 0 and 59. The prime location is always 0.

- *Location name* This should be a unique name corresponding to the location (such as a street name, city name, and so on).

The following actions are possible from this screen:

[Add]	The Add Location screen is displayed.
[View/Modify]	Use the cursor keys to highlight the location you want to view or modify. Press <Spacebar> to select the location. Press [View/Modify] to display the View/Modify Location screen.
[Delete]	Select the location you want to delete with the cursor keys. A new set of softkeys is displayed. See page 3-28.

[Print Network Data]   This action prints location site information from the network data base. Ensure that the printer is on-line before making this selection. See page 3-29 for details.

[Exit]   The Network Administration menu is displayed.

CAUTION

Changing the network data

If you plan on altering the network data fundamentally, such as by changing location codes or by adding or deleting locations, you should do so after hours when users are not logged on. Otherwise, users may may not be able to log on or will not be able to compose messages to affected mailboxes. It is recommended that you carefully plan network sites and locations before installation to avoid changing the configuration.

Adding satellite locations to a hybrid network

The same Add Location screen that is used to add the prime location is also used to add satellite locations to your NMS network.

To access the screen, press [Add] on the List Locations screen. You are first prompted to enter a location number (in the range 1 to 59). It is recommended that location numbers be assigned in ascending numerical sequence. The Add Location screen is displayed when you have entered a number and pressed <Return>.

Figure 3-9 shows a sample datafill for a satellite location in a Hybrid network. Refer to the section "Adding the prime location to a hybrid location" for field descriptions.

Figure 3-9
The Add Location screen for a satellite location in a hybrid network

```
                         Network Administration
   View/Modify Local Location

   Location number:  1
   Location name:    satellite_____

   Dialing plan:     ESN HYBRID
   Max number of digits in local mailbox:       4_

   ESN access codes:       6__          ___
   Number of overlapping digits between ESN prefix and local ext:        0_
   ESN prefixes (they must begin with 6):
   6431_____   _____   _____   _____   _____
   _____   _____   _____   _____   _____


   Number of overlapping digits between CDP steering code and local ext: 10
   CDP Steering Codes:
     1:75_____   2:_____   3:_____   4:_____   5:_____

                                                              MORE BELOW


       Save            Cancel                     More CDP        Voice
                                                   Fields
```

Note: See the "Voice administration" chapter in the System
Administration Guide for more detailed information about adding service
DNs.

Recording location names using the [Voice] softkey

[Voice] is displayed on the Add Location and View/Modify Location
screens, allowing you to record spoken verifications for NMS locations.
The recording you make is played to identify the location when users
compose messages to or receive messages from the location.

When [Voice] is pressed, a new set of softkeys is displayed. These provide
recording functions such as Play and Record. You can also delete an
existing verification and then disconnect when you are finished. When you
record a verification, the *Location name Recorded (Voice)* field that appears
on the Add Location and View/Modify Location screens is set to Yes.
When there is no recording, this field is set to No.

Note: A telephone set is required to record the location name. Ensure
that a phone set is available near the administration terminal where you
are working.

Figure 3-10
Location name recording softkeys

| Return | Play | Record | Delete | Disconnect |
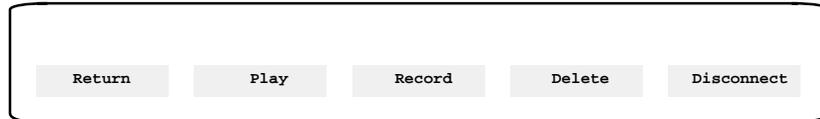
Procedure 3-5
Recording location names

Starting point The Add Location or View/Modify Location screen.

1 Press [Voice].

   *The following softkeys appear: [Return], [Play], [Record], [Delete] and
   [Disconnect]. The prompt "extension number" appears*

2 Enter the extension number of the phone set you are going to use to
   record a spoken name.

3 To record a new spoken name, go to step 3a.
   To play an existing verification , go to step 3b.
   To delete a verification, go to step 3c.
   To return to the original set of softkeys, go to step 3d.

   a. Pick up the handset of the phone and then press [Record]. Wait for
       the beep and record the location name. When you press [Record] ,
       a new [Stop] softkey appears. Press [Stop] to stop the recording
       when you are done.

   b. Pick up the handset of the phone and press [Play].

       If a verification is recorded, it will be played over the phone.

   c. Pick up the handset of the phone and press [Delete].

       *If a verification was recorded, it will be deleted and a prompt will be
       played advising you that the recording was deleted.*

   d. If you are satisfied with the recording, press either [Disconnect] or
       [Return] to display the original softkeys.

       *When you use [Return], the line is not disconnected (unless you
       hang up the receiver). This means that if you decide to re-record or
       listen to the recording, you do not have to re-enter the telephone
       extension after pressing [Voice].*

       *When you use [Disconnect], the line is disconnected and if you
       press [Voice] to access the recording softkeys again, you will have
       to re-enter the telephone extension.*

Viewing and modifying locations

Once you have added locations to the NMS network, they can be modified from the View/Modify Location screen. This screen is identical to the Add Location screen. It is displayed when a location is selected in the List Locations screen and [View/Modify] is pressed. Field descriptions are in the sections that describe how to add the prime location (to either an ESN network, CDP network or Hybrid network).

Procedure 3-6
Viewing and modifying locations

Starting point   The List Locations screen

1   Move the cursor to the location you want to view or modify and press <Spacebar> to select it.

2   Press [View/Modify].

   The View/Modify Location screen appears.

3   Move the cursor to the field you wish to modify; make the required changes.

4   Press [Voice] to record a spoken name for the location (if required).

   See "Recording location names using the [Voice] softkey" later in this chapter.

5   To exit the screen, press [Save] to save the additions and changes you have made or press [Cancel] to discard any changes you have made.

   The List Locations screen is re-displayed.

Deleting locations

Locations associated with remote sites are removed from the network database from the List Locations screen. When you select a location and then press [Delete], a new set of softkeys is displayed.

Messages that have been sent but not delivered to a location that has been deleted are returned with a non-delivery notification (NDN).

Note 1: Before deleting a satellite location, you must delete all users and distribution lists associated with that location. If you do not, you will not be able to delete the location.

Note 2: You cannot delete the prime location.

Figure 3-11
The Delete Location softkeys
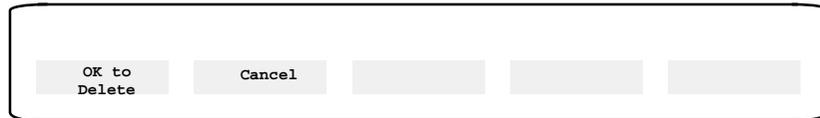
Procedure 3-7
Deleting locations

Starting point   The List Locations screen

1   Use the cursor keys to move to the location you want to delete and then press [Delete].

The Delete Location softkeys appear.

2   To delete the location, go to step 2a.
To cancel the delete operation, go to step 2b.

a.   Press [OK to Delete].

The system purges the location and you are returned to the List Locations screen.

b.   Press [Cancel].

The location is not purged from the network database. The List Locations screen is re-displayed.

Printing network data

[Print Network Data] on the Network Administration menu allows you to print the location information that is stored in the database.

Procedure 3-8
Printing location information

Starting point   The List Locations screen

1   Ensure that the printer is on line.

2   Press [Print Network Data].

   The network data is printed. The menu prompt reappears when the printing is completed.

3   Press [Cancel] at any time to stop printing. The printing will stop at the end of the current location entry.

Testing the network

Following your initial configuration of the prime location and satellite locations, add a few users to each of the locations and then test the network to ensure that all features work. Enable autologon for some or all of the mailboxes so that you can test this feature. See the section "Adding users" in the "User administration" chapter in the *System Administration Guide* for details. Note that users at other NMS locations are considered local voice users.

To verify the set up, dial each of the Voice Messaging DNs on each of the switches in the network. This can be done from any phone set in the network by dialing the full ESN or CDP number of the Voice Messaging service. In each case the Voice Messaging service should be reached.

By using phone sets at each location, test the following:

1   Try logging on to Meridian Mail from a phone set that has autologon enabled.

2   Try logging on to Meridian Mail from a phone set that does not have autologon.

3   Log on to Meridian Mail and then try to thru-dial to an extension on another switch in the network.

4   Leave messages in a number of the mailboxes at each location.

5   Check that the MWI lamps have been activated in each case.

6   Call into the mailbox, read the messages and attempt Call Sender operations.

If the number presented to Meridian Mail is not in the expected format, the SEER `Non-user forwarded to VM. MBox: nnnnnnn` is generated. The number `nnnnnnn` represents the digits received from the Meridian 1 (in the case of an ESN number, the ESN access code will not be shown). In this situation, you may take one of three actions:

1   If the number is a user extension, and the user's mailbox really exists, check the user's profile (select User Administration from the main menu and view the local voice user). Verify that one of the three extension DNs matches the received digits. For users that belong to satellite locations with ESN numbering plans, ESN prefixes must begin with the ESN access code of the *prime* switch.

2   If the number is a service, access the VSDN table (in Voice Administration). Ensure that the DN configured for the service is correct. For services at satellite locations, the DN should be in network (ESN or CDP) format. If the dialing plan for the satellite location is hybrid, the DN should be in ESN format.

3   If the extension DN was correctly defined for the user, then check that the network parameters have been configured correctly. Specifically, check that the numbering plans selected for the prime and satellite locations are consistent with the numbering plan used on the Meridian 1. Also check that the first ESN access code in the prime location screen is the same as the access code prefixing an ESN extension number in the User directory entry.

Chapter 4: Really understanding NMS

Introduction

NMS-MM feature operation is transparent to the network users. Therefore, it is similar to the existing feature operation. This section only covers those features that are impacted by the NMS-MM feature.

NMS-MM features

Users from a satellite Meridian 1 switch which is part of the NMS-MM network will have access to all the features available to the prime switch. The feature operation is transparent to the users at the satellite switch as well. Currently, MM server supports either end-to-end signaling (EES) or AML/CSL key (digit) message for accessing MM features. For NMS-MM, EES is required from a satellite switch; AML/CSL KEY (Digit) message will not be supported in NMS-MM because user is at a satellite switch.

For each function, ISDN messages are being exchanged between the satellite and prime switch while AML/CSL messages between prime switch and MM server. In the following sections, the existing AML/CSL messages affected by the NMS-MM operation and the messaging exchange sequence involved in the above three functions are described in more details. AML messages can be monitored using overlay 48 in the Meridian 1. (See NTP 553-3001-400 for more information.)

Direct NMS-MM access

1   Assume that MWI at user A station is on. User A has the following options to login the MM to retrieve his/her messages:

   • The user may dial NMS-MM network DN at the home or any of the satellite Meridian 1 switches to connect to the MM server. In this case, the user will be required to enter his/her the location prefix and full mailbox address in order to log into MM server.

- The user may gain access to NMS-MM by dialing his/her local MM DN to connect to the NMS-MM server, the call will be redirected to the MM server using ACD Night Call Forward DN for the ACD queue involved. User A logs on by pressing <#> (auto-logon from his/her own station) or entering mailbox number, pressing <#>, then entering password.

- The user may press the message waiting key (MWK) at the station set, if available, to connect to the MM server. The login procedure is dependent upon the DN assigned to the MWK. If a network DN is assigned, then the network DN login procedure is required. Otherwise, the local Meridian Mail DN login procedure is requested.

2   User A presses the respective keypads in the station set to initiate the MM corresponding features.

3   User A is disconnected from NMS-MM.

4   User A returns to idle.

Direct NMS-MM access is initiated by an user dialing MM DN, either on a per switch or a network basis to retrieve messages or to compose/record messages. If user chooses to dial his/her local MM DN to access the MM server, the configuration described below is required in each switch.

- Configure a "dummy" ACD group with no agents in it.

- The call will be always redirected to Night Call Forward DN which has the real network Meridian Mail's ACD DN entered. Please refer to "Configuring Meridian 1 for network messaging services" in this chapter.

Message sequence

- When NMS-MM access is attempted from a satellite switch, an AML/DIAL PCI message will be sent to present the call to the MM.

- If the MM is ready to receive the call, an AML/DIAL Incall KEY message will be sent from the MM to the prime switch.

- After the connection between the Meridian 1 to the MM is made, a FACILITY message with TCAP protocol will be sent to the satellite switch to indicate the activation of the voice messaging service. This is used as an indication to display the voice messaging feature softkeys in a digital set such as M2317 or M3000 sets.

- Meanwhile an AML/DIAL ANS message is sent from the prime switch to the MM to indicate the path between the Meridian 1 and MM is successful made.

- DTMF End-to-end signaling is transmitted to MM for feature activation.

- Disconnect sequence can be initiated by either user or MM as usual.

Figure 4-1 illustrates this message sequence.

**Figure 4-1**
Direct NMS-MM access message sequences
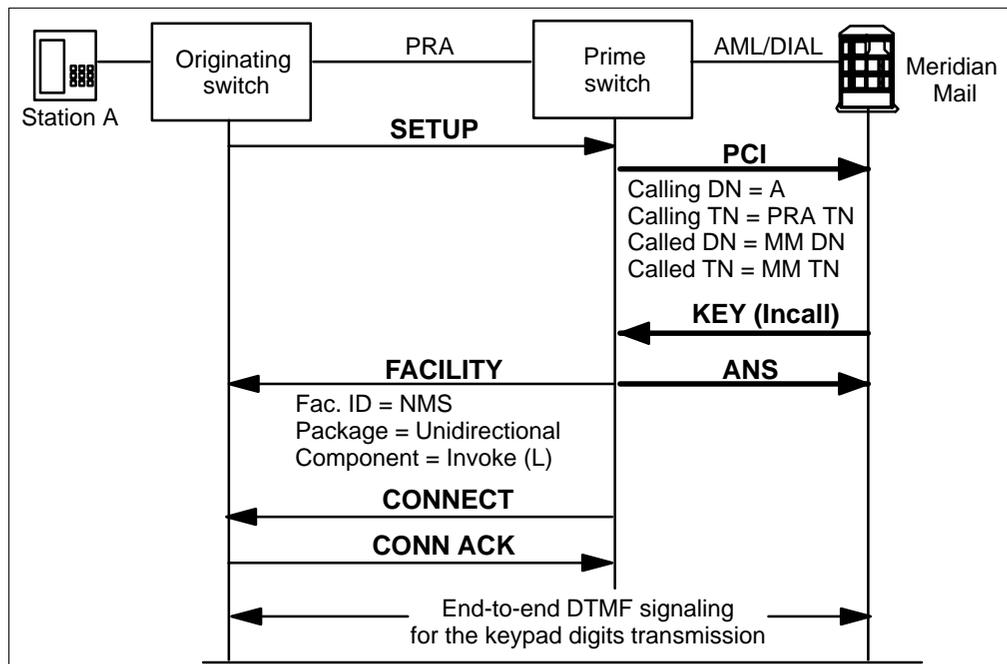
Indirect NMS-MM access

1   User A calls user B.

2   Call is redirected to MM server.

3   Call is presented to the NMS-MM. After user A leaves a message, the MWI is turned on at user B station.

4   User A is disconnected from NMS-MM.

5   User A returns to idle.

Indirect NMS-MM access is a call being redirected to NMS-MM for call answering service. This service will allow users on the satellite or prime Meridian 1s in the ISDN network to receive messages by having their calls answered by MM. The message sequence is the same as the direct access. Figure 4-2 shows the message sequence for indirect access testing.

Figure 4-2
Indirect NMS-MM access message sequences
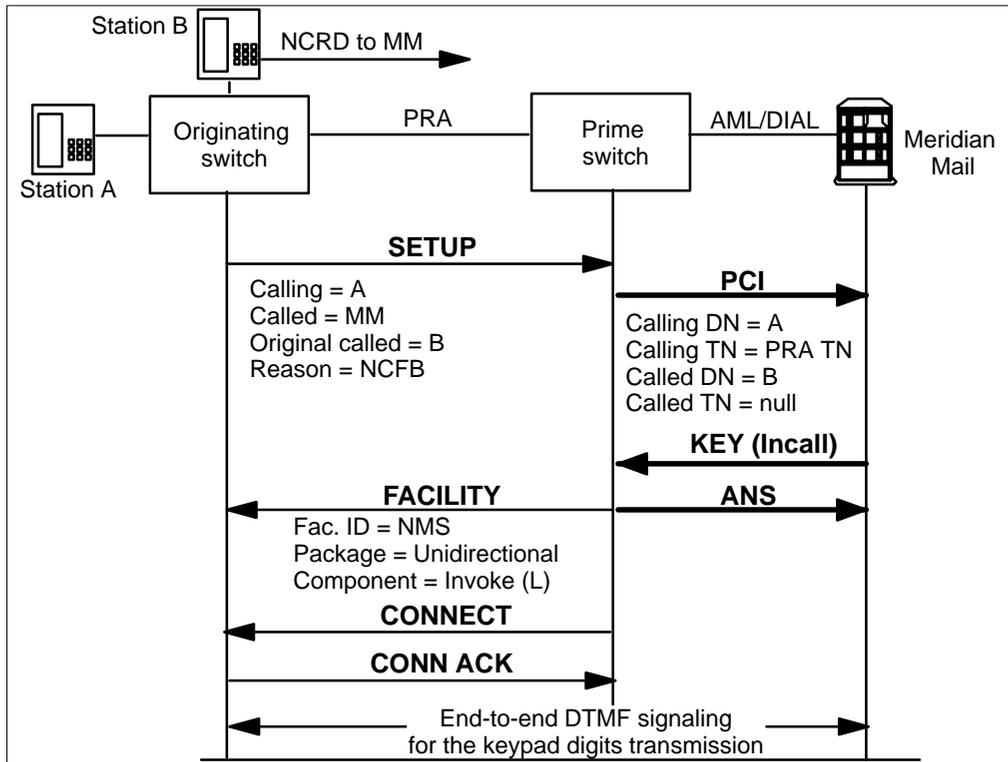
MWI notification

At the user station, there are two types of message waiting indication, visual and audible ones, to notify the user that he/she has message(s) waiting in the mailbox. For visual indications, the user can recognize the message waiting status of the mailbox by the state of the LED/LCD. (For example, when the LED/LCD is lit, this indicates that at least one message

has been deposited in the mailbox.) For audible indication, a special tone is heard (typically a stuttered dial tone) when the user lifts the handset.

- At the time that NMS-MM wishes to cause a user's message waiting indication to be activated or updated, NMS-MM will send a AML/DIAL MWI message with on/off indication to the prime switch.

- If the user is at a satellite switch, an ISDN FACILITY message with TCAP protocol will be sent to the satellite switch to turn on/off the message waiting indication at the remote user's set.

- A 4-second timer is started when the FACILITY is sent to the satellite switch.

- A FACILITY message is responded from the satellite switch before the timer expires to confirm the MWI operation is successfully completed.

- The MWI notification session is completed with success.

- If there is no confirmation FACILITY message received before the timer expires, or a FACILITY REJECT message is received due to database inconsistency, a MWI message will be sent to the NMS-MM server to indicate the failure of the MWI operation. The failure reason sent back to MM server could be one of the reasons listed below:

  — Invalid DN

  — NMS application is not supported in the satellite switch.

  — D-channel link failure

  — Verify if the MWI failure is in the Meridian 1 or Meridian Mail

    To do this

    1   Program the prime switch or assign an MIK key and an MCK key to the prime location switch phone. This is done in overlay 11. Respond to the prompts as follows:

REQ	CHG	
TYPE	xxxx	Telephone type (for example, 2317).
ECHG	YES	
ITEM	_KEY_x_MIK	Message Indication key, where x is the Key #
ITEM	_KEY_x_MCK	Message Cancellation Key, where x is the key number.

2   Ensure that a satellite switch phone has an MWI indicator.

3   Have the prime switch telephone activate MWI at each satellite location.

    a.   Press the MWK key.

    b.   Enter the DN of the satellite phone.

4   If the MWI lights at the satellite location, the Meridian 1 is not at fault. MWI can be extinguished using the MCK of the prime location phone.

    If the MWI lights at each satellite location, check the Meridian Mail database for correct programming. (For example, check the user profile through User Administration and the satellite location configurations in Network Administration.)

5   If the MWI does not light, check the Meridian 1 database as outlined in the section "Meridian 1 configuration" earlier in this chapter.

Figure 4-3 shows the message sequences for a successful MWI notification. Figure 4-4 shows the message sequences for an unsuccessful MWI notification.

Figure 4-3
Successful MWI notification message sequences
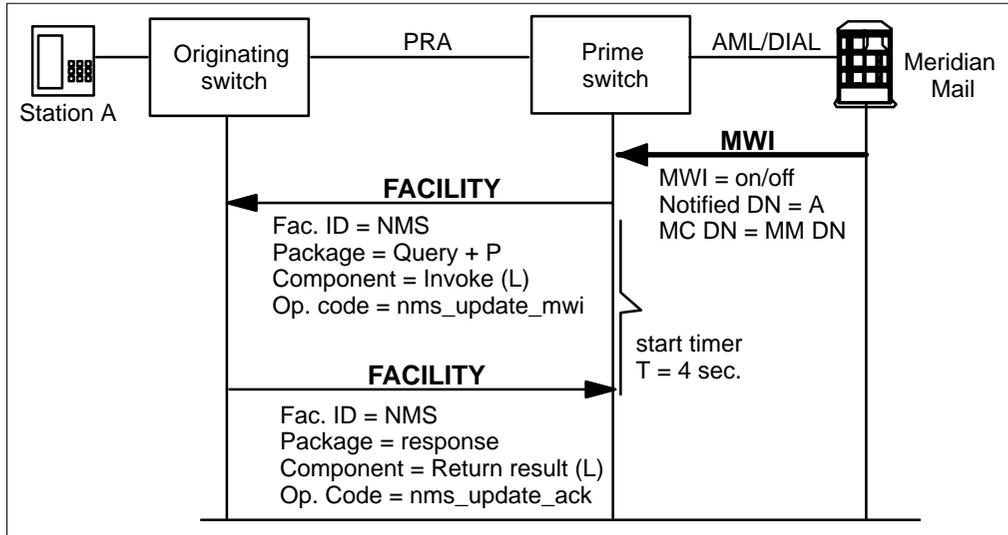
Figure 4-4
Unsuccessful MWI notification message sequences
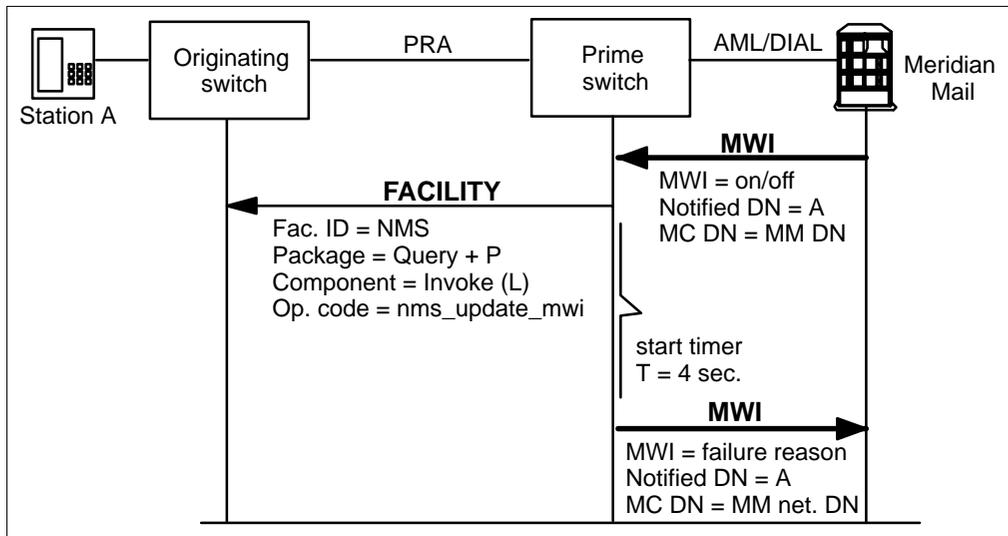
Call Sender

While reviewing mailbox messages, a user can invoke the Call Sender feature to automatically call the sender of the message he/she is reviewing. At this point, the voice connection to the NMS-MM is put on hold and the users is connected to the sender that left the message.

1   When the user is calling from an on-net extension to activate Call Sender feature, a new call will be placed from the switch where the user resides to the sender's station using the conference key feature of the user's station while put the connection between user and MM on hold. This will allow the user to revert to MM if he/she wishes.

2   After the Call Sender feature is activated, one of the following situations may occur:

     — A three-way conference is activated among user, sender and MM after the user presses the CONF key at the station set.

     — User will get back to the MM after the sender disconnects

     — The connection between MM and user A is dropped after the MM times out while the conversation between user and sender continues.

3   When the user is calling from an off-net location to retrieve his/her messages, the call will be transferred from the MM voice channel to the sender's station. This will not allow the user to revert to MM once the transfer is established.

4   For messages left by senders at off-net location, Call Sender feature will not be supported in this release. However, if a public format D is available, it will be announced to the user when the message envelope is read.

Figure 4-5 illustrates the message sequences for on-net Call Sender. Figure 4-6 illustrates the message sequences for off-net Call Sender.

Figure 4-5
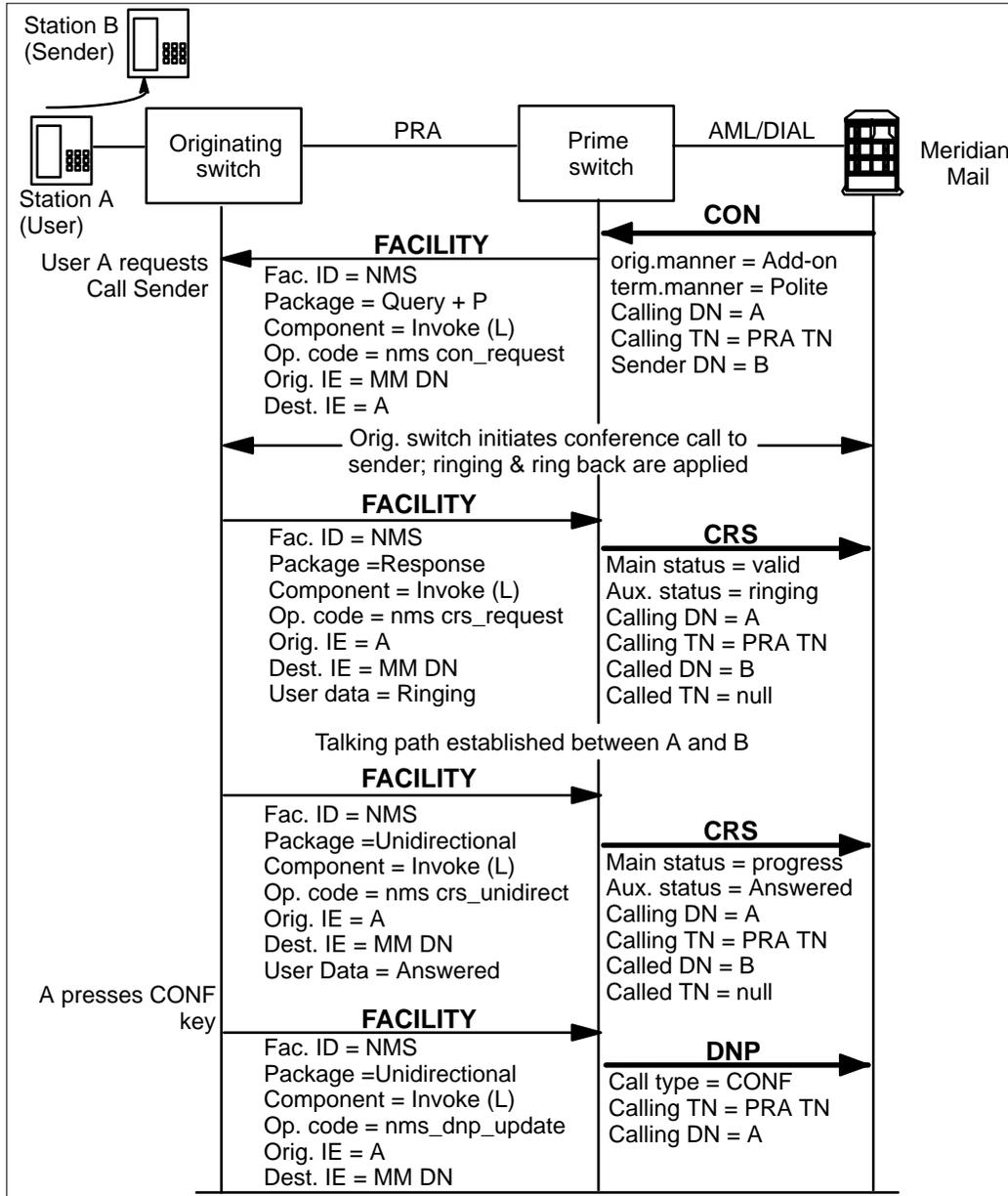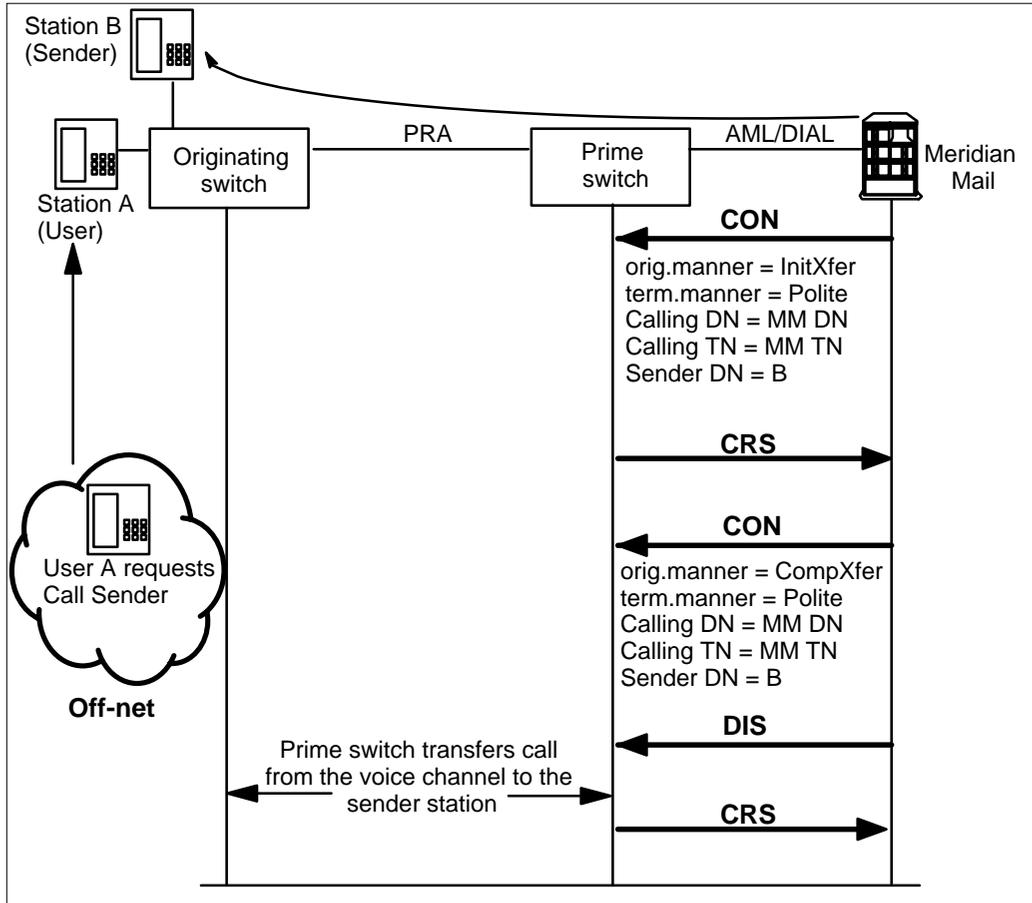**On-net Call Sender message sequences (an example)**

Station B
(Sender)

Station A
(User)

Originating
switch

PRA

Prime
switch

AML/DIAL

Meridian
Mail

CON
orig.manner = Add-on
term.manner = Polite
Calling DN = A
Calling TN = PRA TN
Sender DN = B

User A requests
Call Sender

FACILITY
Fac. ID = NMS
Package = Query + P
Component = Invoke (L)
Op. code = nms con_request
Orig. IE = MM DN
Dest. IE = A

Orig. switch initiates conference call to
sender; ringing & ring back are applied

FACILITY
Fac. ID = NMS
Package =Response
Component = Invoke (L)
Op. code = nms crs_request
Orig. IE = A
Dest. IE = MM DN
User data = Ringing

CRS
Main status = valid
Aux. status = ringing
Calling DN = A
Calling TN = PRA TN
Called DN = B
Called TN = null

Talking path established between A and B

FACILITY
Fac. ID = NMS
Package =Unidirectional
Component = Invoke (L)
Op. code = nms crs_unidirect
Orig. IE = A
Dest. IE = MM DN
User Data = Answered

CRS
Main status = progress
Aux. status = Answered
Calling DN = A
Calling TN = PRA TN
Called DN = B
Called TN = null

A presses CONF
key

FACILITY
Fac. ID = NMS
Package =Unidirectional
Component = Invoke (L)
Op. code = nms_dnp_update
Orig. IE = A
Dest. IE = MM DN

DNP
Call type = CONF
Calling TN = PRA TN
Calling DN = A

Figure 4-6
Off-net Call Sender message sequences (an example)

Thru-Dial

Callers into NMS-MM Call Answering or Voice Messaging who wish to dial another extension without first hanging up can use the thru-dialing feature to place a call by keying 0 followed by the desired number. The thru-dialing operation will cause a call transfer to take place from the voice channel of the MM server to the specified DN. The same scenario will apply to operator revert, Auto-Attendant and Voice Menu as well.

1   After the MM is accessed, the user who wish to dial another extension without first hanging up can use the Thru-dial feature to place a call by keying 0 followed by the desired number.

2   Thru-dial to an off-net DN will only be achieved if the DN can be dialed from the prime switch. Therefore, following options can be applied to the offnet access:

—   All off-net number entered by the administrator must be a valid DN that can be dialed from the prime switch, including public numbers. This applies to operator revert DNs, and so on

—   In general, thru-dialing DNs entered by the users to off-net destinations will not be supported in this release because the caller may not be entering the numbers with respect to the prime switch where the call is transferred from. However, the call attempt will still be made. If the number provided from the user is can be dialed from the prime switch, the call will successfully be made.

—   The off-net access can be blocked using Voice Security Options provided in the MM server.

Figure 4-7
Thru-dial message sequences (an example)
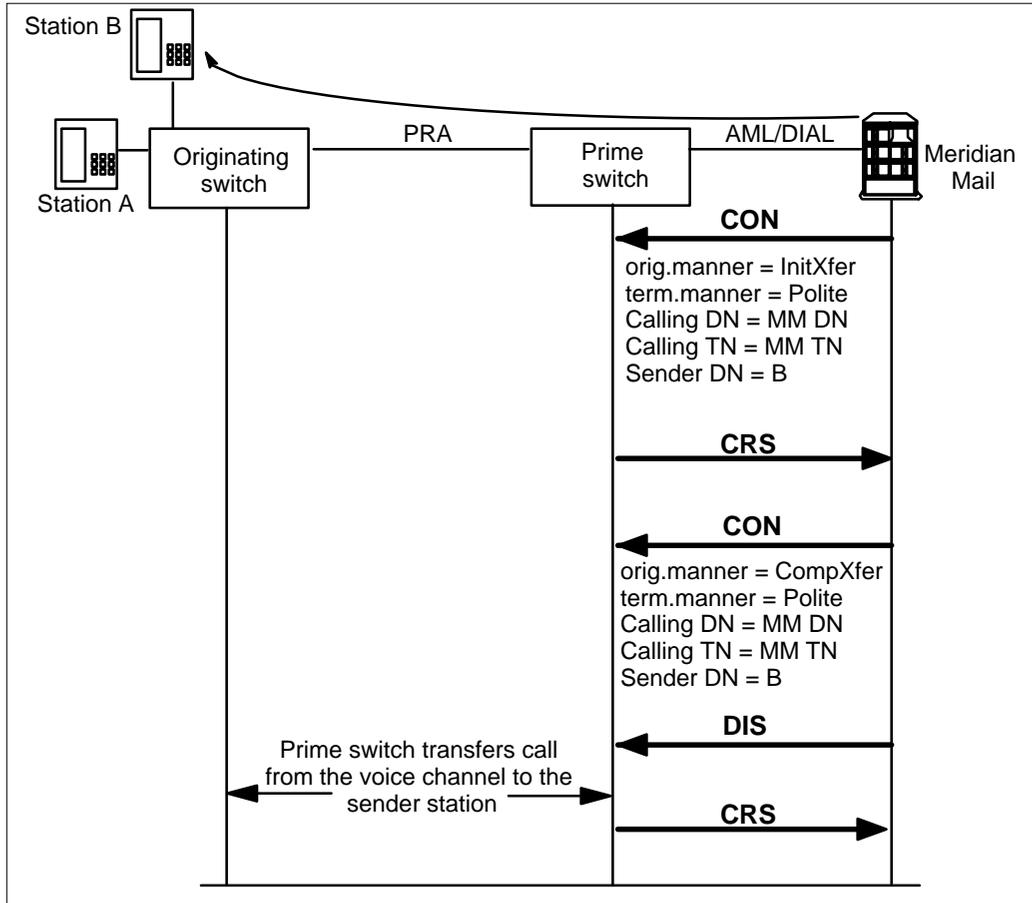
Abnormal operation

In the event that AML/DIAL link between the MM and prime Meridian 1 is failed, the call can be redirected to an alternate D. AML/CSL Recovery Enhancement developed in Release 16 ensures that callers to Value Added Servers associated with an ISDN AP are redirected to the Call Forward DN (NCFW) for the ACD queue involved.

If the MWI message is lost due to D-channel link failure or rejected by the satellite switch due to inconsistent database, a MWI message with the failure reason will be sent to MM server to inform the failure operation. MM will then notify the administrator with error through the console. An audit may be performed every nigh in MM server to synchronize user's mailbox with the MWI indication.

Chapter 5: Troubleshooting

Overview

Methods used to troubleshoot and maintain NMS are the same as those used for general Meridian Mail maintenance. System error event reports (SEERs) and Meridian 1 error codes are the main tools used in maintaining the Network Message Service.

Operational measurements are another indication of how well the service is operating. However, there are no special NMS-based operational reports. Reports include the sum of all NMS activities, such as incoming calls. Messages composed are not separated out by location.

Meridian Mail NMS error messages

The following are NMS-related SEERs as described in NTP 555-7001-510.

SEER 2217 Call Sender call not established, Mbox:752842 RC:9

Cause:	This SEER shows that Voice Messaging (VM) has encountered a problem with the Call Sender feature.
Impact:	The user will hear an error prompt.
Action:	Look for Return Code (RC) under "Call Progress Status" and "Supplementary Information."
RC:	Call request is rejected, receiving reorder tone. Access restricted.

SEER 2217 Reason not established and DN called,Mbox:2382 RC:8

Cause:	This SEER indicates the reason for call failure is not established.
Action:	Look for Return Code (RC) under "Call Progress Status" and "Supplementary Information."

RC: Call party is busy.
Blocked due to no resource.

SEER 2217 GTI login failed, Mbox:2927 RC:2811

Cause: This SEER indicates that the login was incorrect.

Impact: VM will continue to try the call but the call will be treated as if the link were not AML/DIAL.

Meridian I/SL-1 messages

Meridian 1 error messages will pop up at the prime and/or satellite sites. Here are some examples of error messages called ERR codes. When the call processing software detects information which is not in the correct format or when invalid information is detected, an ERR message is printed. See the *X11 Input/Output Guide*, NTP 553-3001 400, for details.

ISDN maintenance messages are similar to those that are generally found in the Meridian 1 database. Details about these are given in this module, so that you will be able to easily identify an ISDN message if a problem occurs.

Error messages

ERR5015: D-Channel is interfacing with a software issue not supported by the application.

ACTION: Check the RLS and IFC prompts in LD 17 for the specified DCH (only IFC SL1 and RLS 16 are supported).

ERR5057: The D-Channel interface for routing NMS FACILlTY messages is not an SL-1 interface.

ACTION: Check the IFC prompt.

ERR4080: D-Channel was not found for sending a Facility message

ACTION: Check if Route Choice is PRA/ISL or not.

ERR4081: A FACILlTY reject message was received. Destination digits cannot be translated at the other end.

ACTION: Check the translation/routing setup at the other end.

ISDN maintenance messages

ISDN capability is maintained in the Meridian 1 database in much the same way as the other parts of the database are maintained. Maintenance messages provide satellite and prime switch status. Three types of messages may appear:

- in-service

- maintenance

- out-of service

Maintenance messages are activated in overlay 96 on a per D-channel basis. See NTP 553-2901-500 for details.

Examples of ISDN messages are given below.

DCHI maintenance messages DCHxxx

DCH1009: PRI reported DCHI is out of service

ACTION: 1. Check DCHI status

2. Check PRI status

3. Check the PRI-to-DCHI cable

DCH1013,1014: Invalid DCHI state

ACTION: 1. Disable and re-enable DCHI card

2. Check DCHI status

PRI maintenance messages DTAxxx DTLxxx PRIxxx

DTA001: Data block is not defined

ACTION: Define data block

PRI1004 L   PRI not ready and DCHI not ready

Clock controller messages DTCxxx

DTC003: Clock controller cannot be accessed

List of terms

Full mailbox number

The *full mailbox number* is a user's local mailbox number prefixed by all necessary location identification digits.

Local mailbox number

The *local mailbox number* is the same as the Meridian 1/SL-1 directory number that is configured on the DMS/SL-100 (if mailbox numbering follows the dialing plan in the Meridian 1/SL-1).

Local site

The *local site* refers to all of the locations served by the Meridian Mail server.

Location

A *location* is a logical representation of mailbox numbers that may reside on a single switch or that may be spread out across a number of switches.

Network format

Network format indicates that any necessary location codes, such as a CDP steering code or ESN prefix, must be included when entering a user's address or a VSDN. In the case of ESN, the prefix includes the access code of the *prime* switch and the routing prefix of the satellite location.

Prime location

The *prime location* is the location representing the prime switch. Users that reside on the prime switch are added to the prime location.

Prime switch

The *prime switch* is the Meridian 1/SL-1 to which the Meridian Mail server (with the NMS feature installed) is connected.

Satellite location

A *satellite location* represents one of the satellite switches. Users that reside on a satellite switch are added to the corresponding satellite location.

Satellite switch

A *satellite switch* is any Meridian 1/SL-1 in the NMS network other than the prime switch. In other words, it is a Meridian 1/SL-1 that is not connected to its own Meridian Mail server, but rather is serviced by the prime switch.

Site

A *site* refers to a Meridian Mail server and all of the switches that it supports.

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for

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Network Message Service Administration Guide,
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Guide

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