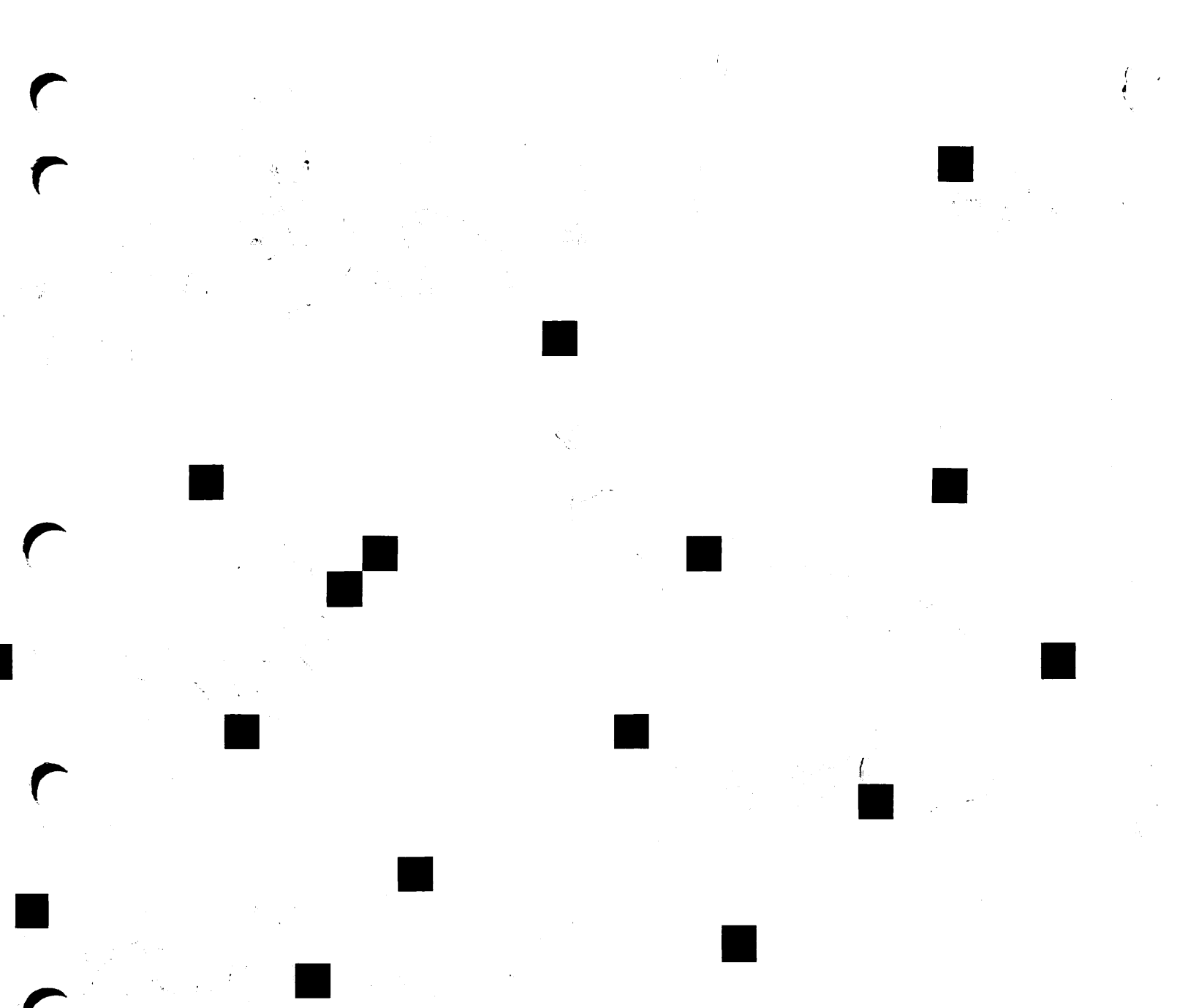

Prime®

X.400 Administrator's Guide

Release 1.1

DOC11276-1LA

X.400 Administrator's Guide

First Edition

Liz Parsons and Hugh Anstee

This book documents the use of Prime X.400 at Release 1.1, which runs on PRIMOS® Master Disk Revision Levels 21.0.3 and above, and 22.0 and above.

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CONTENTS

ABOUT THIS BOOK

The *X.400 Administrator's Guide* is a reference and guide to the administration and control of Prime X.400 on a system or network.

The guide gives an overview of X.400 protocols, introduces the product, and describes in detail how to start, stop, configure, monitor, and control Prime X.400, together with relevant examples.

Chapter Contents

Chapter 1	Introduction to Prime X.400, provides a general introduction to X.400, Prime X.400 and Prime X.400 configuration. It also describes Prime X.400 security, and introduces the operator commands.
Chapter 2	Prime X.400 Configuration, is a reference to the principles and procedures of configuring Prime X.400 on a network. It describes how to invoke the configurator using the CONFIG_X400 command, and contains details of the configurator menus and forms.
Chapter 3	Operation and Monitoring, describes the operator command ADMIN_X400, starting and stopping Prime X.400, and the display and control subcommands.
Chapter 4	CONFIG_X400 EXAMPLES, provides examples of how to configure Prime X.400 on your system or network.
Appendix A	Installation and Diagnostics, explains how to install Prime X.400, describes the PRIME_X400* product directory, and outlines how to use the error logs and journals to monitor X.400 sessions and diagnose problems.
Appendix B	Error Messages, lists and describes the hexadecimal error codes produced by Prime X.400.

Related Documentation

The companion volume to this book is:

- *X.400 Programmer's Guide (DOC11277-1LA)*

Other Prime manuals which you may find useful for reference are:

- *PRIFORMA Forms Design and Admin Guide (DOC10240-1LA)*
- *Network Planning and Administration Guide (DOC7532-3LA)*
- *Operator's Guide to Prime Networks (DOC10114-LA)*
- *System Administrator's Guide Vol. I, System Configuration (DOC10131-1LA)*

You may also find the following useful for reference:

- *CCITT Red Book Volume VIII Fascicle VIII.7, Recommendations X.400 - X.430*

Prime Documentation Conventions

The following conventions are used in command formats, statement formats, and in examples throughout this document. Examples illustrate how you use these commands and statements in typical applications.

Convention	*Explanation*	*Example*
UPPERCASE	In command formats, words in uppercase indicate the names of commands, options, statements, and keywords. Enter them in either uppercase or lowercase.	DISPLAY-USER
lowercase	In command formats, words in lowercase indicate variables for which you must substitute a suitable value.	CONFIG_X400 filename
Abbreviations in option descriptions	If an uppercase word in a command format has an abbreviation, the name and abbreviation are placed within braces.	{-HELP / -H}
Underscore in examples	In examples, user input is underscored but system prompts and output are not.	OK,display-user user=all
Angle brackets in messages < >	In messages, text enclosed within angle brackets indicates a variable for which the program substitutes the appropriate value.	<filename> not found.
Boldface	When they first appear in text, new terms are entered in boldface.	**applications**
Italics	In text, italics indicate variable user input or emphasis. Where Prime documentation is referred to in text, the title of the manual is entered in italics.	*pathname* the *default* file *Prime X.400 API Guide*
MONOSPACE	User examples and program listings are displayed in monospace.	OK,admin_x400 X400:

PART I
OVERVIEW AND REFERENCE

1

INTRODUCTION TO PRIME X.400

This chapter gives an overview of the X.400 message handling system, introduces the Prime X.400 product, and outlines the procedures for configuring Prime X.400. It also introduces user security on Prime X.400 services, and the ADMIN_X400 operator command.

Introduction

Prime X.400 is a set of communication software services which enable users of Prime systems to connect to, and interchange data with, X.400 applications on other X.25 networks. It contains the support services for all X.400 applications, and forms the basis on which electronic mail applications can be designed and built for Prime systems.

Prime X.400 implements the CCITT X.400-series recommendations for message handling systems. For details of these recommendations, refer to the *CCITT Red Book, Volume VIII Fascicle VIII.7* covering CCITT Recommendations X.400-X.430.

Overview of X.400

X.400 is a series of protocols that define a store-and-forward Message Handling System (MHS) for the exchange of messages between computer network users. It primarily addresses the requirements of electronic mail applications. X.400 is implemented in layer 7 of the OSI Reference Model, shown in Figure 1-1.

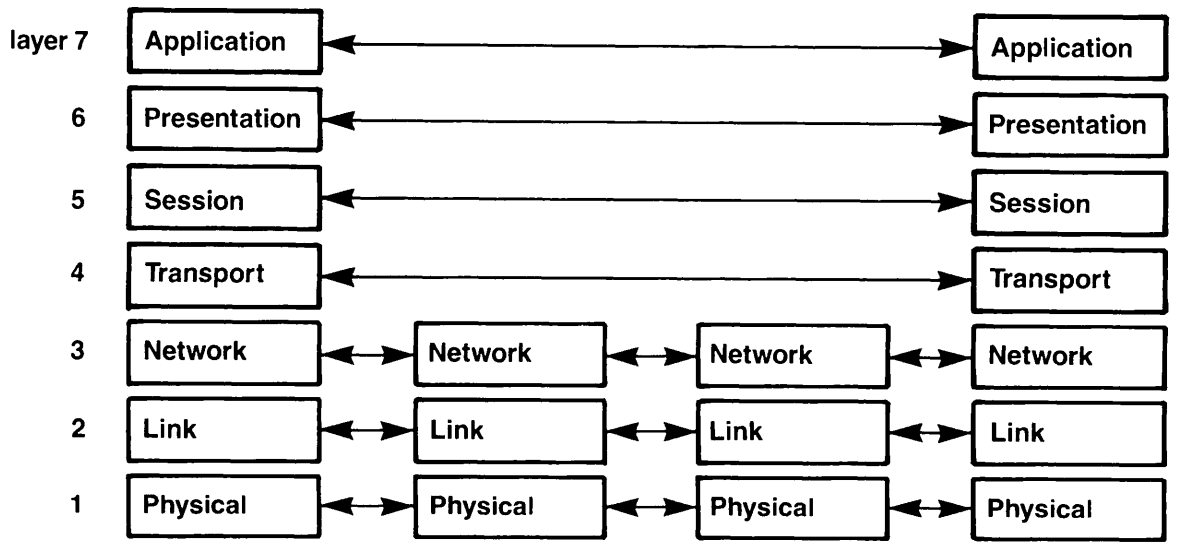

FIGURE 1-1. The OSI Reference Model

The X.400 Model

The X.400 series of definitions and protocols define a logical network model to which all X.400-compatible message handling systems must conform. The model consists of two types of software processes, known as User Agents (UAs) and Message Transfer Agents (MTAs).

User Agents provide the link between users and MTAs. UAs are processes that interact with the sender, construct messages for submittal to MTAs, and display the messages to recipients at the target node. User Agents are implemented by mail applications.

Message Transfer Agents are the store-and-forward nodes on an X.400 network. MTAs can act as relay points for the exchange of messages across a network, cooperating with each other to ensure delivery. MTAs act as the intermediaries between User Agents, determining destinations, controlling routing, delivering messages, and signalling errors.

X.400 User Addresses

Users are identified on X.400 networks by **Originator/Recipient** (O/R) Addresses. These are unique addresses assigned by network administrators, in cooperation with X.400 regulatory bodies. X.400 permits two forms of O/R addresses, as follows:

- A multi-component name
- An X.121 Address

The multi-component name is the most common form, and is used by Prime X.400. Components include the country where the network operates, the names of administration domains, organizations and organizational units, and personal names. Some components are allocated by the X.400 international regulatory bodies, some by the public service carriers in a particular country, some by suppliers of X.400 software, and some by administrators of individual networks.

For details of X.400 address components, and how Prime X.400 uses them, refer to Chapter 2, PRIME X.400 CONFIGURATION.

Prime X.400 Concepts

This section describes how Prime X.400 implements the X.400 design principles and protocols.

The Prime X.400 Logical Network

In accordance with the X.400 model, Prime X.400 consists of Message Transfer Agents that act as store-and-forward nodes for the exchange of messages over the network, and User Agents that interface with users to provide the message transfer service. User Agents are implemented using services provided by the Application Programming Interface (API).

Figure 1-2 shows the main components of the logical Prime X.400 network.

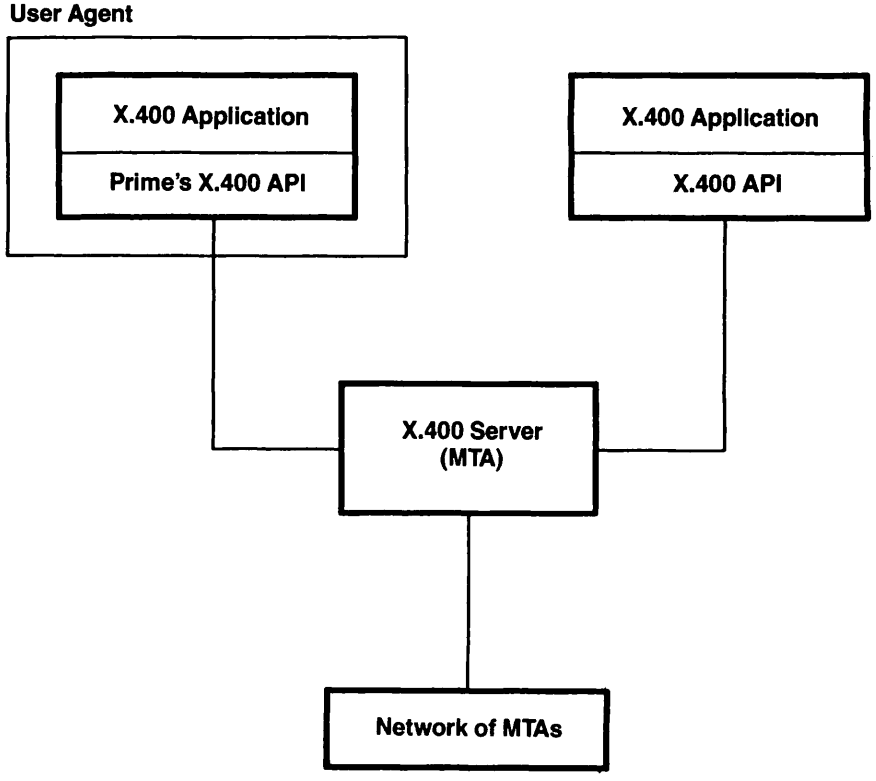

FIGURE 1-2. The Prime X.400 Logical Network

Local and Remote MTAs

Message Transfer Agents can be defined as *local* or *remote.*

Local MTAs are those that are controlled as part of one administrative unit. Typically, they would be configured on a group of systems controlled by a single administrator, such that there is no conflict of user names. Within such a unit, the administrator needs access to the Prime X.400* directories and configuration files on all systems, in order to define or modify the configuration. The administrator of the unit would be expected to have the correct level of access.

Local MTA Administrators must supply their locations on the physical network, the local passwords, the logical links, (**associations**) between local and remote MTAs, X.400 protocol parameters, and O/R addresses for local users.

The Prime X.400 configuration utility automatically inserts default values for much of the association and protocol data, so that you need only specify them if the network uses uncommon or special protocols.

Remote MTAs are defined as being on systems, or groups of systems, that are under the control of other administrators. Remote MTA Administrators must supply the network addresses, their password, some X.400 protocol parameters, and the O/R address space of remote users.

Figure 1-3 shows the association between local and remote MTAs.

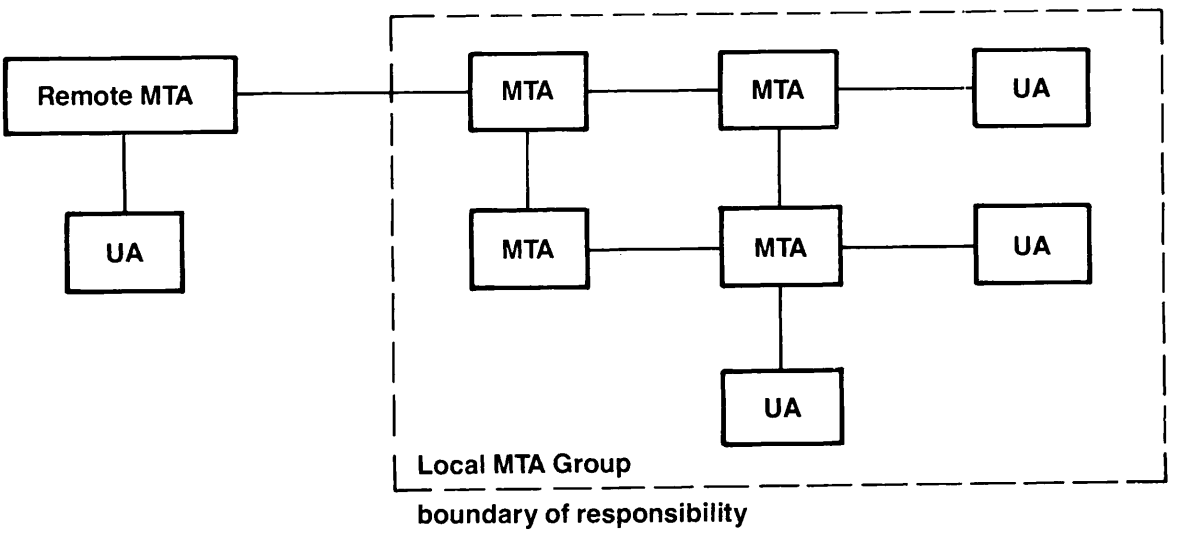

FIGURE 1-3. The Local and Remote MTA Network

Prime X.400 Configuration

Prime X.400 Configuration is the procedure the administrator uses to specify the parameters required to enable Prime X.400 to operate on the local X.25 network, and to communicate reliably with X.400 applications on other X.25 networks. It defines local and remote MTAs on a network, assigns user addresses to both local and remote users, and allows protocols to be specified, where necessary, for communicating with specific MTAs.

The CONFIG_X400 Command

The CONFIG_X400 command enables the administrator to create or modify a configuration, perform verification checks, and save the configuration, within a single terminal session. CONFIG_X400 creates a configuration file from which Prime X.400 builds its routing tables when it is started on the system.

The CONFIG_X400 command invokes an interactive environment that uses a hierarchy of selection menus and data input screens to help you define your configuration. For further details of the interactive subsystem, refer to Chapter 2, Prime X.400 CONFIGURATION, and Chapter 4, CONFIG_X400 EXAMPLES.

Control and Monitoring

The ADMIN_X400 command enables the administrator to start and stop the X400 Server, and to monitor the activity of Prime X.400 on the system. Startup and shutdown of the Server are invoked by command-line options, whilst monitoring facilities are provided within a subcommand environment, which enables the administrator to display the status of users, MTAs and message queues, and to control error message display.

For details of the subcommands, refer to Chapter 3, OPERATION AND MONITORING.

2

PRIME X.400 CONFIGURATION

This chapter is a guide and reference to configuring Prime X.400 on a network. It introduces Prime X.400 configuration and X.400 user addressing, and describes the CONFIG_X400 interactive configurator in detail, with illustrations of screen forms.

Examples of various configurations, are shown in Chapter 4, CONFIG_X.400 EXAMPLES.

Introduction

Prime X.400 Configuration is the process by which you assign MTAs to physical locations on a network, set up logical associations between local MTAs, and between local and remote MTAs, and define local and remote user addresses.

Prime X.400 configuration produces a file that Prime X.400 uses to construct its routing and directory tables which are built when Prime X.400 is started on the system.

You define configurations using the CONFIG_X400 command. CONFIG_X400 provides a screen-based interactive subsystem that enables you to define your configuration step by step, verify it for correctness, and save it to disk.

Release 1.1 Changes

Several changes have been made for Release 1.1 of Prime X.400 Configuration. The major changes are as follows:

- Revised Main Menu; `Define Alternate Recipient` is now option 7, (was option 2.1). This has resulted in renumbering of the `Verify`, `Save` and `List` options to, 8, 9, and 0 respectively.
- Option 1, `Set Local Domain`, has been renamed `Set Global Domain ID`.
- Option 4, `Configure Local Users`, has been renamed `Configure Local User Agents`.
- The ability to configure gateways has been added to both option 3, `Configure Local MTAs`, and option 4, `Configure Local User Agents`.
- The Select Local User forms, accessible via options 3 and 4, have been renamed `Select User Agents`.
- The Define Remote Domain form, accessible via option 5.1, has been renamed `Define Global Domain ID`.
- Rationalization of terms and prompts.
- Restraints and warnings added to input fields.

Configuration Data

The main categories of information required when configuring Prime X.400 are as follows:

- The number of local MTAs on your network, and the protocols under which they operate.

  You can assign MTAs to each node on the network, to a single node, or to selected nodes. However, a single node can contain only a single MTA.

- Local user addresses, and the MTAs to which they are attached.

  Each user is attached to a specific MTA, which acts as the collection and distribution point for all X.400 messages to and from that user.

A user's MTA can be the node where the user logs in, or any convenient node accessible via the local network.

- The names of remote MTAs with which you wish to communicate, protocols for communicating with them, and the user address domain that they control.

Prime X.400 Configuration Concepts

This section introduces some configuration concepts that you, the administrator, should be familiar with before configuring Prime X.400 on your system or network.

Local MTAs

As a Prime X.400 administrator, you are responsible for configuring Prime X.400 on a single node, or a group of local nodes, such as a local network, which you administer. The MTA group that you define, is known as the local MTA group.

MTAs in the same local group share a set of default attributes, such as the type of logical link (association), between them, the default address space (domain), and inter-MTA passwords.

You can only define MTAs on nodes where you have access to the PRIME_X400* directory to create and modify the configuration file. In specific terms, you must have DALURW (Delete, Add, List, Use, Read and Write) access to PRIME_X400* on the system.

As an Administrator, you must supply the required information for local MTAs. This includes their network addresses, the link type (association) between MTAs, their passwords, the service protocols and routing information, and users' X.400 addresses and MTA attachments.

Remote MTAs

Remote MTAs are MTAs on nodes outside your immediate control. They act as routes to users in other X.400 domains.

Again, as an Administrator, you must supply the information required for a remote MTA. This includes its network address, the remote and local passwords, protocols for communicating with the local MTA group, and the remote user address space (domain), associated with it.

Note

This information must be exchanged between the Administrators.

Associations

Associations are the logical connections between MTAs that comprise the X.400 network; they are the communication channels through which data transfer takes place.

Associations can be either permanent or temporary. Permanent associations are maintained at all times, even if there is a failure of the underlying network. Temporary associations are created in response to specific user requests (such as the sending of a message), and are subject to a timeout period for inactivity, but are not maintained across network failures. By default, all MTAs in a local configuration are adjacent, and are mutually interconnected by a single temporary association.

If, for example, MTA Fred was modified to show an association to MTA Bert then the definition for MTA Bert would automatically show its association to MTA Fred.

Subnetworks

Prime X.400 enables you to define sets of network data and protocols to identify networks of any type that may be encountered when connecting to other X.400 products and applications. These are known as **subnetworks.**

Subnetworks are defined separately for a particular configuration. Once the subnetwork is defined, you can identify the network protocols for a specific MTA simply by giving a subnetwork name.

When defining a subnetwork, you specify parameters for lower-level protocols in the OSI model. For brief descriptions of the parameters see Figure 2-7, and for further details consult the relevant OSI documentation.

Domains

Prime X.400 domains are X.400 name spaces through which users can be addressed. Each domain is described by a set of high-level Owner/Recipient address components (see O/R Address Components, below). Local domains are those associated with local MTAs, and remote domains are those associated with remote MTAs.

To comply with X.400 standards, the term **Global Domain ID** is used on the two screen forms associated with setting the domain. The LOCAL domain is defined using option 1, of the CONFIG_X400 Main Menu, and the REMOTE domain is defined using option 5, suboption 1, of the CONFIG_X400 Main Menu.

Gateways and Users

There are two types of Prime X.400 User Agents; users and gateways.

A user is a particular instance of a User Agent, having a single unique O/R address. Only mail addressed to that O/R address is received by the user. All mail sent by the user, is automatically labelled as originating from that O/R address.

A gateway is a route into another mail system, and shares the same name space as a user.

Gateways can have multiple O/R addresses, much the same as remote MTAs: mail for O/R addresses that have attributes matching those specified for a gateway, are sent to that gateway user. The gateway can send mail for any O/R address.

Other similarities between users and gateways, are their association with a local MTA, and the limited access to system logon IDs, for security.

Mail IDs

Every Prime X.400 User Agent is assigned a Mail ID. Consequently, as both users and gateways only support a single Mail ID, neither can have the same Mail ID. Likewise, within a configuration, all users must have a unique Mail ID, which can only be used with a single MTA.

User Agent Addresses and Address Components

Users are identified within Prime X.400 directly by unique X.400 O/R addresses (Refer to Chapter 1, INTRODUCTION TO PRIME X.400).

Prime X.400 supports the following O/R address components:

Country
Administration Management Domain (ADMD)
Private Management Domain (PRMD)
Organization
Organizational Unit(s)
Personal Name:

- Surname
- Given Name
- Initials
- Generation Qualifier

Domain Defined Attributes
X121 - Terminal ID
UA Unique Numeric ID

Full descriptions of address components are made at the pertinent points in this chapter, and also within the relevant examples, shown in Chapter 4, CONFIG_X.400 EXAMPLES.

The user address has three variants, all of which require Country and ADMD as mandatory components, plus one or more additional components. The following shows the complete breakdown of all three variants:

1. Country and ADMD plus one or more of

   PRMD
   Personal Name
   Organization
   Organizational Unit
   Domain Defined Attributes

   Note

   This is the most commonly used variant, and conforms to the X.400 standards.

2. Country and ADMD plus a UA (User Agent), Unique Numeric Identifier, and optionally Domain Defined Attributes.

3. Country and ADMD plus an X.121 Address, and optionally Domain Defined Attributes.

Prime X.400 supports all three variants, for sending, receiving and relaying mail.

Name Allocation

The Country, ADMD and PRMD components of the domain, are most likely to be set by the regulatory authorities in your country, and the public carriers to which you connect.

Country is allocated by the X.400 international controlling authorities. It represents the country in which the network operates. It can be either a three digit code as defined by CCITT X.121, or a two letter code defined by ISO 3166/ALPHA-2.

ADMD is an X.400 administrative domain within the country, for example the X.400 service provided by a public carrier. For private message handling systems that are not linked to other carriers, ADMD is not used.

PRMD is a private X.400 administration domain, and is often a company's name. If you are connecting to X.400 through a public carrier, you will probably have to negotiate the name of the PRMD with that supplier. If you are configuring a private message handling system, you should be able to choose your own PRMD name.

For example, the following set of names could be allocated to Prime networks within the UK:

Country : GB

ADMD : Gold 400

PRMD : Prime

You can define other components to suit your administrative structures.

For example, an administrator of a PRIMENET™ network on several sites could assign organization names to individual sites, leaving the administrators of those sites to define

their own organizational unit names for departments within the site. Hierarchical naming schemes of this kind are likely to be the most commonly encountered in practice, but any naming system can be used, including nonhierarchical systems.

Configuration Planning

Configuration of Prime X.400 requires some planning and forethought. This section introduces some of the issues you should address before configuring MTAs, users, and gateways on your system or network.

How Many Configurations?

Prime X.400 is configured within existing administrative units, where administrators have access to system directories, and control user access to the system. Single Prime X.400 configurations should be implemented where user names can be guaranteed to be unique. This is the recommended practice, as it avoids conflicts between mail users with the same login ID. (Refer to the previous subsection, Name Allocation.)

Multiple configurations are only necessary when the user population is large, or where user names cannot be guaranteed to be unique. For many installations, a single configuration is sufficient.

How Many MTAs?

Message Transfer Agents are the store-and-forward nodes of an X.400 network. Each MTA stores the information it needs to forward messages to the next node.

You can configure a single MTA for each PRIMENET node, a single MTA for the whole of your PRIMENET network, or any number between. If an MTA serves more than one node, you must ensure that the PRIME_X400* directory, (which contains the routing table for the node where the MTA is configured), is visible to all the other nodes served by the MTA. If you are unsure about this directory, only configure one MTA per node.

O/R Addresses

MTAs define specific addressing spaces on the X.400 network. You can configure them to suit your installation, and the mail needs of your users.

The Domain, (Country, ADMD, and PRMD), is the same for all local MTAs. Below the domain level, Organization and Organizational Unit names can be imposed by company structure or national agencies. As an Administrator, you should be aware that in some cases, the Organization Name must be the nationally-registered name of the company.

Routing

Routing in Prime X.400 is controlled by a fixed strategy. Users are matched before gateways, and components of the O/R address are tested in a fixed order, with local addresses matched first.

Routing to remote users is controlled by the National Bureau of Standards (NBS) Routing Class of the MTA. (See the Define MTA Attributes form, Figure 2-16, and corresponding explanation.)

Class 1 MTAs that can route on Country, ADMD, PRMD, and Organization.

Class 2 MTAs that can additionally route on Organizational Unit.

Class 3 MTAs that can additionally route on Personal Names. They are less likely to cause ambiguous routing, but use more storage for their routing tables.

The CONFIG_X400 Command

You configure Prime X.400 using the CONFIG_X400 command. This command enables you to create and maintain information about the Prime X.400 configuration on your network. The configuration is maintained in an ASCII file. An in-memory version of the configuration is built when Prime X.400 is started on the system.

The syntax of the CONFIG_X400 command is shown below.

▶ **CONFIG_X400** [**filename -TERMINAL_TYPE terminaltype** | **-HELP [-NO_WAIT]** | **-USAGE**]

filename

The pathname of an existing configuration file or the name of a new file to be created. If you do not specify a suffix, the suffix .CONFIG is added automatically.

To modify an existing configuration, specify an existing configuration file.

To create a new configuration, specify a filename. If the file does not already exist, a new file is created to contain the configuration.

Filename is optional. If you do not specify a filename, your configuration is written to the file PRIME_X400*>PRIME_X400.CONFIG by default.

{-TERMINAL_TYPE / -TTP} terminaltype

Specifies the terminal type you are using. Typical Prime terminal-types supported are

PT45
PT200
PT200W (132 Character wide terminal)
PT200-C (PT200 color terminal)
PT200W-C (132 character wide, color terminal)
PST100

There is no default terminal type. If you omit the terminal type, the command uses your global variable, .TERMINAL_TYPE$. If you have not set this, and the terminal type is omitted, the command aborts with an error message.

{-HELP / -H} [{-NO_WAIT / -NW}]

Explains command usage, and cancels any other options on the command line. The -NO_WAIT option stops display pagination at your terminal. The same information is available through the PRIMOS® HELP subsystem.

-USAGE Gives you the command syntax in brief.

When you invoke the CONFIG_X400 command, information about the configuration input file is displayed, as in Figure 2-1.

```
Config File: PRIME_X400*>PRIME_X400.CONFIG

Revision Number:
Last Updated   :
Updated by user:
Updated on node:

Comment:
```

FIGURE 2-1. Configuration File Information

The CONFIG_X400 Subsystem

CONFIG_X400 is a screen-based interactive subsystem through which you define your configuration step by step, verify its correctness, and save it to disk. You select options, and input data and parameters, through a linked hierarchy of screen forms that you navigate using special function keys.

The full hierarchy of CONFIG_X400 functions and subfunctions is illustrated in Figure 2-2.

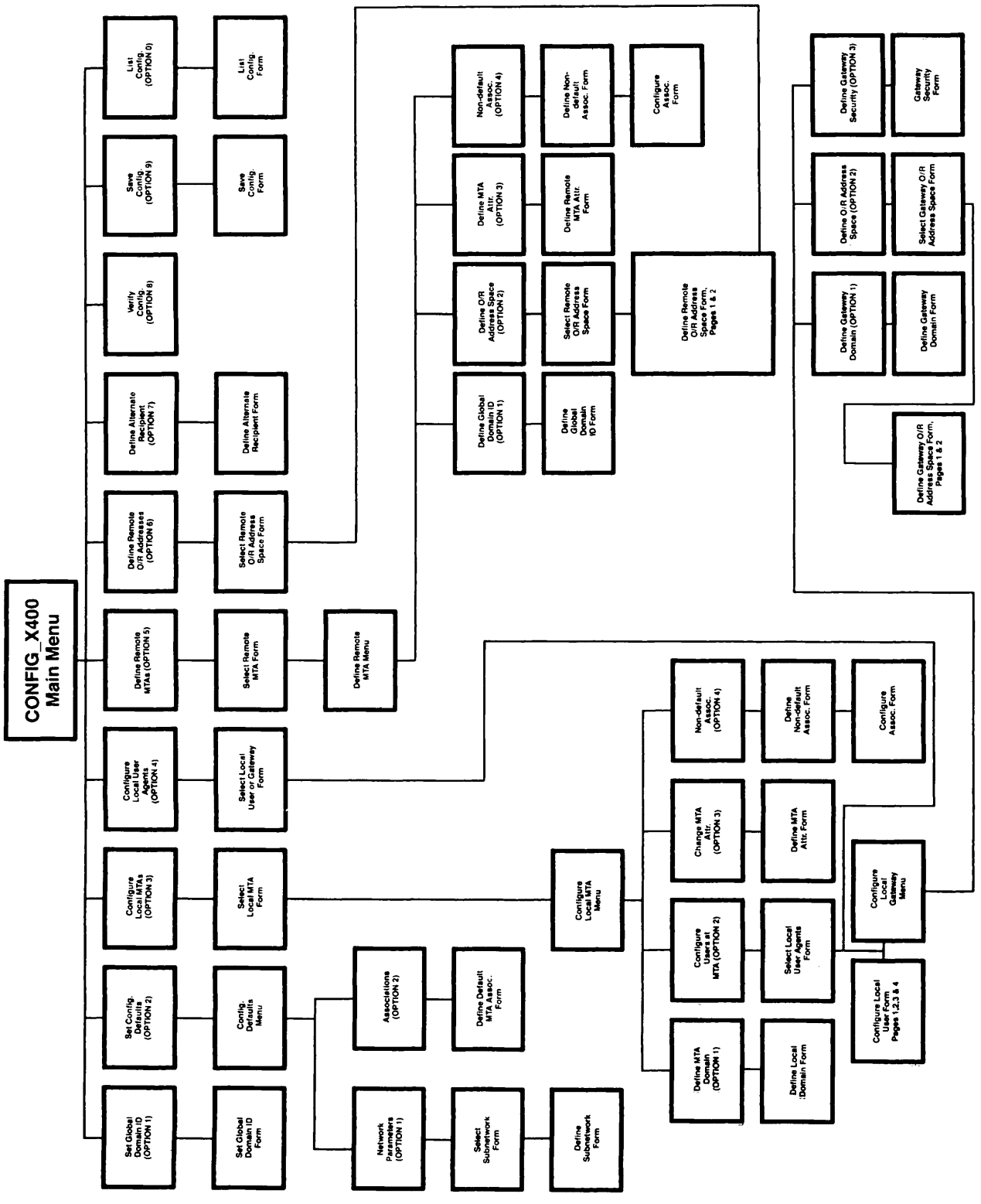

FIGURE 2-2. CONFIG_X400 Menu Hierarchy

Function Keys

Function keys allow you to perform operations such as moving between fields, selecting options, and committing changes. The functions that are available, and the keys to use to perform these functions on the PT200™ and PST100™ keyboards are listed in table 2-1.

Functions that are available on specific screen forms, and the keys that correspond to them, are also displayed at the bottom of screen.

TABLE 2-1. CONFIG_X400 Function Keys

Function	*PT200*	*PST100*	*Operation*
TAB	TAB	TAB	Move to next field
BACK TAB	Back Tab	BACK TAB	Move to previous field
TOPSCR	F8	F8	Return to main menu
TRANSMIT	Enter	PF10	Commit a change
HELP	Help	HELP	Display Help
PRINT-SCREEN	Prt Scn	Shift AUX SEND	Print screen, or write to file
EXIT	Cancel	PF14	Return to previous screen, quit program, or clear error message
ADD	F3	F3	Add a new entry to a list
REMOVE	F4	F4	Remove an entry from a list
PRVPAGE	F5	F5	Display the previous page of a multi-page form
NXTPAGE	F6	F6	Display the next page of a multi-page form
GATE	F1	F1	Add a gateway to a list

Screen Forms

There are two types of screen display: **Menus**, and **Data Input/Display forms.** To move between screens, forms, and fields, use the function keys defined in Table 2-1.

Menus, and Option Selection: Menus, such as the CONFIG_X400 Main Menu shown in Figure 2-3, consist of a list of processing options. The options are selected by either of the following methods:

- Position the cursor/highlight on the option, and press the TRANSMIT key.
- Type the number of the option you require, and press the TRANSMIT key.

Data Input/Display Forms

Data Input/Display forms consist of labelled fields where you view or specify data, such as name identifiers and protocol parameters. Fields are shown on the form by underlines, and input data is typed within the confines of the field.

In some cases, a field can be longer than it appears on the form. In this instance, when the available, visible field is full, the symbols <, and >, appear at the left and/or right of the field, respectively. This indicates that additional data may be viewed or entered. To view additional data, use the left or right arrowed cursor keys to scroll in the required direction.

The EXIT key

The EXIT key has several functions, all of which basically terminate one situation and return you to another. The EXIT key is pressed to terminate CONFIG_X400.

Typical EXIT key uses, are:

- Cancel error and operational, messages or prompts.
- Return to a higher-level menu or form.
- Abort or terminate a function.

Selecting Entries From Help Screens

Entries for some fields can be selected from Help screens. To display Help for a particular field, position the cursor on the field, and press the HELP key. Selectable entries, if available, are listed on the Help screen.

To select an entry from the Help display, position the cursor on the entry, and press TRANSMIT. Press EXIT to return to the last screen.

Default Configuration Data

CONFIG_X400 provides defaults for many Prime X.400 configuration parameters. Default values, if present, are displayed in the relevant fields.

The default parameters operate for most installations. Only change them if you have special reasons for configuring Prime X.400 in a different way.

CONFIG_X400 Main Menu

The CONFIG_X400 Main Menu lists nine selectable configuration options.

Options 1 through 7 cover categories of data that can be configured, whilst Options 8, 9 and 0 enable you to verify, save and list your configuration data.

The categories of configurable data are

- Default local domain
- Configuration defaults
- Local user addresses
- Gateways
- Non-default local domains
- Remote MTA domains
- Remote MTA attributes
- Remote user addresses
- Alternate recipient addresses

The CONFIG_X400 Main Menu is shown in Figure 2-3.

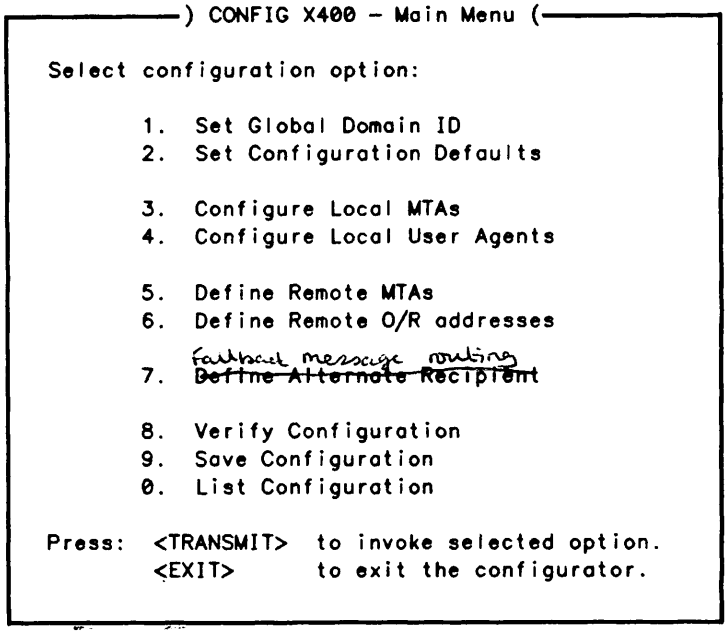

FIGURE 2-3. CONFIG_X400 Main Menu

CONFIG_X400 Option 1 - Set Global Domain ID

Option 1, Set Global Domain ID, of the CONFIG_X400 Main Menu, enables you to define the local domain name. The local domain is used as the default address space for X.400 users within your configuration, and contains Country, ADMD, and PRMD names. The addresses of all local users contain this set of names.

The domain name is also used to identify the MTA, to any remote MTAs with which it is associated.

The Set Global Domain ID form is shown in Figure 2-4. Use the TAB, BACK TAB or arrowed cursor keys to move from field to field.

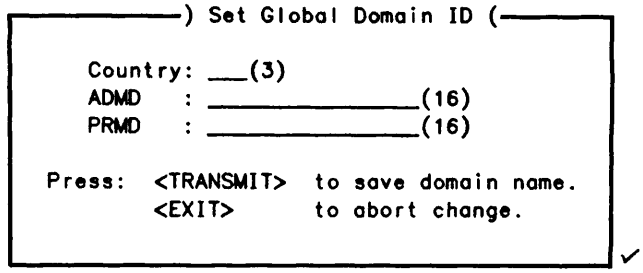

FIGURE 2-4. Set Global Domain ID Form

Define the local configuration domain by specifying Country, ADMD and PRMD.

Field	*Description*
Country	The country in which the network operates. This is defined by international regulatory authorities. Specify either: • A three-digit code as defined by CCITT X.121. (For example, the UK code is 234, the US code is 311). • A two-letter code as defined by ISO 3166/ALPHA-2. (For example, GB, US).
ADMD	The main administration domain with which you are associated. If you are connecting to a public service mail system, use the name they give you. If you are connecting to a private mail application, use a mutually agreed name, or leave the field blank. The ADMD name can contain a maximum of 16 characters.
PRMD	The private administration domain with which you wish to be associated. If you are associated with an ADMD, the PRMD may be defined by the administration of the ADMD. If you are connecting to a private message handling system, agree the name with the administrator responsible for the application. The PRMD can contain a maximum of 16 characters.

CONFIG_X400 Option 2 - Set Configuration Defaults

Option 2, `Set Configuration Defaults`, of the Main Menu (Figure 2-3), enables you to set configuration defaults. You can specify defaults for subnetwork definitions, and default associations between MTAs.

On the menus and forms that follow, select options by either positioning the cursor/highlight bar on the required option and pressing TRANSMIT, or, typing the option number and pressing TRANSMIT. Select an entry from a list by positioning the cursor/highlight bar on the required entry and pressing TRANSMIT. On Data Input forms, use the TAB, BACK TAB, or arrowed cursor keys, to move from field to field; use the TRANSMIT key to save your data.

When you select this option, the Configuration Defaults menu is displayed, as shown in Figure 2-5.

```
) Configuration Defaults (

Select option:

          1.  Network Parameters
          2.  Associations

Press:  <TRANSMIT>  to invoke selected option.
        <EXIT>      to return to main menu.
```

FIGURE 2-5. Configuration Defaults Menu

Network Parameters

Prime X.400 subnetworks are sets of protocol data and parameters that define specific subnetworks and subnetwork types.

Note

Unless you specify a subnetwork, the Network Provider is assumed to be X25, and the X25 Year, 1980, with Protocol ID of 03010100. Other subnetwork parameters are left undefined.

When you select option 2, `Network Parameters`, of the Set Configuration Defaults menu (Figure 2-5), the Select Subnetwork form is displayed, as shown in Figure 2-6.

Names of existing subnetworks are displayed in the `Select Subnetwork` column, all of which can be individually selected for modification, or removal. Use the up and down arrowed cursor keys to scroll the display. You can also elect to add a new subnetwork.

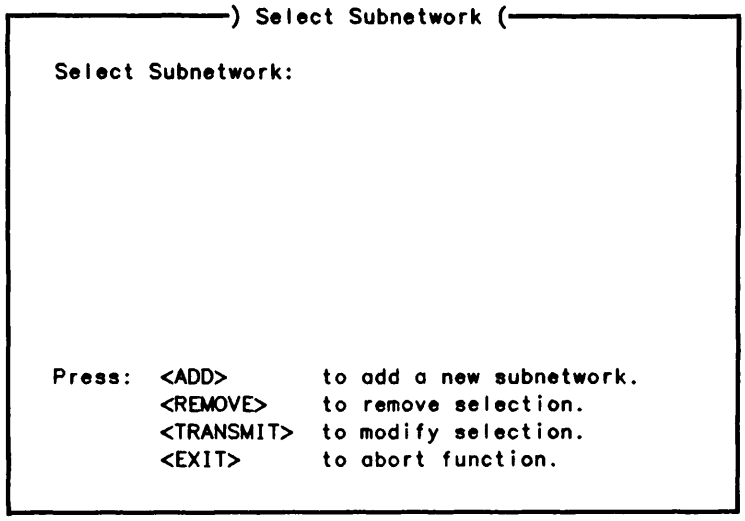

FIGURE 2-6. Select Subnetwork Form

Whether you are selecting a subnetwork to modify, or have elected to add a new one, the Define Subnetwork form is displayed, as shown in Figure 2-7. If you are modifying a subnetwork, the existing configuration data is displayed in the appropriate fields of the form.

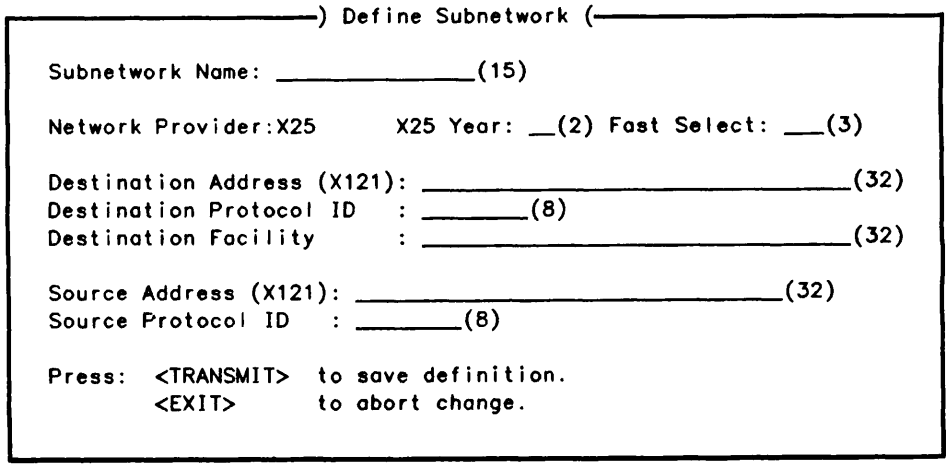

FIGURE 2-7. Define Subnetwork Form

The subnetwork definition fields are described in the following list.

Field	*Description*
Subnetwork Name	Your name for the subnetwork. Subnetwork Name can contain a maximum of 15 characters.
X25 Year	The X25 year. Enter two digits. For example, 1980 is entered as 80.
Fast Select	Selects the X25 Fast Select facility. NO is the normal and default setting. Enter YES to select Fast Select.
Destination Address (X121)	The X121 address on outgoing calls. By default, this is computed from the remote Network Service Address (NSAP). Can be entered as a PRIMENET node name, or a maximum of 15 characters.
Destination Protocol ID	The X25 protocol ID used by the remote MTA. Four bytes, entered as hexadecimal digits.
Destination Facility	The X.25 Facilities to define to make an X.25 call to the remote system which operates the remote MTA. For details of how to encode X.25 Facilities, refer to the *PRIMENET Programmer's Guide*. Destination facilities are not normally required for correct operation. Destination Facility can contain a maximum of 32 hexadecimal digits.
Source Address (X121)	The X121 address for incoming calls. This is normally the same as one of the local PRIMENET addresses. Source Address can be entered as a PRIMENET node name, or a maximum of 15 decimal digits. Source Address should be distinct from any sub-address used for PRIMENET Route-through. (Refer to the *PRIMENET Programmer's Guide).*
Source Protocol ID	The X25 protocol ID used by the local MTA. Enter as four bytes in hexadecimal format.

Associations

When you select option 2, Associations, of the Configuration Defaults menu (Figure 2-5), the Define Default MTA Associations form is displayed, as shown in Figure 2-8.

```
                ) Define Default MTA Associations (

Temporary:                    Local              Remote
   Number of Associations: ___(3)              ___(3)
   Subnetwork Name       : _____(15)____       _____(15)____
   Timeout (minutes)     : ___(3)              ___(3)

Permanent:
   Number of Associations: ___(3)
   Subnetwork Name       : _____(15)____       _____(15)____

Press:  <TRANSMIT>  to save default values.
        <EXIT>      to abort change.
```

FIGURE 2-8. Define Default MTA Associations Form

Specify the number of temporary and permanent associations for local and remote MTAs, and the name of a previously defined subnetwork.

The special name, DEFAULT, may be used to refer to the default network definition.

For temporary associations only, specify the inactivity timeout period (temporary associations are only maintained while messages are being exchanged).

The maximum number of associations that can be specified is 999.

The maximum timeout period for temporary associations is 999 minutes.

CONFIG_X400 Option 3 - Configure Local MTAs

Option 3, Configure Local MTAs of the CONFIG_X400 Main Menu (Figure 2-3), enables you to specify network addresses and protocols for local MTAs, and also configure users and gateways associated with the local MTA group.

On the menus and forms that follow, select options by either positioning the cursor/highlight bar on the required option and pressing TRANSMIT, or, typing the option number and pressing TRANSMIT. Select an entry from a list by positioning the cursor/highlight bar on the required entry and pressing TRANSMIT. On Data Input forms, use the TAB, BACK TAB, or arrowed cursor keys, to move from field to field; use the TRANSMIT key to save your data.

When you define local MTAs, you must specify the following data:

- MTA names, network addresses, routing and protocol information
- MTA attachments and O/R addresses of local users and gateways

When you select the `Configure Local MTAs` option, the Select Local MTA form is displayed, as shown in Figure 2-9.

Names of existing MTAs are displayed in the `Select MTA` column, any of which can be individually selected for modification or removal. Use the up and down arrowed cursor keys to scroll the display. You can also add a new MTA name.

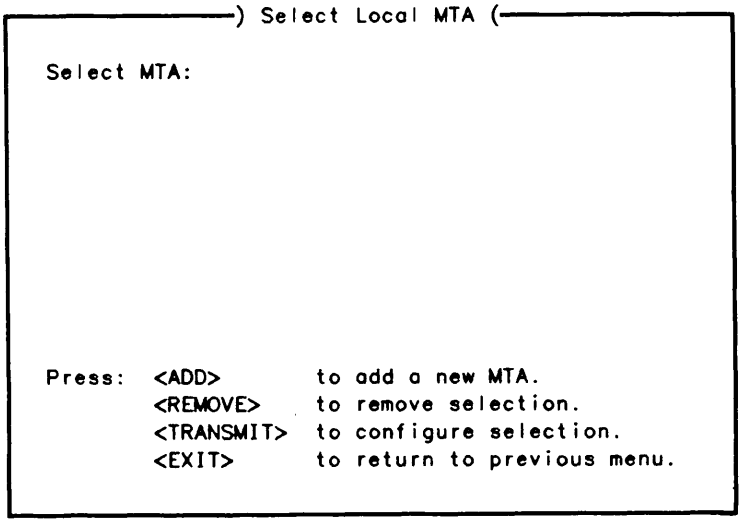

FIGURE 2-9. Select Local MTA Form

If you are selecting an MTA to modify, the Configure Local MTA menu is displayed, as in Figure 2-10. Existing configuration data is displayed in the appropriate fields, as each form is presented.

If you are adding a new MTA, the Define MTA Domain form is displayed, first, as shown in Figure 2-11. When you save your data, the Configure Local MTA menu is displayed.

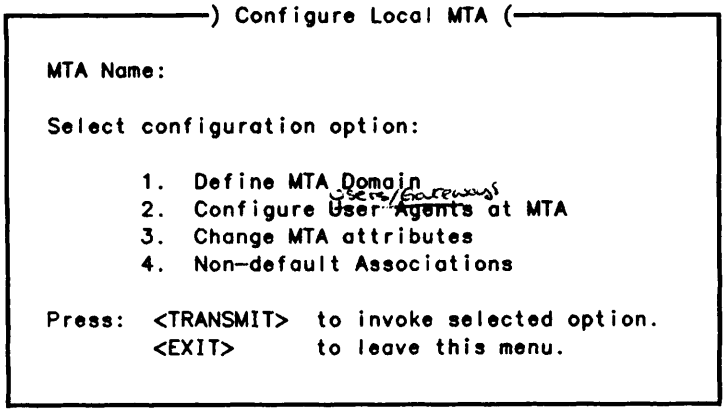

FIGURE 2-10. Configure Local MTA Menu

Define MTA Domain

If you select option 1, `Define MTA Domain`, of the Configure Local MTA menu (Figure 2-10), the Define Local Domain form is displayed, as in Figure 2-11.

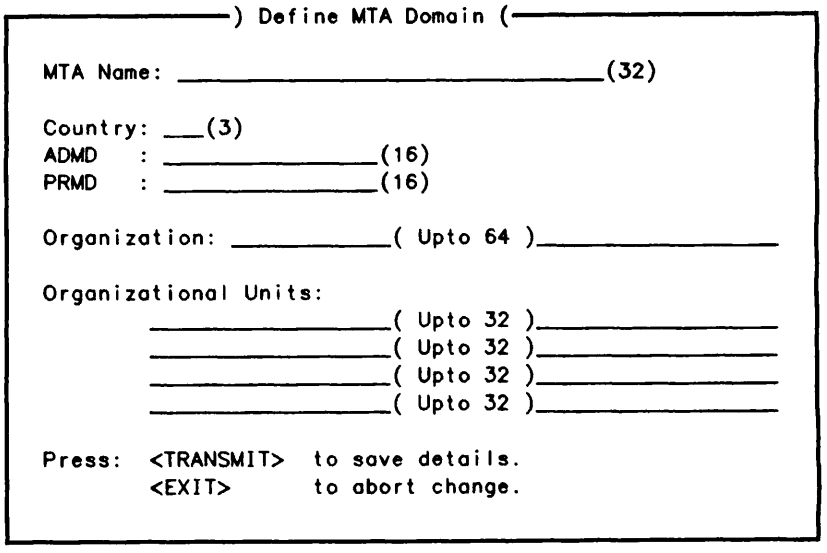

FIGURE 2-11. Define Local Domain Form

Configure User Agents at MTA

If you select option 2, `Configure User Agents at MTA`, on the Configure Local MTA menu, the Select Local User Agents form is displayed, as shown in Figure 2-12.

Names of existing users and gateways are displayed in the `Select User Agent` column, any of which can be individually selected for modification, or removal. Use the up and down arrowed cursor keys to scroll the display. You can also elect to add a new user or gateway.

Bulk loading of users: Users on existing mail lists can be included in the configuration using the bulk loading procedure. Briefly, this involves editing the existing list to produce user records of the correct format, appending the edited list to the configuration file, and invoking the configurator to save the new configuration.

For an example of how to use the bulk loading procedure, refer to Example V in Chapter 4, CONFIG_X400 EXAMPLES.

```
                    ) Select Local User/Gateway Agents (

MTA Name:

Select User Agent:




Press:  <ADD>       to add a new user.
        <GATE>      to add a new gateway.
        <REMOVE>    to remove selection.
        <TRANSMIT>  to configure selection.
        <EXIT>      to return to previous menu.
```

FIGURE 2-12. Select Local User Agents Form

The list displayed shows both users and gateways. As X.400 can determine your selection, pressing TRANSMIT automatically takes you to the appropriate configuration application; either Configure User, or Configure Gateway. Existing configuration data is displayed.

Alternatively, if you are adding a new user or gateway, using the ADD or GATE keys, then you are presented with blank configuration forms.

Note

Configuring Gateways immediately follows this section.

Configuring Users

This section, Configuring Users, is arrived at by pressing <ADD> on the Select Local User Agents form, which is option 2 `Configure User Agents at MTA`, on the Configure Local MTA menu (option 3 of the Main Menu).

Whether you are selecting a user to modify, or are adding a new one, page 1 of the Configure User form is initially displayed. If you are modifying a user, the existing configuration data is displayed in the appropriate fields on each page as they are presented. Use the NXTPAG or PRVPAG keys to access the other three pages of this form.

Form pages 1 and 2	Enable you to specify the O/R address components, as shown in Figure 2-13.
Form page 3	Enables you to control access to the user.
Form page 4	Enables you to select data types supported by the user. Form pages 3 and 4 are shown in Figure 2-14.

```
) Configure User (------) Page 1 of 4 (

MTA Name: _____(32)

User Mail ID: _____(15)

O/R Address:
   Personal Name:
     Surname : _____( Upto 40 )_____ Given Name: _____(16)
     Initials: _____(5)    Generation Qualifier: ___(3)

   Organization Name:
     Organization: _____( Upto 64 )_____
     Units: __(Upto 32)__  __(Upto 32)__  __(Upto 32)__  __(Upto 32)__

   Country: (3)  ADMD: _____(16)_____  PRMD: _____(16)_____

Press:  <TRANSMIT>  to save user details.
        <EXIT>      to abort changes.
        <NXTPAG>    to view next page.
        <PRVPAG>    to view last page.
```

```
) Configure User (------) Page 2 of 4 (

  O/R Address (cont.):

    Unique Numeric ID: _____(10)
    X121 Address     : _____(15)

    Domain Defined Attributes:

       Type       Value
       ___(8)__   _____( Upto 128 )_____
       ___(8)__   _____( Upto 128 )_____
       ___(8)__   _____( Upto 128 )_____
       ___(8)__   _____( Upto 128 )_____


  Press:  <TRANSMIT>  to save user details.
          <EXIT>      to abort changes.
          <NXTPAGE>   to view next page.
          <PRVPAGE>   to view previous page.
```

FIGURE 2-13. Configure Local User Form, Pages 1 & 2

Note

Data entered on Pages 1 and 2, must provide a valid O/R address, as defined in the section User Addresses and Components earlier in this chapter.

O/R address components and their meanings are described in the following list.

Country, ADMD, PRMD and Organization, each default to the values defined in the MTAs local domain, if any. These values may be overwritten, but this results in validation errors when you try to verify the configuration.

Component	*Description*
Country	The country in which the network operates. This is defined by international control bodies. Specify either: • A 3-digit code as defined by CCITT X.121. (For example, UK code is 234, US code is 311). • A 2-letter code defined by ISO 3166/ALPHA-2. (For example, GB, US).
ADMD	Main administration domains within a country. If you are connecting to an X.400 service provided by a public carrier, use the name they give you. If you are connecting to a private Message Handling System, either use a mutually agreed name, or leave the field blank. The ADMD name can contain a maximum of 16 characters.
PRMD	Private administration domains within a country. For mail applications that connect to ADMDs, the PRMD is a matter of negotiation with the ADMD administrator. The PRMD name can contain a maximum of 16 characters.
Organization Name	A name assigned to an organization within a PRMD. Organization Name can contain a maximum of 64 characters.
Organizational Unit(s)	Names of units within an Organization. Up to 4 Organizational Units can be defined. Organizational Units can contain a maximum of 32 characters.
Personal Name	A collection of names that identify an individual mail service user: Surname - 40 characters Given Name - 16 characters Initials - 5 characters Generation Qualifier - 3 characters
Domain Defined Attributes	A group of attributes that are exclusive to X.400 management domains, either ADMDs, or PRMDs. They are further user defined qualifications that can be used to map an existing mail service directory to the O/R addressing scheme.

Attribute names (Type) can contain a maximum of 8 characters, and attribute values (Value) a maximum of 128 characters. Nonprinting characters are allowed.

Unique Numeric ID

A unique ID, identifying device with a numeric keypad, only.

The Unique Numeric ID can contain a maximum of 10 digits.

X121 Address

An address that identifies a users Teletex-type terminal.

The X121 address can contain a maximum of 15 digits, preceded by a colon.

```
                    ) Configure User (—) Page 3 of 4 (

User Access Control:

   User's Mail ID: _____(15)

   System Login ID/Group                Send  Receive
   _____(32)_____                       ___(3)___(3)
   _____(32)_____                       ___(3)___(3)
   _____(32)_____                       ___(3)___(3)
   _____(32)_____                       ___(3)___(3)

Press:  <TRANSMIT>  to save user details.
        <EXIT>      to abort changes.
        <NXTPAGE>   to view next page.
        <PRVPAGE>   to view previous page.
```

```
                    ) Configure User (—) Page 4 of 4 (

  User Supported Data Types:

        Undefined                 : ___(3)
        Telex                     : ___(3)
        Teleprinter (IA5)         : ___(3)
        Group 3 Facsimile         : ___(3)
        Text Interchange Format 0: ___(3)
        Teletex                   : ___(3)
        Videotex                  : ___(3)
        Voice                     : ___(3)
        Simple Formatted Document: ___(3)
        Text Interchange Format 1: ___(3)

  Press:  <TRANSMIT>  to save user details.
          <EXIT>      to abort changes.
          <NXTPAG>    to view first page.
          <PRVPAG>    to view previous page.
```

FIGURE 2-14. Configure Local User Form, Pages 3 & 4

User Access Control

By default, X.400 User Mail IDs are assumed to be the same as PRIMOS User Logon IDs; users thus have access to both send and receive mail services.

If the X.400 User Mail ID is different to the PRIMOS User Logon ID, or the access required is other than the default, then the PRIMOS User Logon ID and mail service access rights for that mail user have to be explicitly stated.

User Supported Data Types

Specify the data types that the user can accept. The range of data types that are supported depends on the mail application or product that uses Prime X.400. The default for all fields is NO. Specify YES for required data types.

Configuring Gateways

This section, Configuring Gateways, is arrived at by pressing <GATE> on the Select Local User Agents form, which is option 2 `Configure User Agents at MTA`, on the Configure Local MTA menu (option 3 of the Main Menu).

If you are adding or modifying a gateway, the Configure Local Gateway menu is displayed, as shown in Figure 2-15

```
) Configure Gateway (

MTA Name :
Gateway Mail ID :

Select configuration option:

        1. Define Gateway Domain
        2. Define O/R Address Space
        3. Define Gateway Security

Press:  <TRANSMIT>  to invoke selected option.
        <EXIT>      to leave this menu.
```

FIGURE 2-15. Configure Local Gateway Menu

Please refer back to the preceding section, Configuring Users, for descriptions and details of the O/R address components.

If values for Country, ADMD, PRMD, and Organization, have been defined for the MTAs local domain, then these will appear as the default values.

Define Gateway Domain

If you select option 1, `Define Gateway Domain`, of the Configure Gateway menu, the Define Gateway Domain form is displayed, as shown in Figure 2-16.

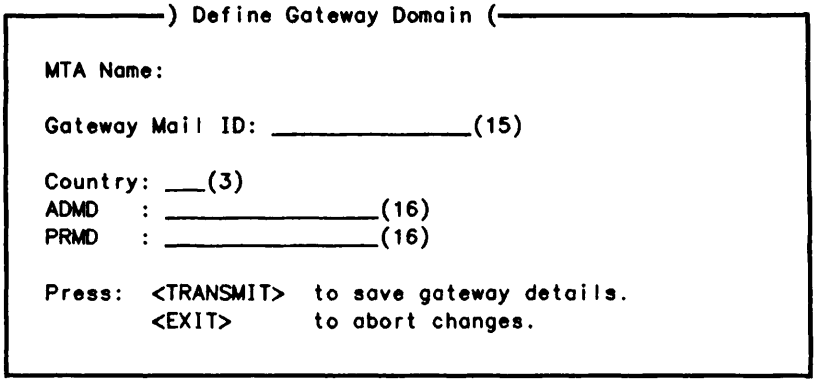

FIGURE 2-16. Define Gateway Domain Form

Define O/R Address Space

If you select option 2, `Define O/R Address Space`, of the Configure Gateway menu, the Select Gateway O/R Address Space form is displayed, as shown in Figure 2-17

Names of existing gateway O/R addresses are displayed in the `Select O/R Address Space` column, any of which can be individually selected for modification, or removal. Use the up and down arrowed cursor keys to scroll the display. You can also elect to add a new O/R address space.

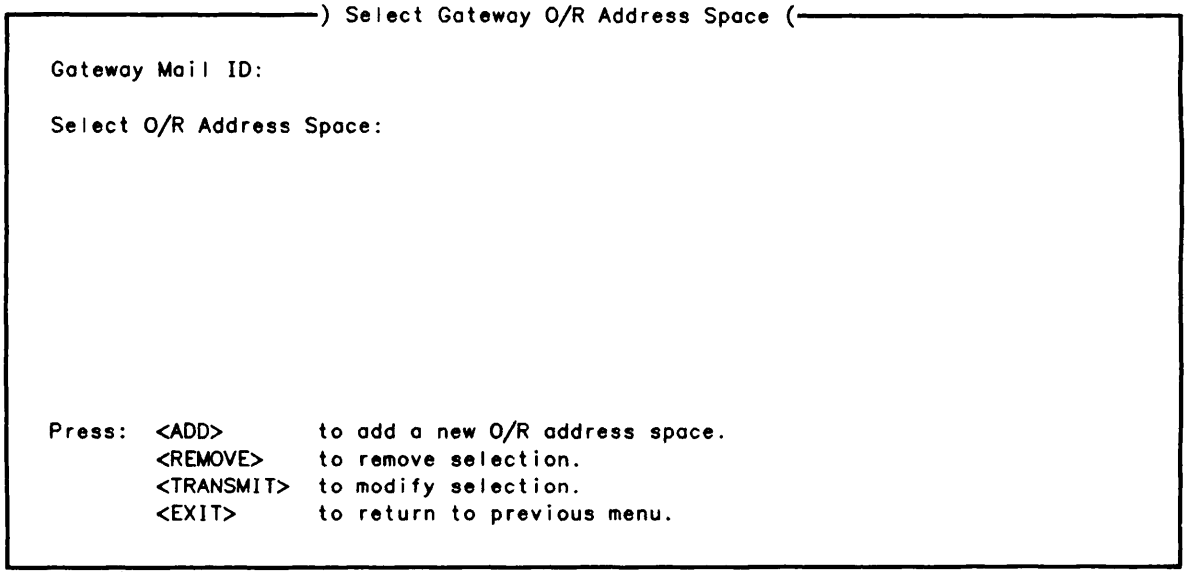

FIGURE 2-17. Select Gateway O/R Address Space Form

Whether you are selecting an O/R address to modify, or are adding a new one, Page 1 of 2 of the Define Gateway O/R Address Space form is displayed, as shown in Figure 2-18. Use the NXTPAG key to access Page 2 of this form. If you are modifying an O/R address, the existing configuration data is displayed in the appropriate fields on each page.

```
) Define Gateway O/R Address Space - Page 1 of 2 (

Gateway Mail ID: _____(15)

O/R Address Space:
   Country: (3)  ADMD: _____(16)_____  PRMD: _____(16)_____

   Organization Name:
     Organization: _____( Upto 64 )_____
     Units: __(Upto 32)__  __(Upto 32)__ __(Upto 32)__ __(Upto 32)__

   Personal Name:
     Surname : _____( Upto 40 )_____ Given Name: _____(16)
     Initials: _____(5)    Generation Qualifier: ___(3)

Press:  <TRANSMIT>  to save address details.
        <EXIT>      to abort changes.
        <NXTPAG>    to view next page.
```

```
) Define Gateway O/R Address Space - Page 2 of 2 (

O/R Address Space (cont.):    Gateway Mail ID:

  Unique Numeric ID: _____(10)
  X121 Address     : _____(15)

  Domain Defined Attributes:

     Type       Value
     ___(8)__   _____( Upto 128 )_____
     ___(8)__   _____( Upto 128 )_____
     ___(8)__   _____( Upto 128 )_____
     ___(8)__   _____( Upto 128 )_____

Press:  <TRANSMIT>  to save O/R Address details.
        <EXIT>      to abort changes.
        <PRVPAGE>   to view previous page.
```

FIGURE 2-18. Define Gateway O/R Address Space Form, Pages 1 & 2

Define Gateway Security

If you select option 3, `Define Gateway Security`, of the Configure Gateway menu, the Gateway Security form is displayed, as shown in Figure 2-19

```
                    ) Gateway Security (

Gateway Access Control:

Gateway Mail ID: _____(15)

System Login ID/Group                    Send   Receive
_____(32)   ___(3)  ___(3)
_____(32)   ___(3)  ___(3)
_____(32)   ___(3)  ___(3)
_____(32)   ___(3)  ___(3)

Press:  <TRANSMIT>  to save gateway details.
        <EXIT>      to return to previous menu.
```

FIGURE 2-19. Gateway Security Form

Note

The following two options both refer to the Configure Local MTA menu, as shown in Figure 2-10.

Change MTA Attributes

If you select option 3, `Change MTA Attributes`, of the Configure Local MTA menu, the Define MTA Attributes form is displayed, as shown in Figure 2-20.

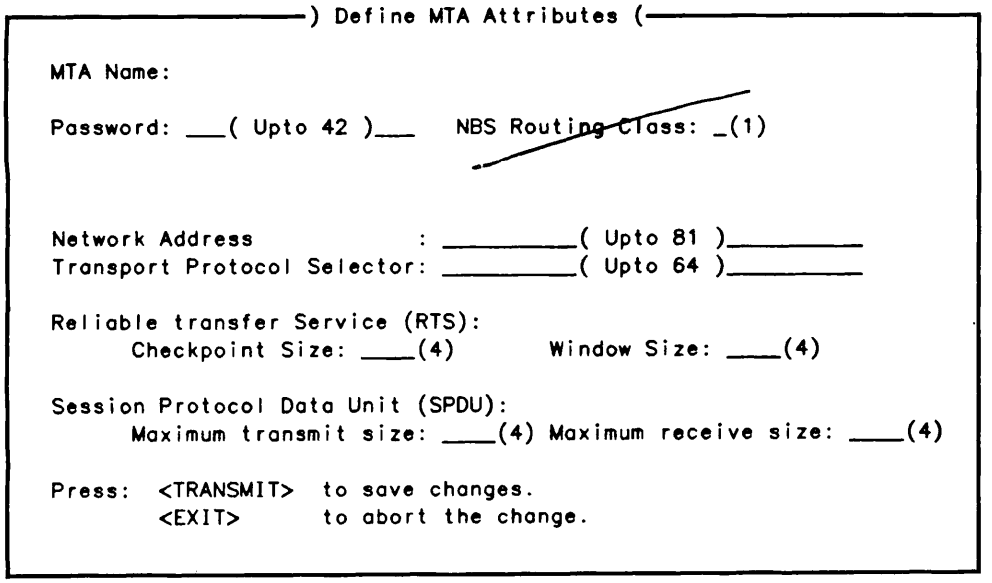

FIGURE 2-20. Define MTA Attributes Form

Local MTA attributes are described in the following list.

Attribute	*Description*
Password	The password that controls communication with the MTA. The MTA only accepts associations from other MTAs, if they quote this password when requesting the association. Password can contain a maximum of 42 characters.
NBS Routing Class	The National Bureau of Standards (NBS) Routing Class, determines the level of routing knowledge, in the form of O/R address components, held at an MTA. Routing Classes can be 1, 2, or 3. Class 1 corresponds to domain attributes only, (Country, ADMD, and PRMD). Class 2 also includes information about Organizations and Organization Units, and Class 3, Personal Names. The default is Class 3; the field is one digit. If you specify a class of less than 3, user addresses can be ambiguous. For details about NBS routing classes, see the NBS implementor's agreement for OSI protocols (Stable Edition).
Network Address	The network address of the MTA. Specify the address in one of the following formats:

- PRIMENET nodename; can contain a maximum of 6 characters. It is recommended that the PRIMENET nodename is the same as the MTA name (a maximum of 32 characters).
- An X121 address. Can contain a maximum of 15 digits, preceded by a colon.

Transport Protocol Selector

Selects the transport protocol to be used by this MTA.

The attribute must be entered as two hexadecimal digits per byte. For example, if the application uses printable characters, and you agree on the 2-byte code that corresponds to ASCII 17, then you must enter 3137.

The maximum size is 32 bytes. The default is 3432.

Checkpoint Size A four-digit number representing the maximum number of 1024-byte data units, that can be transferred between adjacent MTAs before validation is required.

The minimum is zero, the default is 1.

Window Size A four-digit number representing the maximum number of 1024-byte data units, that are allowed to be outstanding during data exchange over an active association.

The minimum is 1, and the default is 3.

Maximum transmit size The maximum permitted data unit size in transmit mode.

Maximum receive size The maximum permitted data unit size in receive mode.

Note

The Reliable Transfer Service (RTS) and Session Protocol Data Unit (SPDU) parameters, represent initial negotiating values. Runtime values are determined by negotiation between MTAs.

Non-default Associations

If you select option 4, `Non-default Associations`, on the Configure Local MTA menu (Figure 2-10), the Define Non-default Associations form is displayed, as in Figure 2-21.

```
                    ) Define Non-default Associations (

MTA Name:

Adjacent MTAs:




Press:  <ADD>       to add a new adjacent MTA.
        <REMOVE>    to remove selection.
        <TRANSMIT>  to modify selection.
        <EXIT>      to return to previous menu.
```

FIGURE 2-21. Define Non-default Associations Form

Names of existing associations to adjacent MTAs, are displayed in the Adjacent MTAs column, any of which can be individually selected for modification, or removal. Use the up and down arrowed cursor keys to scroll the display. You can also elect to add a new association to an adjacent MTA.

Whether you are selecting an association to modify, or are adding a new one, the Configure Associations form is displayed, as shown in Figure 2-22. If you are modifying an association, the existing configuration data is displayed in the appropriate fields of the form.

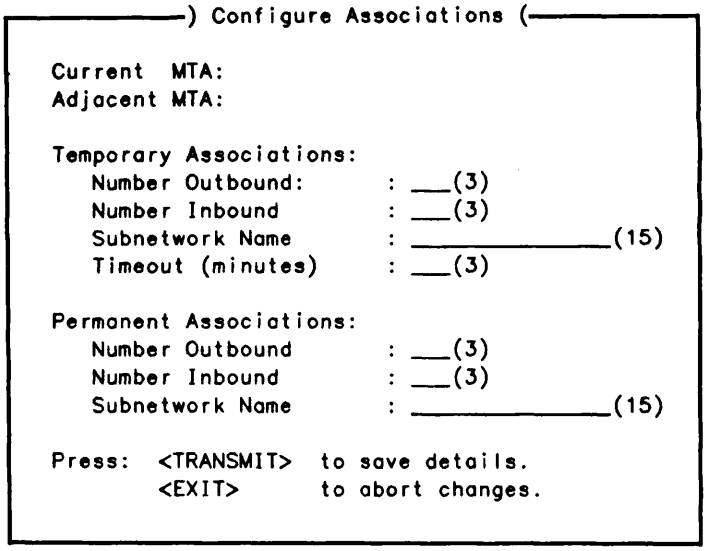

FIGURE 2-22. Configure Associations Form

To configure non-default associations, specify the numbers of inbound and outbound associations, the type of subnetwork, and for temporary associations, the inactivity timeout period.

Outbound associations are those that carry data from the local MTA to the adjacent MTA.

Inbound associations are those that carry data from the adjacent to the local MTA.

For further information about associations and subnetwork definitions, refer to Figure 2-3, the CONFIG_X400 Main Menu, Option 2, Setting Configuration Defaults, sub-options 2 and 3, earlier in this chapter.

CONFIG_X400 Option 4 - Configure Local User Agents

Option 4, Configure Local User Agents of the CONFIG_X400 Main Menu (Figure 2-3), enables direct access to Configuring User Agents (users and gateways), otherwise accessed through Option 3.2, Configure User Agents at MTA. You can specify the O/R addresses and MTA attachments of users and gateways in your configuration.

When you select the Configure Local Users/Gateways option, the Select Local User form is displayed, as shown in Figure 2-23. This option permits the display of *all* User and Gateway Mail IDs and their relevant MTA names, unlike Option 3.2, which only displays User Mail IDs particular to the MTA being configured.

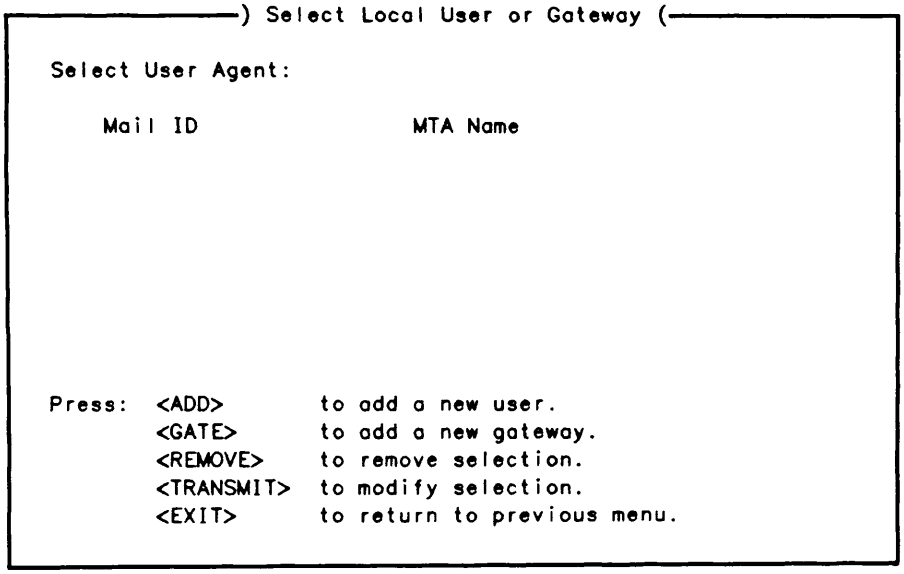

FIGURE 2-23. Select Local User Form

The list displayed shows existing users and gateways. As X.400 can determine your selection, pressing TRANSMIT automatically takes you to the appropriate configuration; either Configure User or Configure Gateway. Existing configuration data is displayed.

Alternatively, if you are adding a new user or gateway, using the ADD or GATE keys, then you are presented with the appropriate blank configuration form.

Note

Refer to the Configure User section, and the Configure Gateways section, earlier in this chapter, for details of these applications.

CONFIG_X400 Option 5 - Define Remote MTAs

Option 5, `Define Remote MTAs` of the CONFIG_X400 Main Menu, (Figure 2-3), enables you to specify the protocols for communicating with remote MTAs, and the O/R addresses of users that are attached to them.

On the menus and forms that follow, select options by either positioning the cursor/highlight bar on the required option and pressing TRANSMIT, or, typing the option number and pressing TRANSMIT. Select an entry from a list by positioning the cursor/highlight bar on the required entry and pressing TRANSMIT. On Data Input forms, use the TAB, BACK TAB, or arrowed cursor keys, to move from field to field; use the TRANSMIT key to save your data.

You must specify the following data when defining remote MTAs:

- The global domain
- MTA protocols and passwords
- O/R address spaces on specific MTAs

Remote MTAs, are MTAs controlled by other administrators, with which you wish to communicate. They form the access points through which users in your configuration exchange messages with users in other configurations.

Remote MTAs are the responsibility of other administrators, and you may need to cooperate to obtain MTA configuration attributes such as the remote name, password, protocol selectors and network address.

When you select the `Define Remote MTAs` option, the Select Remote MTA form is displayed, as shown in Figure 2-24.

Names of existing remote MTAs are displayed in the `Select MTA` column, any of which can be individually selected for modification, or removal. Use the up and down arrowed cursor keys to scroll the display. You can also elect to add a new remote MTA.

```
) Select Remote MTA (

Select MTA:




Press:  <ADD>       to add a new MTA.
        <REMOVE>    to remove selection.
        <TRANSMIT>  to modify selection.
        <EXIT>      to return to previous menu.
```

FIGURE 2-24. Select Remote MTA Form

If you are selecting a remote MTA to modify, the Define Remote MTA menu is displayed, as shown in Figure 2-25. Existing configuration data is displayed in the appropriate fields as each form is presented.

If you are adding a new remote MTA, the Define Global Domain ID form is displayed. When you save your data, the Define Remote MTA menu is displayed.

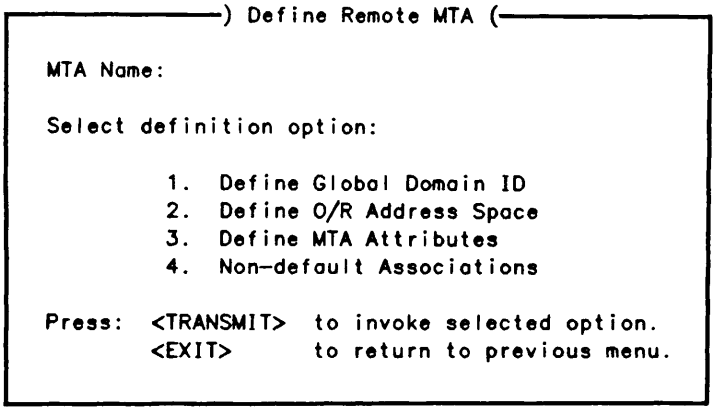

FIGURE 2-25. Define Remote MTA Menu

Define Global Domain ID (Remote)

If you select option 1, `Define Global Domain ID`, on the Define Remote MTA menu (Figure 2-25), the Define Global Domain ID form is displayed, as in Figure 2-26.

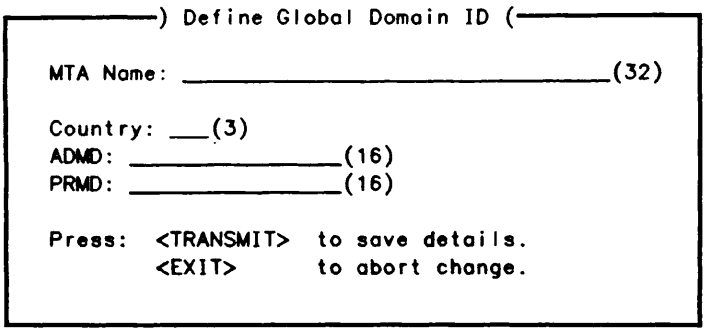

FIGURE 2-26. Define Global Domain ID Form

MTA Name is the name you must use to communicate with the remote MTA. Obtain the name from the remote MTA's administrator. The MTA Name can contain a maximum of 32 characters.

Define the domain for a particular remote MTA by specifying Country, ADMD, and PRMD. Details and explanations of these fields can be found in the section, CONFIG_X400 Option 1 - Set Global Domain ID, earlier in this chapter.

Define O/R Address Space

If you select option 2, `Define O/R Address Space`, on the Define Remote MTA menu (Figure 2-25), the Select Remote MTA O/R Address Space form is displayed, as in Figure 2-27.

Names of existing remote MTA O/R addresses are displayed in the `Remote MTA Name` column, any of which can be individually selected for modification or removal. Use the up and down arrowed cursor keys, to scroll the display. You can also elect to add a new remote MTA O/R address space.

```
) Select Remote MTA O/R Address Space (

Remote MTA Name:

Select O/R Address Space:




Press:  <ADD>       to add a new O/R address space.
        <REMOVE>    to remove selection.
        <TRANSMIT>  to modify selection.
        <EXIT>      to return to previous menu.
```

FIGURE 2-27. Select Remote MTA O/R Address Space Form

Whether you are selecting a remote MTA O/R address to modify, or are adding a new one, Page 1 of 2 of the Define Remote O/R Address Space form is displayed, as shown in Figure 2-28. Use the NXTPAG key to access Page 2 of this form. If you are modifying a remote MTA O/R address, the existing configuration data is displayed in the appropriate fields on each page.

```
) Define Remote O/R Address Space (—) Page 1 of 2 (

MTA Name:

O/R Address Space:
   Country: (3)   ADMD: _____(16)_____  PRMD: _____(16)_____

   Organization Name:
     Organization: _____( Upto 64 )_____
     Units: __(Upto 32)__ __(Upto 32)__ __(Upto 32)__ __(Upto 32)__

    Personal Name:
     Surname : _____( Upto 40 )_____ Given Name: _____(16)
     Initials: _____(5)    Generation Qualifier: ___(3)

Press:  <TRANSMIT>  to save user details.
        <EXIT>      to abort changes.
        <NXTPAGE>   to view next page.
```

```
) Define Remote O/R Address Space (—) Page 2 of 2 (

O/R Address Space (cont.):

  Unique Numeric ID: _____(10)
  X121 Address     : _____(15)

  Domain Defined Attributes:

     Type       Value
     ___(8)__   _____( Upto 128 )_____
     ___(8)__   _____( Upto 128 )_____
     ___(8)__   _____( Upto 128 )_____
     ___(8)__   _____( Upto 128 )_____

Press:  <TRANSMIT>  to save O/R address details.
        <EXIT>      to abort changes.
        <PRVPAGE>   to view previous page.
```

FIGURE 2-28. Define Remote O/R Address Space Form, Pages 1 & 2

Define the remote O/R address space by completing as many of the address component fields as necessary, to ensure that there is no ambiguity in O/R addresses.

The descriptions and explanations of O/R address components can be found in the section CONFIG_X400 Option 3 - Configure Local MTAs, earlier in this Chapter.

Define MTA Attributes

If you select option 3, Define MTA Attributes, of the Define Remote MTA menu (Figure 2-25), the Define Remote MTA Attributes form is displayed, as in Figure 2-29.

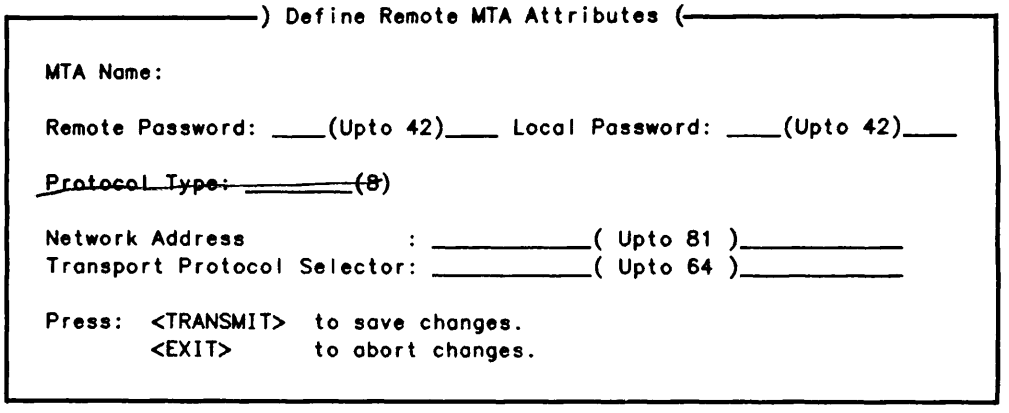

FIGURE 2-29. Define Remote MTA Attributes form

Remote MTA attributes are described in the following list.

Attribute	*Description*
Remote Password	The password that identifies the remote MTA. Obtain the password from the remote MTAs' administrator. The remote MTA password can contain a maximum of 42 characters.
Local Password	The password that the local MTA must supply to the remote MTA domain, in order to communicate with the local MTA; assigned by local administrator. Local Password can contain a maximum of 42 characters.
Protocol Type	The protocol type used by the remote MTA. The protocol type is set to either CCITT-84 (the default), or MOTIS. CCITT-84 is the CCITT X.400 protocol; MOTIS is the ISO equivalent.
Network Address	The ISO network address (NSAP) of the remote MTA. Specify the address in one of the following formats: • PRIMENET Nodename: Can contain a maximum of 81 characters. • An X121 address: Upto 15 digits long, preceded by a colon.

Transport Protocol Selector

Selects the ISO transport protocol. Obtain from the MTAs administrator.

Enter as two hexadecimal digits per byte. For example, if the application uses printable characters, and you agree on the 2-byte code that corresponds to ASCII 17, then you must enter 3137.

The maximum permitted size is 32 bytes, and the default value is 3432.

Non-default Associations

If you select option 4, `Non-default Associations`, on the Define Remote MTA menu (Figure 2-25), the Define Non-default Associations form is displayed, as in Figure 2-30.

Names of existing adjacent MTA associations are displayed in the `MTA Name` column, any of which can be individually selected for modification or removal. Use the up and down arrowed cursor keys, to scroll the display. You can also elect to add a new Adjacent MTA Association.

```
) Select Non-default Associations (

MTA Name:

Adjacent MTAs:




Press:  <ADD>       to add a new adjacent MTA.
        <REMOVE>    to remove selection.
        <TRANSMIT>  to modify selection.
        <EXIT>      to return to previous menu.
```

FIGURE 2-30. Define Non-default Associations Form

If you are selecting an adjacent MTA association to modify, the Configure Associations form is displayed, as in Figure 2-31, while existing configuration data is displayed in the appropriate fields on each form.

If you are adding a new adjacent MTA, you are initially presented with a list of existing MTAs in a form-like environment. Selection of one of these MTAs results in that MTA being added to the non-default associations for the current MTA. When the Select Non-default Associations form is redisplayed, select an adjacent MTA for modification, if required. The Configure Associations form is displayed.

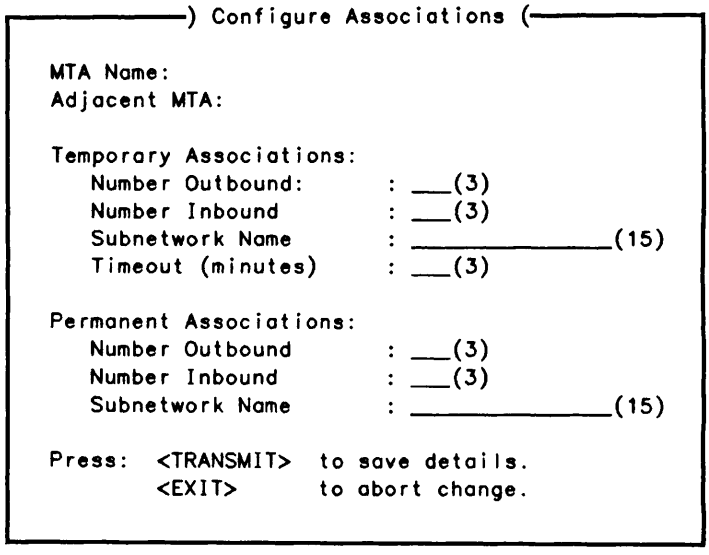

FIGURE 2-31. Configure Associations Form

To configure non-default associations, specify the numbers of inbound and outbound associations, the type of subnetwork, and, for temporary associations, the inactivity timeout period.

Outbound associations are those that carry data from the local MTA to the adjacent MTA. **Inbound** associations are those that carry data from the adjacent to the local MTA.

For further information about associations and subnetwork definitions, see CONFIG_X400 Option 2 - Set Configuration Defaults, earlier in this chapter.

CONFIG_X400 Option 6 - Define Remote O/R Addresses

Option 6, `Define Remote O/R Addresses` of the CONFIG_X400 Main Menu (Figure 2-3), enables you to specify the O/R address space(s) associated with a specific remote MTA. It enables you to define a new address space, or remove or modify an existing one.

When you select the `Define Remote O/R Addresses` option, the Select Remote O/R Address form is displayed, as shown in Figure 2-32.

Names of existing remote O/R addresses are displayed in the `Select O/R Address Space` column, all of which can be individually selected for modification, or removal. Use the up and down arrowed cursor keys, to scroll the display. You can also elect to add a new O/R Address Space.

```
                    ) Select Remote O/R Address Space (

Select O/R Address Space:

O/R Address Space                                    Remote MTA




Press:  <ADD>       to add a new O/R address space definition.
        <REMOVE>    to remove selection.
        <TRANSMIT>  to modify selection.
        <EXIT>      to return to previous menu.
```

FIGURE 2-32. Select Remote O/R Address Space Form

Whether you are selecting a remote MTA O/R address to modify, or are adding a new one, Page 1 of 2 of the Define Remote O/R Address Space form is displayed. Use the NXTPAG key to access the Page 2 of this form.

For further details, please refer to Figure 2-28, in the preceding section, CONFIG_X400 Option 5 - Define Remote MTAs.

CONFIG_X400 Option 7 - ~~Define Alternate Recipient~~

Option 7, `Define Alternate Recipient`, of the CONFIG_X400 Main Menu (Figure 2-3), enables you to define a default recipient for undelivered mail.

On the form that follows, use the TAB, BACK TAB, or arrowed cursor keys, to move from field to field; use the TRANSMIT key to save your data.

When you select this option, the Define Alternate Recipient form is displayed, as shown in Figure 2-33.

```
                ) Define Alternate Recipient (

Recipient of all undeliverable mail:

   User's Mail ID: _______________(15)
   MTA Name      : ________( Upto 32 )________

Press:  <TRANSMIT>  to save details.
        <EXIT>      to abort change.
```

FIGURE 2-33. Define Alternate Recipient Form

In order to define an alternate recipient, you must enter an MTA Name as the *minimum* requirement. The fields of the Define Alternate Recipient form are described below.

Field	*Description*
User's Mail ID	The mail ID of a previously configured local User Agent, either a user or gateway, who will receive all nondeliverable mail. The User's Mail ID can contain a maximum of 15 characters.
MTA Name	The MTA Name can contain a maximum of 32 characters. If only the MTA is specified, then the MTA must be a remote MTA, and the User's Mail ID should be left blank. If both the MTA Name and User's Mail ID are specified, then the MTA must be the one under which the User's Mail ID, resides.

CONFIG_X400 Option 8 - Verify Configuration

Option 8, `Verify Configuration` of the CONFIG_X400 Main Menu, (Figure 2-3), enables you to verify your existing or new configurations.

While verification is taking place, one of these messages may appear on screen. For example:

```
Verifying configuration... please wait...
```

Or

```
Validation complete... No errors.
```

Press EXIT to return to the CONFIG_X400 Main Menu.

If the configuration cannot be verified, errors are reported and the existing configuration data will be unable to start Prime X.400 on the system. You, the Administrator, should revise the configuration data to correct the errors, and reselect Option 8, `Verify Configuration`, from the CONFIG_X400 Main Menu, to ensure the changes validate the configuration.

Typical errors reported during nonverification are

- Local users O/R address attributes do not match the domain name.
- NSAP is missing for an MTA.
- Undefined subnetwork definition referenced.
- Remote MTA has no associations to local MTAs.
- Alternate recipient Mail ID is not known.
- Alternate recipient MTA is not known.

CONFIG_X400 Option 9 - Save Configuration

Option 9, `Save Configuration` of the CONFIG_X400 Main Menu, (Figure 2-3), enables you to save your configuration to disk.

You can use the Save function at any time, either to store an unfinished configuration for later modification, or to store a completed and verified configuration permanently to disk.

Configurations are automatically verified before being saved to disk.

However, specific errors are *not* reported. Use Option 8, `Verify Configuration` of the Main Menu, to obtain reported errors.

If the verification fails, you are queried about the SAVE. If the verification succeeds, your configuration is saved to disk.

When you select the `Save Configuration` option of the CONFIG_X400 Main Menu, the Save Configuration form is displayed, as shown in Figure 2-34.

There are two input fields on this form:

Field	*Description*
Configuration File	Can be any PRIMOS pathname. The pathname can contain a maximum of 128 characters.
Comment	Can be any remarks you wish to make. The comment can contain a maximum of 128 characters. The comment is displayed in the configuration file information display when you invoke CONFIG_X400. (Refer to Figure 2-1.)

Use the TAB, BACK TAB, or arrowed cursor keys, to move between fields.

```
                    ) Save Configuration (

Configuration File: _________( Upto 128 )_________

Comment: ____________________( Upto 128 )_________

Press:  <TRANSMIT>  to save configuration.
        <EXIT>      to abort save and return to menu.
```

FIGURE 2-34. Save Configuration Form

On completion, a message, `Configuration saved`, appears on your screen. Press EXIT to return to the CONFIG_X400 Main Menu.

CONFIG_X400 Option 0 - List Configuration

Option 0, `List Configuration` of the CONFIG_X400 Main Menu, (Figure 2-3), enables you to save a listing of your configuration to a disk file.

When you select this option, the List Configuration form is displayed, as shown in Figure 2-35.

Specify any *filename* for your listing; this can be a file in the current directory, or a fully specified pathname. Existing files may be overwritten or appended-to; the initial defaults are NO for both. Type YES, or Y, against the appropriate prompt. Append is the default if YES should accidently be specified for both.

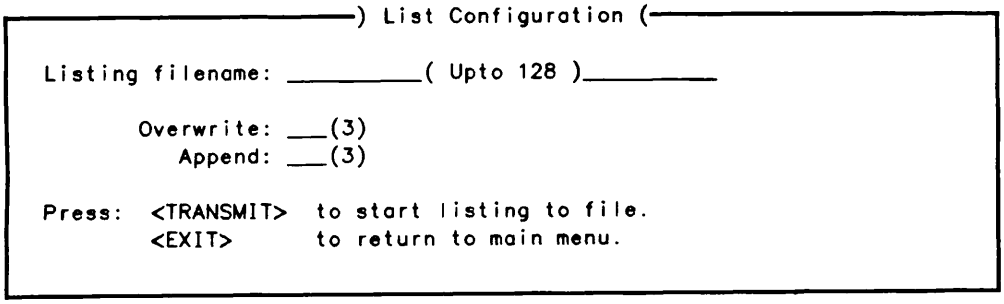

FIGURE 2-35. List Configuration Form

3

OPERATION AND MONITORING

Introduction

This chapter describes the ADMIN_X400 command, its options and subcommands, that you use to start, stop, monitor, and control Prime X.400 on the system.

Release 1.1 Syntax.

Release 1.1 introduces a more concise style of subcommand syntax, which permits an abbreviated form of the subcommand verb and less complex options, whilst still fully supporting the syntax used in Release 1.0.

Conventions for Subcommand Syntax

Whilst describing the ADMIN_X400 subcommands in this text

- UPPERCASE letters are used throughout for the subcommands
- User required variables are shown entirely in lowercase.

However, at your terminal, subcommands may be typed in UPPER or lower case, or a combination of both upper and lower case.

Command Line Editing

The Erase and Kill characters defined within your PRIMOS environment, may be used to edit command or subcommand line entries.

The ADMIN_X400 Command

The ADMIN_X400 command enables you to control and monitor Prime X.400. You can use the command in two ways.

- Use the command *with* options to start and stop Prime X.400 on your system.
- Use the command *without* options to invoke the subcommand environment, which enables you to
  - Display users' status and O/R addresses
  - Display gateways' status and O/R addresses
  - Display MTA configuration data
  - Display queues
  - Display all errors at your terminal

User Access

ADMIN_X400 is an operator command used to start and stop Prime X.400, and can only be invoked from the supervisor terminal.

The X400_TERMINATE subcommand, which has a similar function to the -STOP command, and is described later in this Chapter, can be invoked from terminals other than the supervisors.

Access to the ADMIN_X400 subcommands, and the -STOP option, is enabled using the access category ADMIN.ACAT in the PRIME_X400* directory. Users with at least U, (Use) access assigned in this category, can invoke the subcommands from a normal terminal. (Refer to the *PRIMOS Commands Reference Guide* for access rights.)

Command Syntax

The syntax of the command is shown below.

▶ **ADMIN_X400 [options [suboptions]]**

The options and suboptions, are described in the following list.

Option	*Description*
-START [mta_name] [**-CONFIG filename** | { **-TRACE service level [address]** | **-MAX_USERS max_users** }]	Starts a specific Prime X.400 MTA on this node. If you do not give an MTA name, the local node name is used.

The CONFIG, TRACE, and MAX_USERS suboptions of the -START option, are described below.

Option *Option Description*

-CONFIG

To start the MTA with a particular configuration, specify -CONFIG followed by the configuration filename. If you do not specify a filename, the default configuration file, PRIME_X400*>PRIME_X400.CONFIG is used. If the startup configuration file is corrupt, Prime X.400 starts with its most recent, valid configuration.

-TRACE service level [address]

Enables tracing of various activities within the X400 Server. The TRACE output is written to the Server COMO file, which resides within the PRIME_X400*, UFD.

The two *service* parameters are X25, or MSG. The *level* of tracing available for each, is described below.

X25 Service

Level *TRACE*

0 The default. NO tracing.

1 Gives notification of network connections to other MTAs.

2 Gives full Hexadecimal dumps, of all messages sent and received over the network.

The optional *address*, can be used to enable tracing of a single network address, only.

MSG Service

Level *TRACE*

0 NO tracing.

1 Gives notification of all Interpersonal Message transfers, conducted by the MTA.

-MAX_USERS max_users
Specifies the percentage of configured users at the MTA, that is permitted to log on at any one time.

The default value is 25.

-STOP [-FORCE] Shuts down Prime X.400 on the system. To forcibly stop the server, specify -FORCE.

-ON nodename Invokes the subcommand environment for the MTA on the specified node. This option can not be used with the -START and -STOP options.

{-HELP | -H} [{-NO_WAIT | -NW}]

Explains how to use the command. This option cancels any other options on the command line. If you specify -NO_WAIT, the display is not paginated at your terminal. The same information is available through the PRIMOS HELP subsystem.

-USAGE Gives you the command syntax in brief. This option cancels all others on the command line.

Starting and Stopping Prime X.400

To start Prime X.400 on your system, type the following command at the system terminal:

```
ADMIN_X400 -START
```

This starts Prime X.400 with the default configuration. To use a specific configuration, specify the -CONFIG *filename* option.

Prime X.400 may take a few minutes before it has gained a mail processing state. You can determine this by using the STATUS USERS command at PRIMOS level, to see when the X400_SERVER comes on line.

The ADMIN_X400 -START command can be included in your PRIMOS.COMI system startup file if required.

To stop Prime X.400 on your system, type the following command at your system terminal:

```
ADMIN_X400 -STOP
```

This shuts down all MTA associations and logs the server out, after ensuring that all active sessions are closed.

Note

Refer also, to the ADMIN_X400 subcommand - X400_TERMINATE - described later in this chapter.

Display and Control Subcommands

This section gives a general description of the display and control subcommands: detailed descriptions are given in the subsequent sections.

Invoking the Subcommand Environment

You can enter the display and control subcommand environment by invoking the ADMIN_X400 command with no options. This is shown below; user input is shown underlined.

```
OK, ADMIN_X400

[ADMIN_X400 Rev. 1.1.0-21.0.3 Copyright (c) 1988, Prime Computer, Inc.]

Establishing connection to X400... please wait

Welcome.
X400:
```

The prompt, X400: indicates the system is ready to receive subcommands.

Quitting the Subcommand Environment

To quit from the ADMIN_X400 subcommand environment and return to PRIMOS, type Q or QUIT. For example:

```
X400: Q                    Or          X400: QUIT
```

Display and Control Subcommands

The subcommand environment supports display and control commands.

The display commands give you up to the minute status information about MTAs, users, and gateways, within the configuration. The display subcommands and their abbreviated forms are shown below:

- DISPLAY_USER
  or DU
- DISPLAY_GATE
  or DG
- DISPLAY_MTA
  or DM

- DISPLAY_ASSOC
  or DA
- DISPLAY_QUEUE
  or DQ
- DISPLAY_ORNAME
  or DOR

The Control subcommands enable you to control the operation of Prime X.400 on the system. The Control subcommands and their abbreviated forms are shown below:

- X400_LOGGING
  or L
- X400_TERMINATE
  No abrreviated form.

Help

To obtain help on display or control subcommand syntax and usage, type -HELP or -H, within the subcommand environment.

Syntax

Subcommands consist of a hyphenated verb or pertinent abbreviation, usually followed by an operand.

The operand identifies the entity on which the command operates; for example, in DISPLAY commands, the operand identifies the entity to display.

Operands for subcommands consist of qualified keywords that identify a specific entity or group of entities, such as Prime X.400 routing table identifiers, that is, Mail IDs or MTA names. Keyword qualifiers are further keywords prefixed by the hyphen character, (-).

Below are examples of the full and abbreviated subcommand syntax:

```
DISPLAY_USER JOE                  or...   DU JOE

DISPLAY_QUEUE -INQUEUE -FULL      or...   DQ -I -F
```

The Display Subcommands

This section describes the ADMIN_X400 display subcommands and their syntax. Each subcommand is fully described, and examples of its usage are included.

These subcommands enable you to display:

- The X.400 communication status of users
- Adjacent MTAs
- Details of MTA Associations
- Gateway connections
- Users' and Gateways' full O/R addresses
- Status of user, gateway and MTA send/receive queues.

The Display subcommands and their functions are described in the following list.

Subcommand	*Function*
{**DISPLAY_USER** / **DU**}	Displays the X.400 communication status of local users.
{**DISPLAY_GATE** / **DG**}	Displays the configuration data for gateway users.
{**DISPLAY_MTA** / **DM**}	Displays the names of adjacent MTAs, and the numbers of associations they have with the local MTA.
{**DISPLAY_ASSOC** / **DA**}	Displays the status of associations with adjacent MTAs. Data returned includes ownership, type, and current status of the connection.
{**DISPLAY_QUEUE** / **DQ**}	Displays details of send/receive queues for both users, gateways and MTAs.
{**DISPLAY_ORNAME** / **DOR**}	Displays the full O/R address of a specific user or gateway.

Primary and Secondary Subcommands

Display subcommands are of two types: primary and secondary.

Primary commands give direct information about the main configuration entities, that is , users, MTAs, and gateways. DISPLAY_USER, DISPLAY_GATE and DISPLAY_MTA are primary commands.

Secondary commands give specific information about the main configuration entities, and require the prior specification of a user, MTA, or gateway. DISPLAY_ORNAME, DISPLAY_QUEUE and DISPLAY_ASSOC are secondary commands.

The requirements of the secondary display commands are illustrated in Figure 3-1.

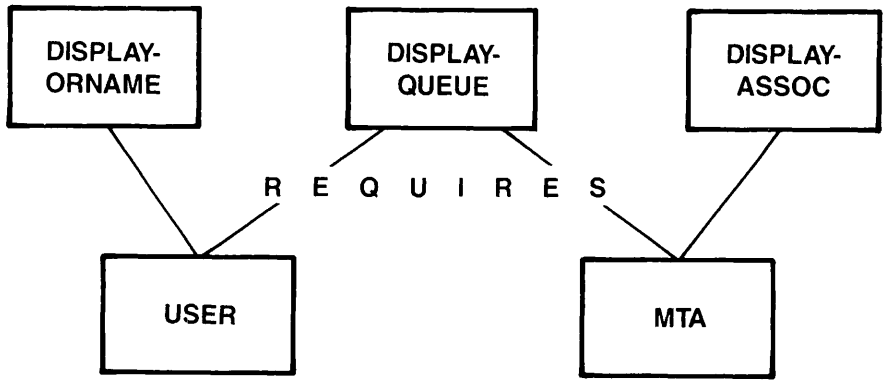

FIGURE 3-1. Requirements of Display Commands

Display Defaults

ADMIN_X400 stores the last primary and the last secondary display argument that you specify. These become the defaults for all subsequent commands until you change them.

For example, if you use the subcommand DISPLAY_USER JOE to display the status of mail user JOE, the user name JOE is stored as the default display argument. If you then use the subcommand DISPLAY_ORNAME -DEFAULT, the command displays the O/R address of user JOE.

When using secondary DISPLAY subcommands, specify either the default entity using the DEFAULT keyword, or one of your choice.

Note

The following sections give details of the display commands, their syntax, operands and codes, together with examples of displays.

The DISPLAY_USER Subcommand

The DISPLAY_USER subcommand displays the communication status of Prime X.400 users.

▶ **DISPLAY_USER** {**mail_id** | **-All** | **-Default**}
DU

Operand	*Description*
mail_id	Displays data about the specified Mail ID. This operand updates the default user.
-All	Displays data about all users in the configuration.
-Default	Displays data about the default user.

Status Codes

When you use the DISPLAY_USER subcommand a display will appear at your terminal, showing user and status information. Communication status codes indicate the current state of the user's X.400 session. Their meanings are described in the following list.

Code	*Description*
RESET	User not logged in
IDLE	User logged in, inactive
PND RSP	Awaiting reply from user
PND CNF	User awaiting confirmation from system
PND ACK	System awaiting acknowledgement from user
PND CLS	Logoff (from Prime X.400) in progress

Example Displays

User input is shown underlined.

```
DISPLAY-USER -All                    Or    DU -All          Or    DU -A

USER              STATUS
BILL              IDLE
JOE               IDLE
End-Of-Table

DISPLAY-USER bill                    Or    DU bill
User bill not found.

DISPLAY-USER BILL                    Or    DU BILL

USER              STATUS
BILL              IDLE
End-Of-Table

DISPLAY_USER -Default                Or    DU -Default      Or    DU -D

USER              STATUS
BILL              IDLE
End-Of-Table
```

In this last example, as the user BILL was the last defined *primary* argument, it has become the default.

Messages From DISPLAY_USER

The following message appears if the specified user does not exist within the configuration.

```
User <Mail ID> not found.
```

The DISPLAY_GATE Subcommand

The DISPLAY_GATE subcommand displays a list of *all* gateways configured at the specified MTA, and the number of connections to the MTA. There is only one operand with this subcommand.

▶ **DISPLAY_GATE** {**-All**}
DG

Operand	*Description*
-All	Displays gateway names and the number of connections with the local MTA.

When you use the DISPLAY_GATE subcommand, a display appears on your terminal showing all the configured gateway names.

Example Display

User input is shown underlined.

```
DISPLAY_GATE -All          Or    DG -All          Or    DG -A

GATEWAY
gate1
gate2
End-of-Table
```

Messages From DISPLAY_GATE

The following message appears if the specified gateway does not exist within the configuration.

```
Gateway <Mail ID> not found.
```

The DISPLAY_MTA Subcommand

The DISPLAY_MTA subcommand displays the number of associations configured from adjacent MTAs to your local MTA.

▶ **DISPLAY_MTA** { **mta_name** | **-All** | **-Default** }
DM

Operand	*Description*
mta_name	Displays the number of associations for a specific adjacent MTA. This operand updates the default MTA.
-All	Displays the number of associations for all adjacent MTAs.
-Default	Displays the number of associations for the default MTA.

When you use the DISPLAY_MTA subcommand, a display appears on your terminal showing ADJACENT MTA names and the number of ASSOCIATIONS.

Example Displays

User input is shown underlined.

```
DISPLAY-MTA -All                    Or    DM -All          Or    DM -A

ADJACENT MTA      ASSOCIATIONS
NODE1             0002
NODE2             0002
End-Of-Table

DISPLAY-MTA NODE1                   Or    DM NODE1

ADJACENT MTA      ASSOCIATIONS
NODE1             0002
End-Of-Table

DISPLAY-MTA -Default                Or... DM -Default      Or... DM -D

ADJACENT MTA      ASSOCIATIONS
NODE1             0002
End-of-Table
```

In the last example, as NODE1 was the last defined primary argument, it is used as the default.

Messages From DISPLAY_MTA

The following message appears if the specified MTA does not exist within the configuration.

```
Adjacent mta <MTA name> not found.
```

The DISPLAY_ASSOC Subcommand

The DISPLAY_ASSOC command displays details about associations configured to a specific adjacent MTA.

▶ **DISPLAY_ASSOCDA** { **mta_name** | **-Default** }

Operand	*Description*
mta_name	Displays association data about a specific MTA. This operand updates the default MTA entry.
-Default	Displays association data about the default MTA.

When you use the DISPLAY_ASSOC subcommand, the following fields of information are displayed on your terminal:

NAME	Name of the associated MTA
OWNER	Association ownership (local, permanent, temporary, remote)
TYPE	Association type (monolog, or dialog)
STATE	Association state (open, closed, opening, closing, sending, receiving, error, or aborted)

The following paragraphs describe the OWNER, TYPE and STATE data fields that are shown on your terminal display.

Association Ownership (OWNER)

Association ownership is the capacity to control message transfer between the two associated MTAs.

There are three possible ownership states.

State	*Description*
TEMP	Locally owned and temporary
PERM	Locally owned and permanent
REMOTE	Remotely owned

Association Types (TYPE)

Association type relates to the dual nature (half or full) of the association between two adjacent MTAs.

There are two possible association types:

Type	*Description*
MONOLOG	Data flow allowed in one direction only
DIALOG	Data flow allowed in both directions

Association States (STATE)

Association state is the current, runtime state of the association.

There are eight possible association states.

State	*Description*
OPEN	The association is open and idle.
CLOSED	The association is closed.
OPENING	The association is in the process of being opened.
CLOSING	The association is in the process of being closed.
SENDING	A message is being sent on the association.
RECEIVING	A message is being received on the association.
ERROR	The association cannot be opened.
ABORTED	The association has been aborted.

Example Displays

User input is shown underlined.

```
DISPLAY-ASSOC -Default          Or    DA -Default      Or    DA -D

Adjacent_mta : NODE1
NAME              OWNER     TYPE       STATE
ASSOC1            REMOTE    MONOLOG    CLOSED
ASSOC2            TEMP      MONOLOG    CLOSED
End-Of-Table
```

The DISPLAY_ORNAME Subcommand

The DISPLAY_ORNAME command displays the full O/R address of a specific user, in a tabulated format.

▶ **DISPLAY_ORNAME** $\begin{Bmatrix} \textbf{mail\_id} \\ \textbf{-Default} \end{Bmatrix}$
DOR

Operand	*Description*
mail_id	Displays O/R address data for a specific *mail_id*. This operand updates the default user.
-Default	Displays O/R address data for the *default* user.

O/R Address Components

The following describe the eleven possible address components that can be displayed on your terminal.

Component	*Description*
CTY	Country Name. This is assigned by the X.400 regulatory authorities.
ADM	Administration Domain Name. This is assigned by the X.400 regulatory authorities.
PDM	Private Domain Name.
ORN	Organization Name.
ORU	Organization Unit.
SUR	Surname.
GIV	Given Name.
INI	Initials.
GEN	Generation Qualifier.
DDT	Domain Defined Attribute Type.
DDV	Domain Defined Attribute Value.

Example Displays

User input is shown underlined.

```
DISPLAY-ORNAME BILL              Or     DOR BILL

User : BILL
O/R NAME
CTY : UK
ADM : MHS
PDM : PRIME
ORN : DC
ORU : OSI
SUR : SHAKESPEARE
GIV : WILLIAM
End-Of-Table
```

Messages From DISPLAY_ORNAME

The following message is displayed if the specified User does not exist within the configuration.

```
User <Mail ID> not found.
```

The DISPLAY_QUEUE Subcommand

The DISPLAY_QUEUE command lists the status of send and receive message queues (IN and OUT queues) for users and adjacent MTAs.

▶ **DISPLAY_QUEUE**
DQ

{**-M mta_name** | **-U mail_id** | **-G gate_id** | **-DUser** | **-DMta**} {**-Outqueue** | **-Inqueue** | **-Queue**} {**-Summary** | **-Full**}

There are three categories of operand used by this subcommand; Entities, Queues and Display Levels.

Entity Operands

Operand	*Description*
-M mta_name	Displays the queue status of a specific adjacent MTA. This option resets the default MTA.
-U mail_id	Displays the queue status of a specific mail_id. This option resets the default user.
-G gate_id	Displays the queue status of a specific gate_id. This option resets the default gateway.

-DUser Displays the queue status of the default user.

-DMta Displays the queue status of the default adjacent MTA.

Queue operands

-Outqueue Displays the status of the out, or send queue. This option resets the display default queue type.

-Inqueue Displays the status of the in, or receive queue. This option resets the display default queue type.

-Queue Displays the existing default queue type.

Display Level Operands

There are two operands which enable you to determine the type of display required.

-Summary Displays the following information:

- Queue type (IN/OUT)
- Total number of messages on the queue
- Numbers of high, medium, and low priority (URGENT, NORMAL, NON-URGent) messages

-Full Displays the Summary information, plus the following fields of information:

- MSG ID: A serial number that identifies the message uniquely.
- DATE and TIME: The date and time the message was added to the queue.
- TYPE: There are four message types; these are described below.

Type	*Description*
IM-UAPDU	Interpersonal Message in a User Agent Protocol Data Unit.
SR-UAPDU	Status Report in a User Agent Protocol Data Unit. This is user acknowledgement to the system.
DR-MPDU	Delivery Report in a Message Protocol Data Unit. This is system acknowledgement to the user.

PR-MPDU	Probe Report in a Message Protocol Data Unit. This is system message to verify an MHS route.

For further information about message types, refer to the CCITT X.400 series documentation.

- PRIORITY: Message priorities are NORMAL, URGENT, and NON-URGent.
- ISSUE: The issue state. A message can be off or on. On issue means that the message is being actively processed by Prime X.400.

Example Displays

User input is shown underlined.

```
DISPLAY-QUEUE -Outqueue -Summary                    Or    DQ -O -S

User : BILL
Queue: OUT Tot: 0000 High: 0000 Normal: 0000 Low: 0000

DISPLAY-QUEUE -Inqueue -Full                        Or    DQ -I -F

User  : BILL
Queue : IN Tot: 04 High: 01 Normal: 02 Low: 01
MSG-ID  DATE        TIME       MSG-TYPE   PRIORITY  ISSUE
0012    01:15:89    10:25      IM-UAPDU   NORMAL    ON
End-Of-Table
```

Control Subcommands

This section describes the ADMIN_400 control subcommands, X400_LOGGING and X400_TERMINATE. You use the commands to

- Control the display of error messages at the operator's terminal
- Stop the X400 Server

The X400_LOGGING Subcommand

Error messages from Prime X.400 are normally logged only in the Prime X.400 journal (COMO) log. When error logging is enabled, error messages are also echoed to the terminal.

The X400_LOGGING command enables and disables full error logging at the user's terminal. It is also used to display logging status.

▶ **X400_LOGGING L** { **-Current** | **-Begin** | **-End** }

Operand	*Description*
-Current	Displays current logging status (enabled or disabled)
-Begin	Enables error logging to the user's terminal
-End	Disables error logging to the user's terminal

The X400_TERMINATE Subcommand

The X400_TERMINATE subcommand stops the Prime X400 Server.

▶ **X400_TERMINATE**

There are no operands for this subcommand.

All users who are logged on, are logged off; associations to other MTAs are severed, and the Server is logged out.

PART II
EXAMPLES

4

CONFIG_X400 EXAMPLES

Introduction

This chapter details the step-by-step procedure of how to set the following configurations:

- Set local domain and default configurations
- Configure a single local MTA, including new Users and Gateways
- Add other local MTAs
- Configure a remote MTA
- Configure large numbers of local users
- Define an alternative mail recipient

Each sequence is shown with examples of the screen dialogue.

Refer throughout this chapter to Chapter 2, PRIME X.400 CONFIGURATION, for further details.

Option Selection and Data Input

On the menus and forms that follow, select options by either positioning the cursor or highlight bar on the required option, and pressing TRANSMIT, or, typing the option number and pressing TRANSMIT.

Select an entry from a list by positioning the cursor or highlight bar on the required entry and pressing TRANSMIT.

On Data Input forms, use the tab, back tab, or arrowed cursor keys, to move from field to field; use the TRANSMIT key to save your data.

Use the EXIT key to terminate a function, and to return to a higher level menu or form.

EXAMPLE I - Setting Configuration Defaults

This example shows in stages, how you Set Configuration Defaults for a new configuration. Each stage of the configuration is briefly described, below, indicating the data you are required to supply for that stage, such as *filenames* and *field names.* Detailed descriptions of this data, are found at the relevant points throughout this example.

Stages in Setting Configuration Defaults

1. Invoke CONFIG_X400 Command.

   Data required for this stage:

   The new configuration *filename.*
   The terminal type

2. Set (Local) Global Domain.

   Data required for this stage:

   Country.
   ADMD.
   PRMD.

3. Define subnetwork addresses.

   Data required for this stage:

   Subnetwork Name.
   Destination Protocol ID.
   Destination Facility.
   Source Address.
   Source Protocol ID.

4. Define MTA associations.

   Data required for this stage:

   Temporary, local and remote - Number of associations, subnetwork names, and timeout periods.

   Permanent, local and remote - Number of associations, and subnetwork names.

5. Verify configuration.
6. Save configuration.
7. You may enter a comment pertinent to your configuration. (Optional)

8. List configuration. Determine if you are going to overwrite or append any existing file.
9. Start Prime X.400

Figure 4-1 illustrates the hierarchy of screen forms that you navigate to set configuration defaults.

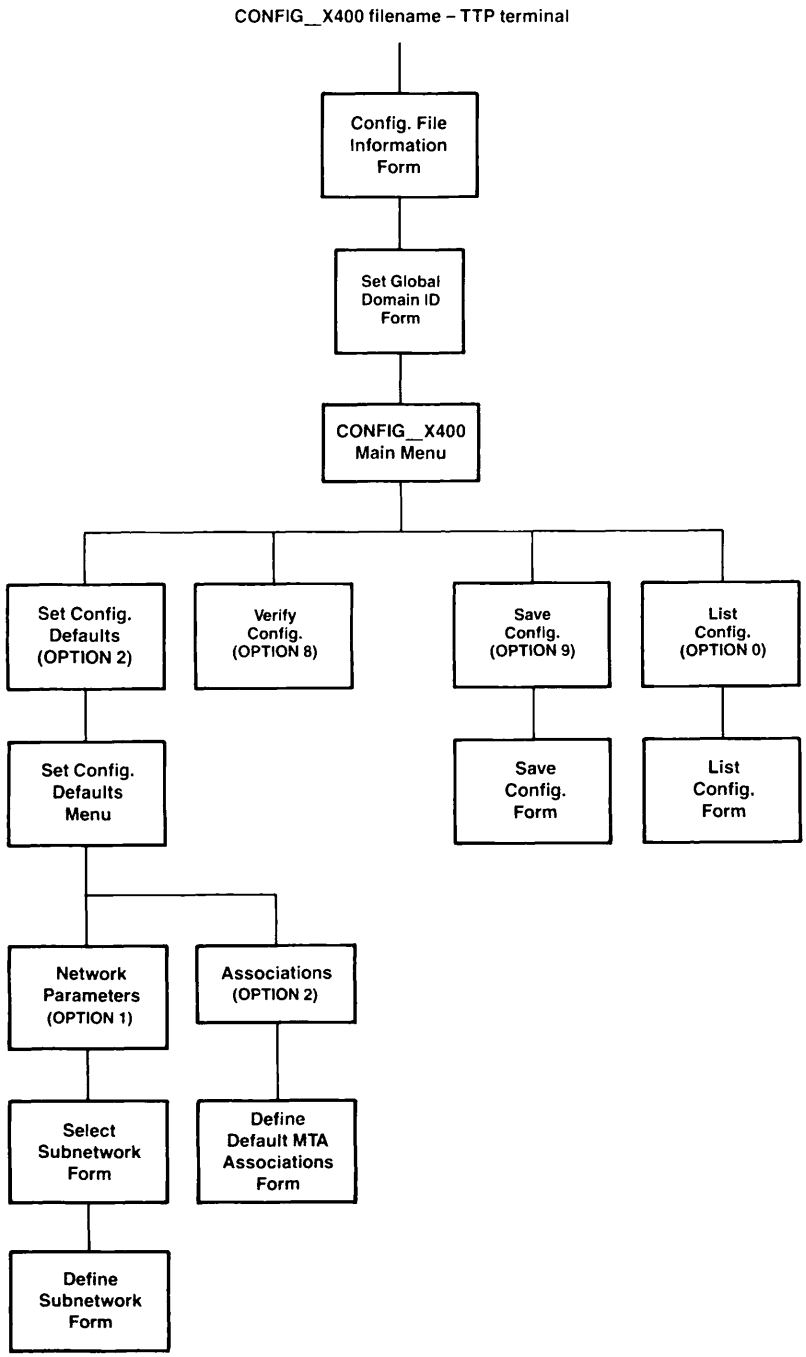

FIGURE 4-1. Hierarchy to Set Configuration Defaults

Stage 1 - Invoke CONFIG_X400 Command

To start your configuration, type the following command at the supervisor terminal, then press TRANSMIT:

```
CONFIG_X400 new_filename -TTP terminal_type
```

Variable	*Description*
new_filename	The name of the new configuration file to be created. If you omit the filename, the default configuration file is used. For this example, the new file is called EXAMPLE.CONFIG.
terminal_type	Specifies the terminal type you are using. Typical Prime terminal-types supported are PT45 PT200 PT200W (132 Character wide terminal) PT200-C (PT200 color terminal) PT200W-C (132 character wide, color terminal) PST100 If you have a .TERMINAL_TYPE$ global variable defined, then this option can be omitted.

The Configuration File Information form is displayed, showing your new filename, as shown in Figure 4-2. All other fields are blank.

```
Config File: EXAMPLE.CONFIG

Revision Number:
Last Updated   :
Updated by user:
Updated on node:

Comment:
```

FIGURE 4-2. Configuration File Information Form

The following prompt is displayed on screen:

```
Config file does not exist.
Do you wish to create a new configuration? (y/n):
```

Type Y. You are presented with the Set Global Domain ID form, as shown in Figure 4-3.

Stage 2 - Set the (Local) Global Domain

Enter your data in the relevant fields; sample entries are shown.

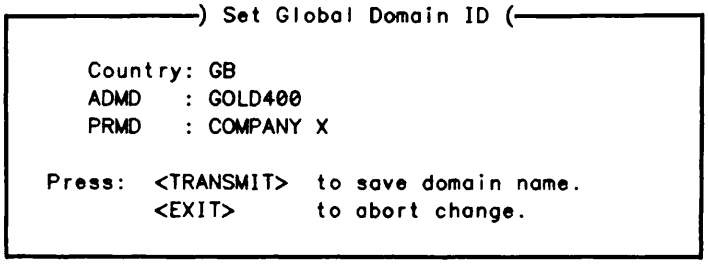

FIGURE 4-3. Set Local Global Domain Form

Field	*Description*
Country	The country in which the network operates. Specify either a 3-digit or 2-letter code. (For example, GB or 234, or... US or 311).
ADMD	The main administration domain with which you are associated. (For example, a public service mail system name, or a mutually agreed name, or leave blank.) Maximum of 16 characters.
PRMD	The private administration domain with which you wish to be associated. If you are associated with an ADMD, the PRMD may be defined by the administration of the ADMD. If you are connecting to a private message handling system, agree the name with the administrator responsible for the system. Maximum of 16 characters.

To save your local domain data, press TRANSMIT.

The CONFIG_X400 Main Menu is displayed, as shown in Figure 4-4.

Note

If you specified an existing configuration filename in the CONFIG_X400 command, the Configuration File Information form is again displayed, showing the last-updated information, and prompting you to confirm that this is the correct file for modification. Typing N terminates X400 and returns you to PRIMOS. Typing Y presents you with the CONFIG_X400 Main Menu, as shown in Figure 4-4

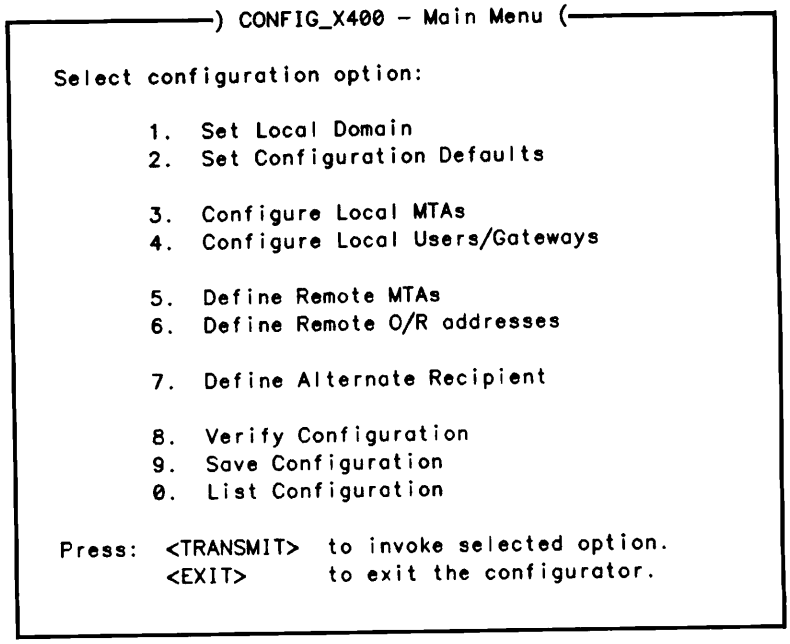

FIGURE 4-4. CONFIG_X400 Main Menu

Select option 2, `Set Configuration Defaults`, from the CONFIG_X400 Main Menu (Figure 4-4), and press TRANSMIT.

You are presented with the Set Configuration Defaults menu as shown in Figure 4-5.

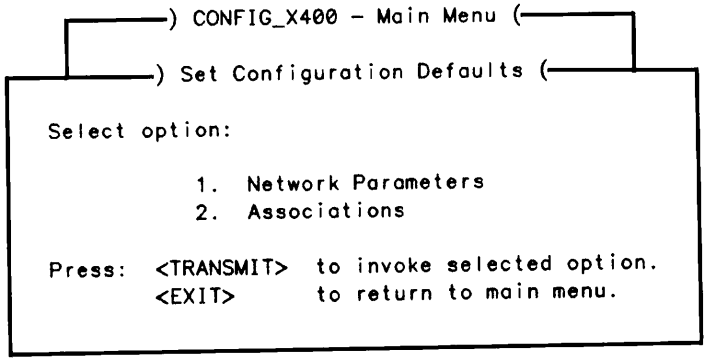

FIGURE 4-5. Set Configuration Defaults Menu

Stage 3 - Define Subnetwork Addresses

Define your subnetwork, so that you can identify the protocols for this MTA simply by specifying the subnetwork name. In this example, the name GALAXY is used.

To define subnetwork addresses, select option 1, Network Parameters from the Set Configuration Defaults menu. The Select Subnetwork form is displayed as shown in Figure 4-6.

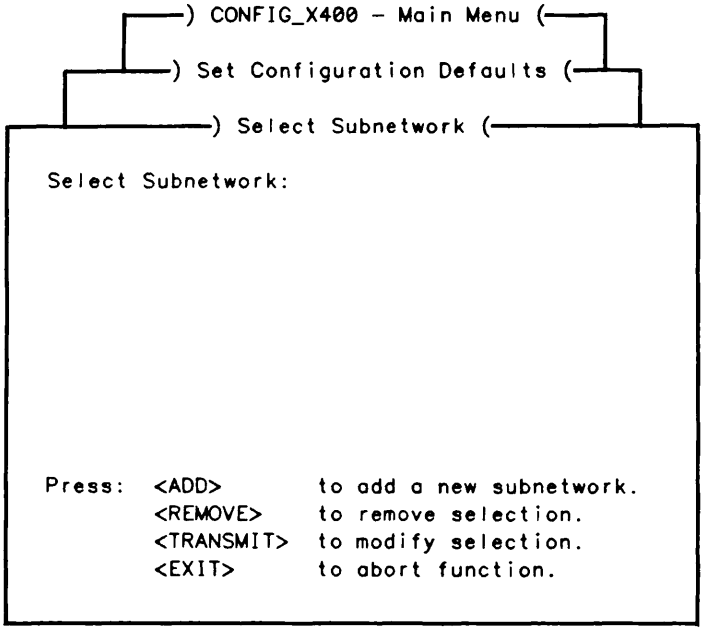

FIGURE 4-6. Select Subnetwork Form

Press ADD to define a new subnetwork. The Define Subnetwork form is displayed, as shown in Figure 4-7.

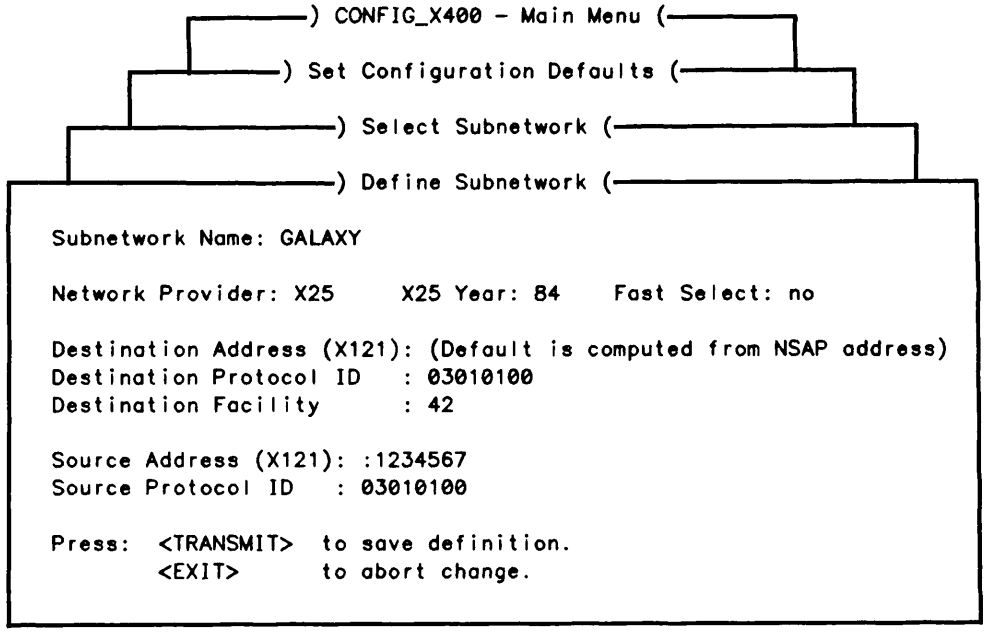

FIGURE 4-7. Define Subnetwork Form

The Define Subnetwork form is used to set up communication parameters between a local Prime MTA and another MTA (local or remote).

The subnetwork definition fields are described in the following list.

Field	*Description*
Subnetwork Name	Your name for the subnetwork.
Network Provider	Always defaults to X25.
X25 Year	Enter the X25 year. Defaults to 1984 (84).
Fast Select	Selects the X25 Fast Select facility. Enter YES or NO. The default is NO.
Destination Address (X121)	The X121 address on outgoing calls. By default, this is computed from the NSAP address.
Destination Protocol ID	The X25 protocol at the destination MTA. Enter four bytes of Hex.
Destination Facility	The X25 Facilities to define when to make an X25 call to the remote system which operates the Remote MTA. For details of how to encode X25 Facilities, refer to the *Primenet Programmer's Guide.* Facilities are not normally required for correct operation.

Source Address (X121) The X121 address for incoming calls.

Enter as a full X121 address, or as an X121 subaddress in the form +<digits> , which is concatenated with the PRIMENET address to form the full X121 address.

Source Address should be distinct from any subaddress used for PRIMENET Route-through.

Source Protocol ID The X25 protocol at the source MTA. Enter four bytes of Hex.

Complete the Define Subnetwork form and press TRANSMIT. The Select Subnetwork form is resumed, displaying the subnetwork just created.

Stage 4 - Define MTA Associations

An association is a connection (a logical link) to another MTA, whether it is local or remote. There are two types of association between MTAs; temporary and permanent.

A temporary association allows you to send messages to an MTA and has a timeout period, in cases of inactivity. The maximum number of associations for both local and remote MTAs is 999. The maximum timeout is 999 minutes.

A permanent association does not have a timeout period. Messages can be sent to an MTA and, if that MTA does not respond, the messages are held in the server until connection is resumed. The maximum number of associations for both local and remote MTAs is 999.

By default, all local nodes/MTAs are mutually interconnected with a single temporary association between each.

Select option 2, `Associations` from the Set Configuration Defaults menu (Figure 4-5). Figure 4-8 illustrates the Define Default MTA Associations form.

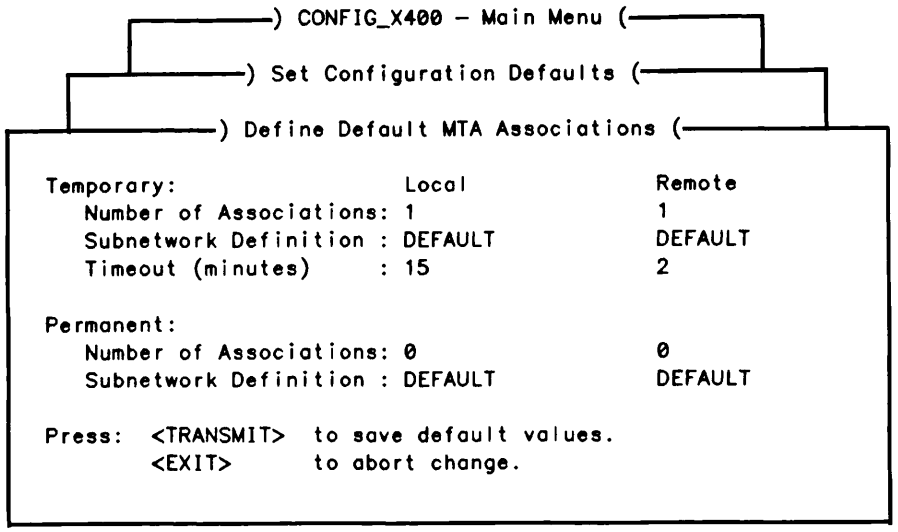

FIGURE 4-8. Define Default MTA Associations Form

Complete the details on the Define Default Associations form by specifying the number of temporary and permanent associations required for local and remote MTAs and, the type of subnetwork involved.

For temporary associations only, specify the inactivity timeout period (temporary associations are only maintained while messages are being exchanged).

When you have completed the form, press TRANSMIT to save the details, and return to the CONFIG_X400 Main Menu.

Stage 5 - Verify Configuration

To check that all information has been entered correctly, select option 8, `Verify Configuration` from the CONFIG_X400 Main Menu, Figure 4-4.

While verification is taking place, one of the following messages may appear on screen:

```
Verifying configuration... please wait...
```

Or

```
Validation complete.  No errors.
```

Press the EXIT key to return to the Main Menu.

Note

If the verification fails, the configuration is invalid and cannot be used to start Prime X.400 on the system. Repeat Stages 1 - 4 to check and/or modify your input, then repeat Stage 5 to verify the data.

Stage 6 - Save Configuration

Select option 9, Save Configuration from the CONFIG_X400 Main Menu (Figure 4-4). You are presented with the Save Configuration form as illustrated in Figure 4-9.

```
) CONFIG_X400 - Main Menu (
) Save Configuration (

Configuration File: EXAMPLE.CONFIG

Comment: First configuration example

Press:  <TRANSMIT>  to save configuration.
        <EXIT>      to abort save.
```

FIGURE 4-9. Save Configuration Form

Enter your new configuration filename and complete the Configuration Form by entering a comment (if required) and pressing TRANSMIT to save the data. You are prompted to create the file. Type Y.

Press the EXIT key to return to the Main Menu.

Stage 7 - List Configuration

A listing of the configuration file can be produced for spooling to a printer, using option 0, List Configuration from the CONFIG_X400 Main Menu, (Figure 4-4).

Figure 4-10 illustrates the List Configuration form.

```
) CONFIG_X400 - Main Menu (
) List Configuration (

Listing filename: EXAMPLE.LIST

       Overwrite: YES
          Append: no

Press:  <TRANSMIT>  to start listing to file.
        <EXIT>      to return to main menu.
```

FIGURE 4-10. List Configuration Form

Press the TRANSMIT key to create the listing.

Press the EXIT key to return to the Main Menu.

Press the EXIT key to terminate CONFIG_X400 and return to PRIMOS.

Stage 8 - Start PRIME_X400

With Stages 1 through 7 completed, you can use your new configuration to start PRIME_X400 on the system by typing the following command at the supervisor terminal:

```
ADMIN_X400 -START -CONFIG example.config
```

EXAMPLE II - Configuring a Single Local MTA

This example shows in stages, how to configure a single local MTA, in order that Prime X.400 can become operational on a single node. Each stage of the configuration is briefly described, below, indicating the field entries you will be required to supply for that stage. Detailed descriptions of these fields, will be found at the relevant points, throughout this example.

Stages in Configuring a Single Local MTA

1. Invoke CONFIG_X400 Command (Refer to Stage 1 of EXAMPLE I - Setting Configuration Defaults)
2. Define a local MTA.

   Field entries required for this stage are:

   MTA Name.
   Organization.
   Organization Unit(s).

3. Configure local users.

   Field entries required for this stage are:

   Users Mail ID.
   Surname.
   Given Name.
   Initials, and Generation Qualifier (Optional)
   Other field entries default to previously defined values.

4. Configure Local Gateways.

   Field entries required for this stage are:

   Gateway Mail ID.
   Surname.
   Given Name.
   Initials, and Generation Qualifier (Optional)
   Other field entries default to previously defined values.

5. Verify, save and list your configuration. (Refer to Stages 5, 6, and 7 of Example I)
6. Start Prime X.400. (Refer to Stage 8 of EXAMPLE I)

Figure 4-11 illustrates the hierarchy of screen forms that you navigate to configure a local MTA.

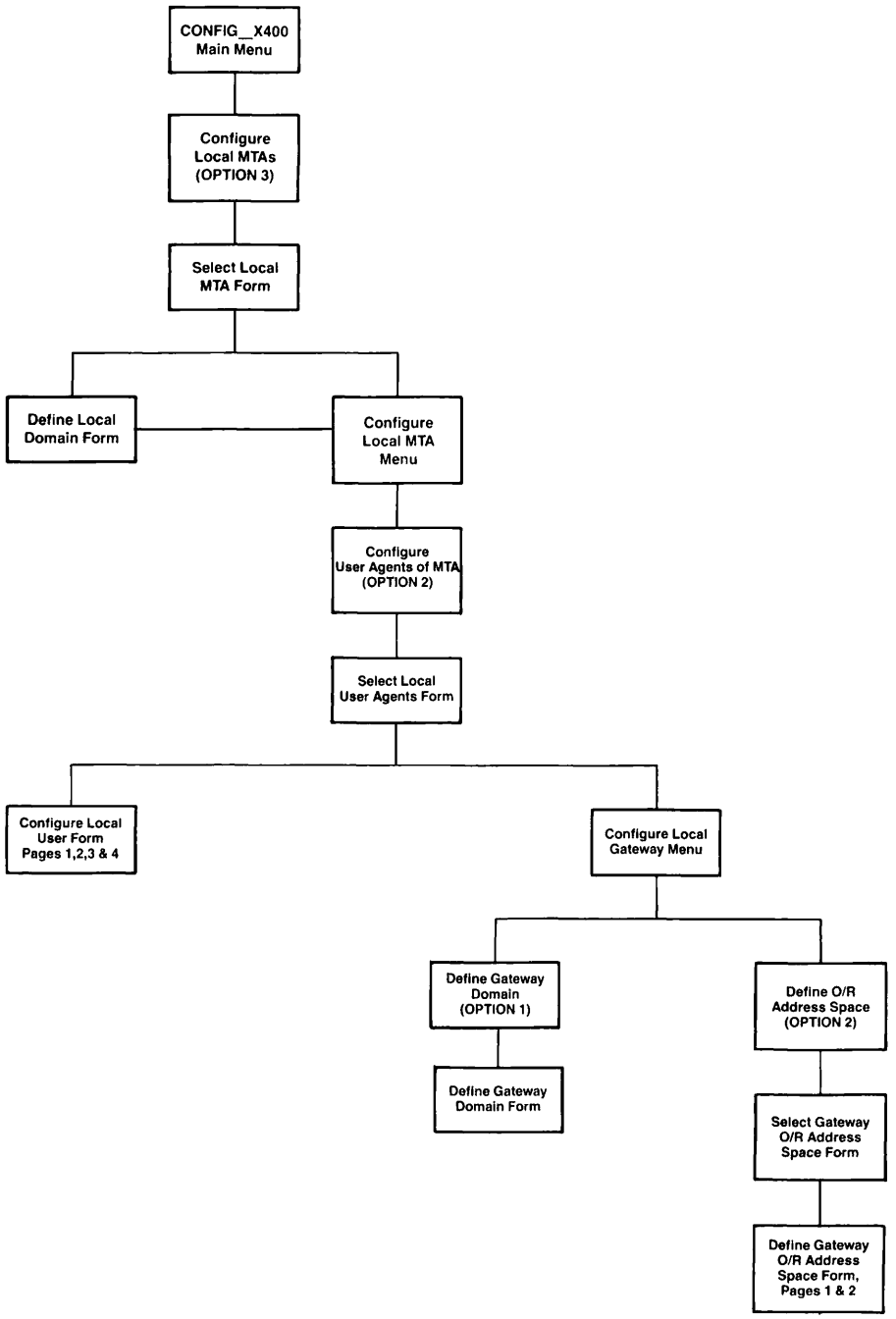

FIGURE 4-11. Hierarchy to Configure a Local MTA

Local MTAs

The Prime X.400 administrator is responsible for configuring Prime X.400 on a single node, or a group of local nodes, such as a local network. The MTAs that the administrator defines within this group, are known as the local MTA group.

MTAs in the same local group share a set of default attributes, such as the type of logical link between them, the association, or the default address space, the domain, and inter-MTA passwords.

The following information can be optionally specified when configuring local MTAs:

- Network addresses
- Associations between local MTAs
- Passwords
- Service protocols and routing information
- MTA names
- User and gateway X.400 addresses and MTA attachments

Stage 1 - Invoke CONFIG_X400 Command

Refer to the previous section, EXAMPLE I - Setting Configuration Defaults, Stage 1.

Stage 2 - Define a Local MTA

Select option 3 - `Configure Local MTAs` from the CONFIG_X400 Main Menu and press TRANSMIT. You are presented with the Select Local MTA form as shown in Figure 4-12. The `Select MTA:` field remains blank until an MTA is defined.

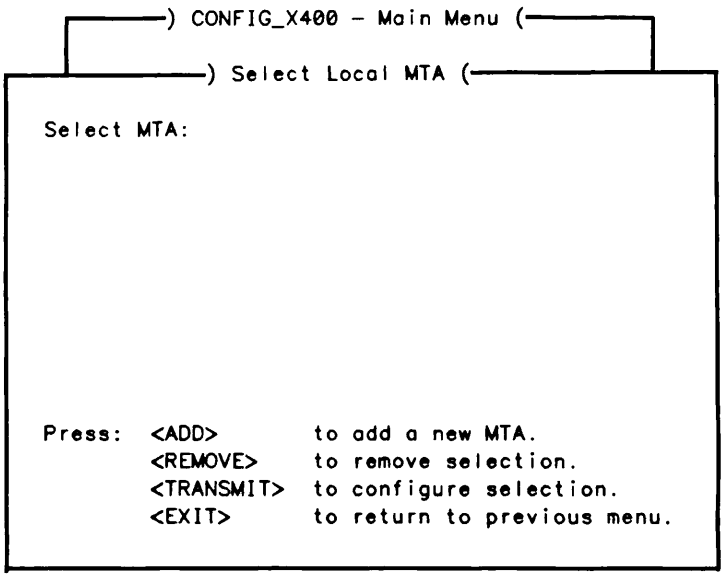

FIGURE 4-12. Select Local MTA Form

To define a local MTA, press ADD. You are presented with the Define Local Domain form, as shown in Figure 4-13. Sample entries are shown.

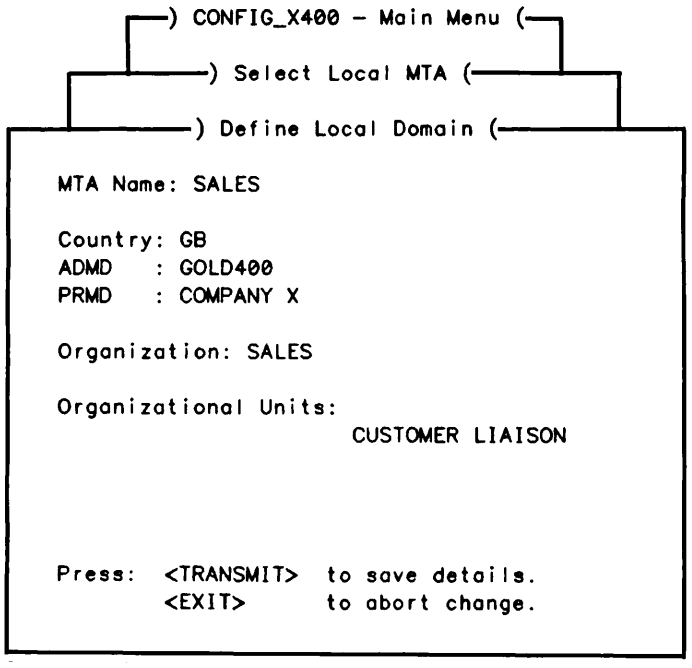

FIGURE 4-13. Define Local Domain Form

You must define the local domain by entering an MTA name and optionally, the organization and organizational units.

Field	*Description*
MTA Name	Name of the local MTA you wish to create. It can contain a maximum of 32 characters.
Organization	A name assigned to an organization within a PRMD. It can contain a maximum of 64 characters.
Organizational Units	Names of units within an organization. Organizational units can contain a maximum of 32 characters.

Note

The fields Country, ADMD, and PRMD, on the Define Local Domain form, take the default values of the configured domain and cannot be altered.

When you have defined the local domain, the Select Local MTA form is resumed and displays the MTA that you have just created.

Stage 3 - Configure Local Users/Gateways

Press the TRANSMIT key to select the MTA you have just created, and the Configure Local MTA menu is displayed as in Figure 4-14. The local MTA name is displayed.

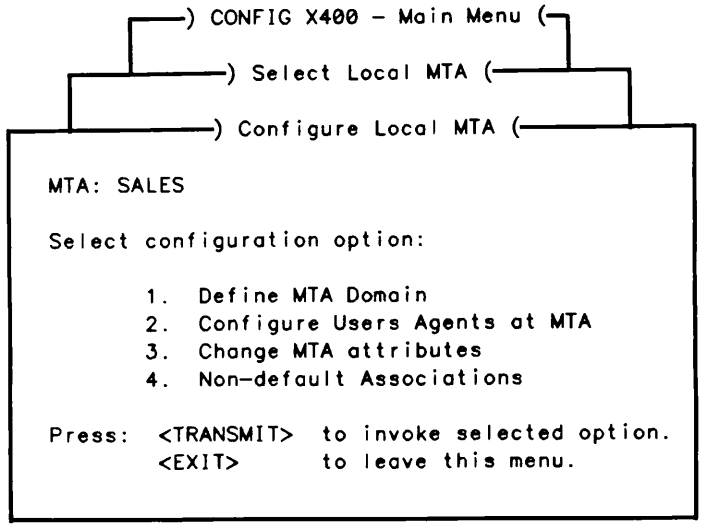

FIGURE 4-14. Configure Local MTA Menu

Select option 2 - Configure Users Agents at MTA from the Configure Local MTA menu, then press TRANSMIT. You are presented with the Select Local User Agents form as shown in Figure 4-15.

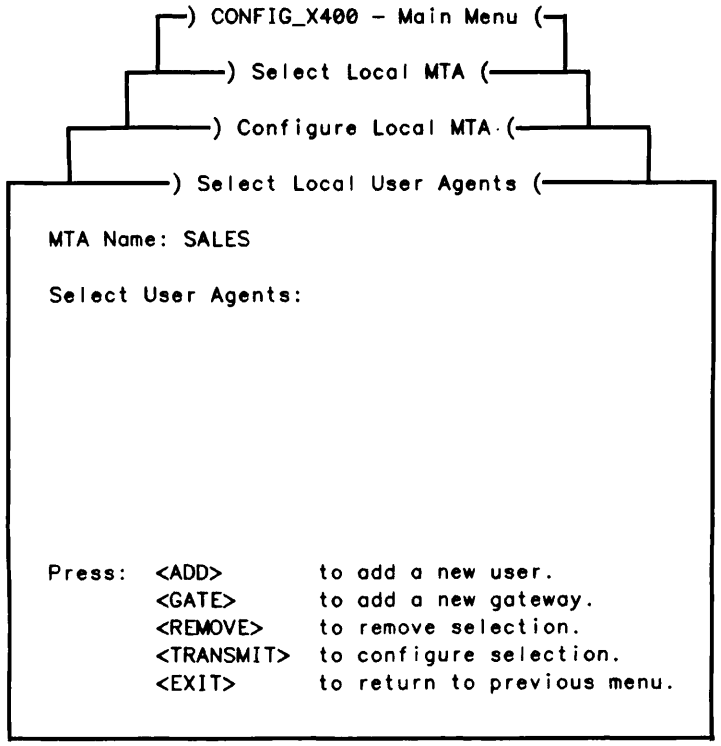

FIGURE 4-15. Select Local User Agents Form

Initially this form is blank. Users, and gateways, are displayed in the `Select User Agents:` field as you add them to the configuration.

Configuring a User

To add a user, press the ADD key. You are presented with Page 1 of 4, of the Configure User form, as shown in Figure 4-16. Sample entries are shown.

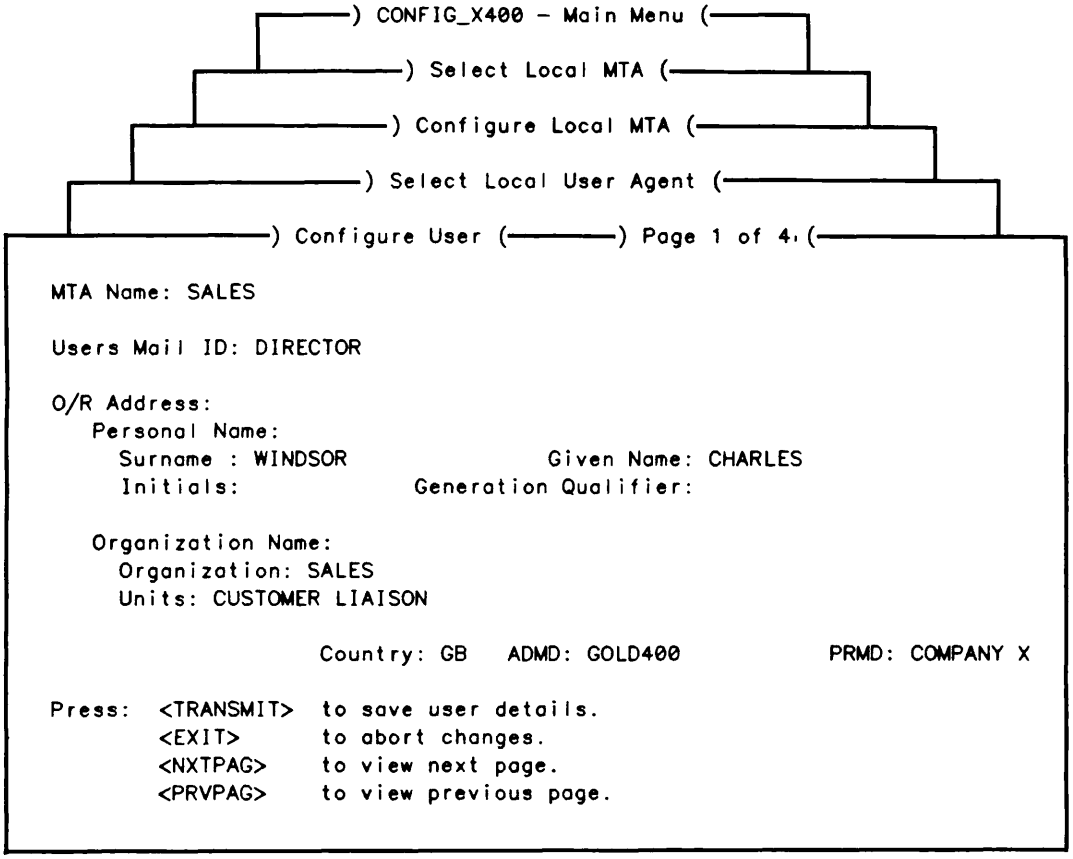

FIGURE 4-16. Configure User Form

O/R address components and their meanings are described in the following list. If Country, ADMD, PRMD, and Organization and Unit(s), have been previously defined in the local MTA domain, they appear as default values. It is possible to overwrite these values, but this results in validation errors when you try to verify the configuration.

Component	*Description*
Country	The country in which the network operates. Specify either a 3 digit, or 2-letter code. For example, GB or 234, or, US or 311.
ADMD	Main administration domains within a country. If you are connecting to an X.400 service provided by a public carrier, use the name they give you. If you are connecting to a private mail application, either choose a name by bilateral agreement, or leave the field blank. The ADMD name can contain a maximum of 16 characters.
PRMD	Private administration domains within a country. For mail applications that connect to ADMDs, negotiate the PRMD with the ADMD administrator.

The PRMD name can contain a maximum of 16 characters.

Organization Name A name assigned to an organization within a PRMD.

The Organization Name can contain a maximum of 64 characters.

Organizational Unit(s) Names of units within an organization. Up to 4 Organizational Units can be defined.

Organizational Units can contain a maximum of 32 characters.

Personal Name A collection of names that identify an individual mail service user:

Surname - 40 characters
Given Name - 16 characters
Initials - 5 characters
Generation Qualifier- 3 characters

When you have completed the form, press TRANSMIT to save your data.

The Select Local User Agents form is redisplayed, showing highlighted, the user you have just created. An example of the Select Local User Agents form is shown in Figure 4-17.

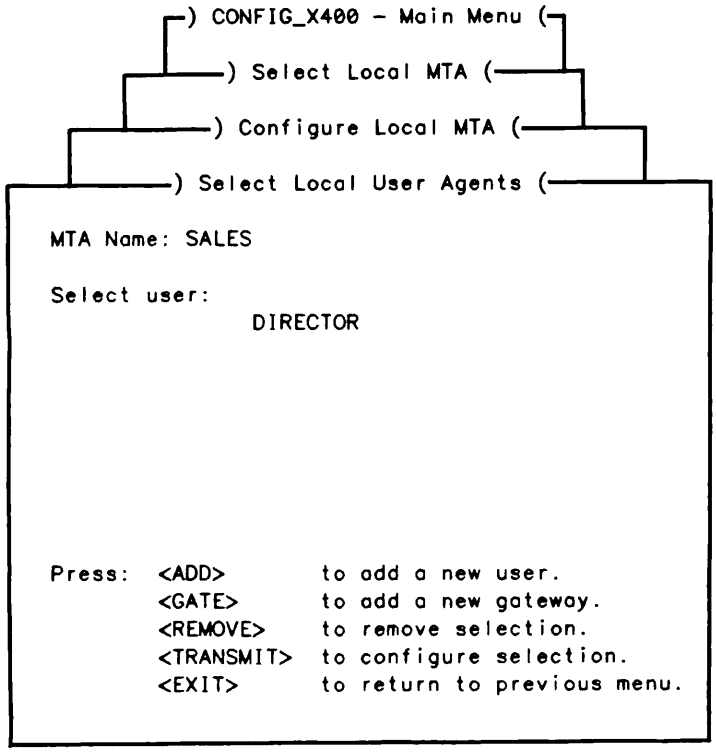

FIGURE 4-17. Select Local User Agents Form

For each user you wish to enter, press ADD, and complete the Configure User form as already described.

Stage 4 - Configuring a Gateway

The Select Local User Agents form is assumed to be displayed, and shows the User Mail ID configured. (See Figure 4-18.)

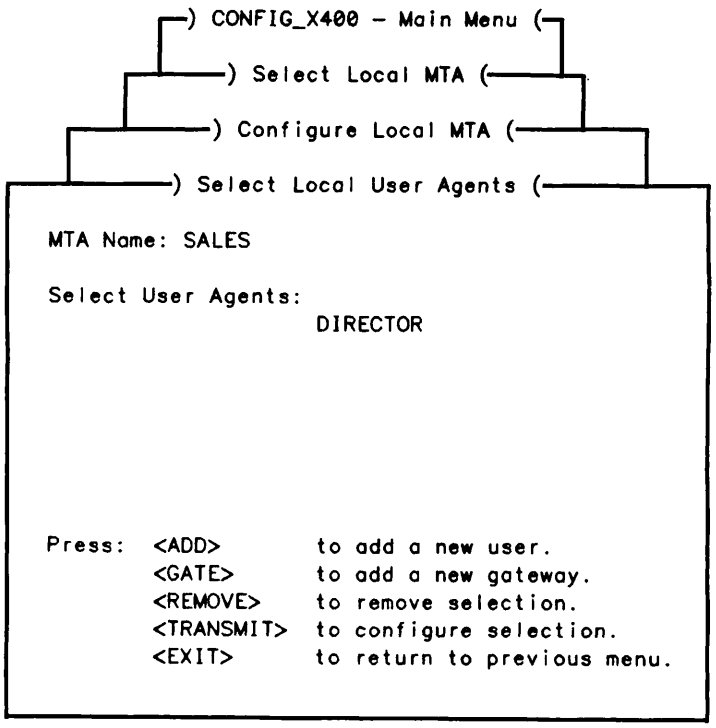

FIGURE 4-18. Select Local User Agents Form

Any existing users and gateways are displayed in the `Select User Agents :` field.

To add a gateway, press the GATE key. You are presented with the Configure Local Gateway menu, as shown in Figure 4-19. The default MTA name is shown. The `Gateway Mail ID` field remains blank until a gateway is defined.

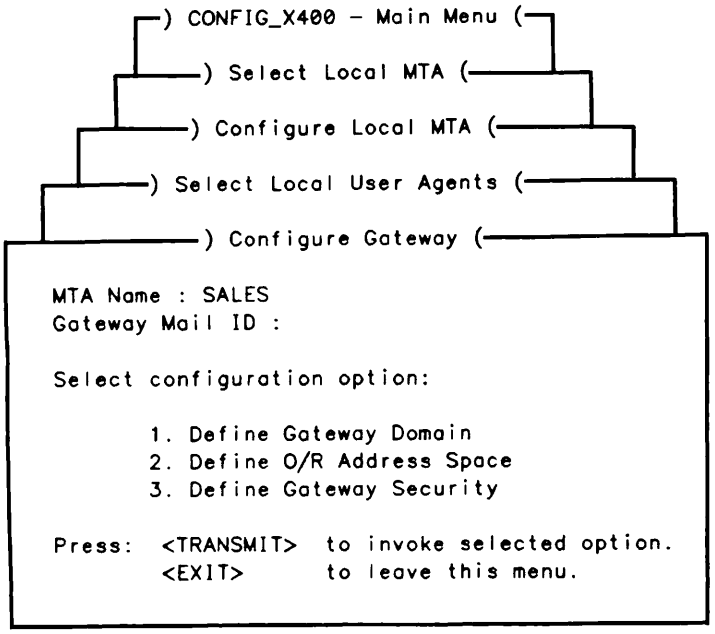

FIGURE 4-19. Configure Local Gateway Menu

Select Option 1, `Define Gateway Domain` and complete the form as shown in Figure 4-20. Sample entries are shown.

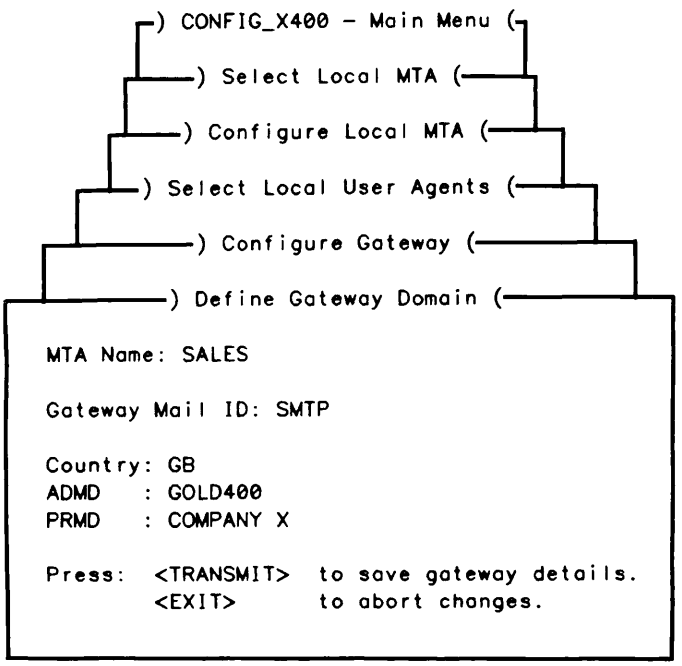

FIGURE 4-20. Define Gateway Domain Form

Define O/R Address Space

Select option 2, `Define O/R Address Space`, of the Configure Local Gateway menu. The Select Gateway O/R Address Space form is displayed, as shown in Figure 4-21

```
) CONFIG_X400 - Main Menu (
) Select Local MTA (
) Configure Local MTA (
) Select Local User Agents (
) Configure Gateway (
) Select Gateway O/R Address Space (

Gateway Mail ID: SMTP

Select O/R Address Space:




Press:  <ADD>       to add a new O/R address space.
        <REMOVE>    to remove selection.
        <TRANSMIT>  to modify selection.
        <EXIT>      to return to previous menu.
```

FIGURE 4-21. Select Gateway O/R Address Space

To add a new O/R adress space, press <ADD>. Page 1 of 2 of the Define Gateway O/R Address Space form is displayed, as shown in Figure 4-22. Sample entries are shown.

Note

It is not necessary to enter a full O/R address; simply supply sufficient attributes to uniquely identify the O/R addresses that can be reached via the MTA.

Meanings and descriptions of O/R address components are described earlier, in the Configure User section of this example.

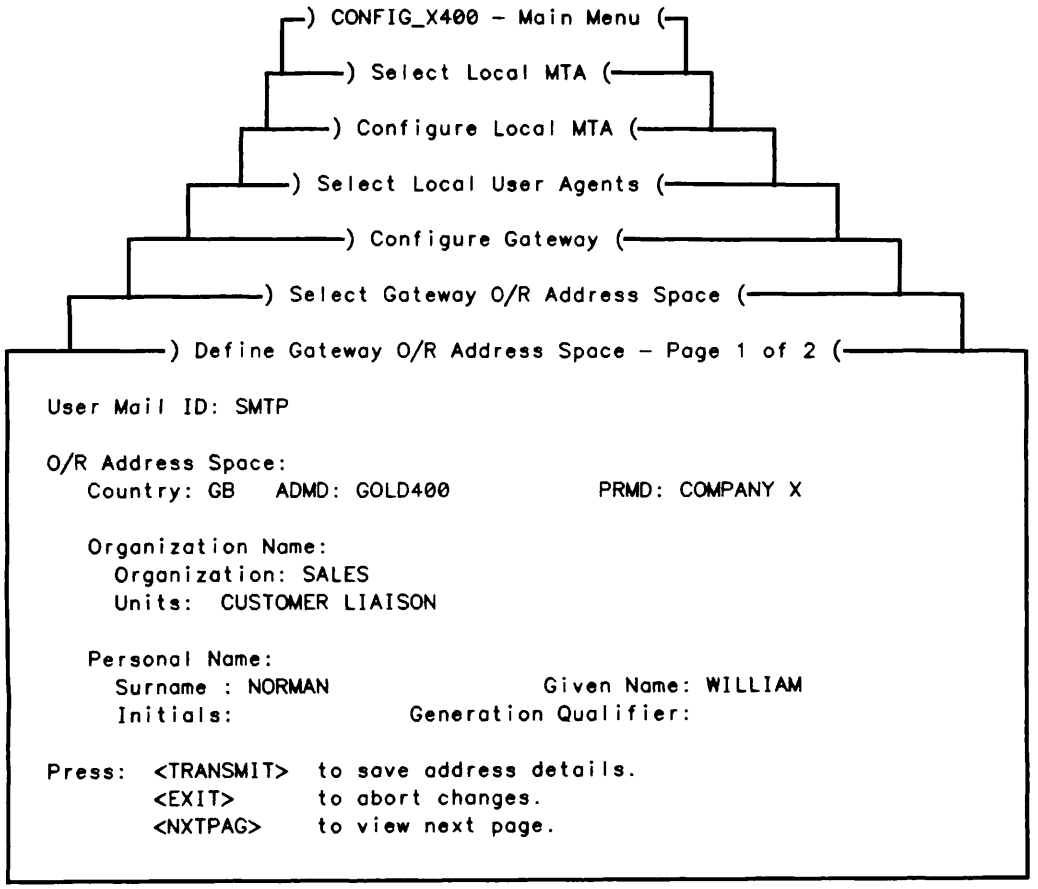

FIGURE 4-22. Define Gateway O/R Address Space Form, Pages 1 & 2

Complete the form and press TRANSMIT to save your data. When the Configure Local MTA menu is redisplayed, press EXIT to return to the CONFIG_X400 Main Menu.

Stage 5 - Verify, Save and List Configuration

Refer to Stages 5, 6 and 7 respectively, of EXAMPLE I - Setting Configuration Defaults.

Stage 6 - Start Prime X.400

Refer to Stage 8 of EXAMPLE I - Setting Configuration Defaults.

EXAMPLE III - Adding a Local MTA

This example shows in stages, how to add other local MTAs to your configuration. Each stage of the configuration is briefly described below, indicating the data you are required to supply for that stage, such as field entries. Detailed descriptions of these fields, can be found at the relevant points throughout this example.

Stages in Adding a Local MTA

1. Invoke CONFIG_X400 Command (Refer to the previous section, EXAMPLE I - Setting Configuration Defaults, Stage 1).
2. Define a local MTA (Refer to the previous section, EXAMPLE II - Configuring a Single Local MTA, Stage 2).
3. Configure local users (Refer to the previous section, EXAMPLE II - Configuring a Single Local MTA, Stage 3).
4. Change the default association between adjacent MTAs, if necessary. Field entries that may be required for this stage are:

   Temporary - Number of Associations
   - Timeout periods

   Permanent - Number of Associations
   - Timeout periods

5. Verify, save and list your configuration. (Refer to Stages 5, 6 and 7 respectively of EXAMPLE I - Setting Configuration Defaults.)
6. Start Prime X.400 (Refer to Stage 8 of EXAMPLE I - Setting Configuration Defaults.)

Figure 4-23 illustrates the hierarchy of screen forms that you navigate to add a local MTA.

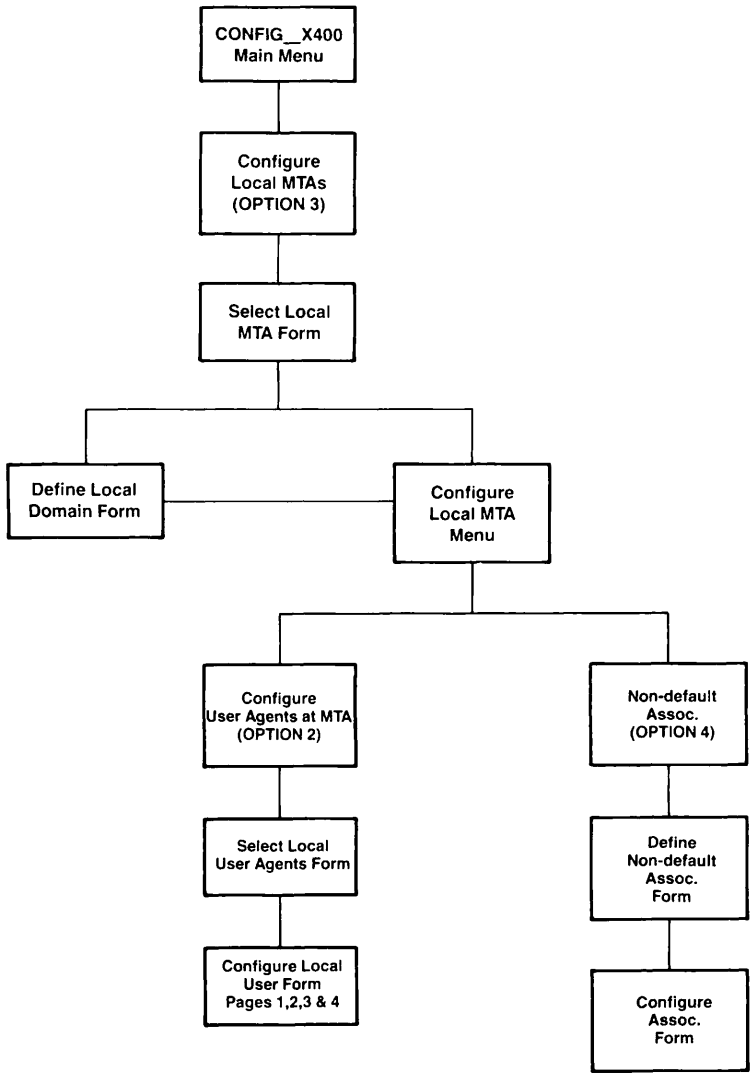

FIGURE 4-23. Hierarchy to Add a Local MTA

Stage 1 - Invoke CONFIG_X400 Command

Refer to the previous section, EXAMPLE I - Setting Configuration Defaults, Stage 1.

Stage 2 - Define a Local MTA

Refer to the previous section, EXAMPLE I - Setting Configuration Defaults, Stage 2.

Stage 3 - Configure Local Users/Gateways

Refer to the previous section, EXAMPLE I - Setting Configuration Defaults, Stage 3.

Stage 4 - Changing Default Associations between MTAs

Select option 4, `Non-default Associations` from the Configure Local MTA menu (Figure 4-14).

You are presented with the Non-default Associations form as shown in Figure 4-24.

Note

The MTA, *ENGINEERING*, must be assumed to have been configured prior to this example; that is, there must be at least one other configured MTA for there to be an association.

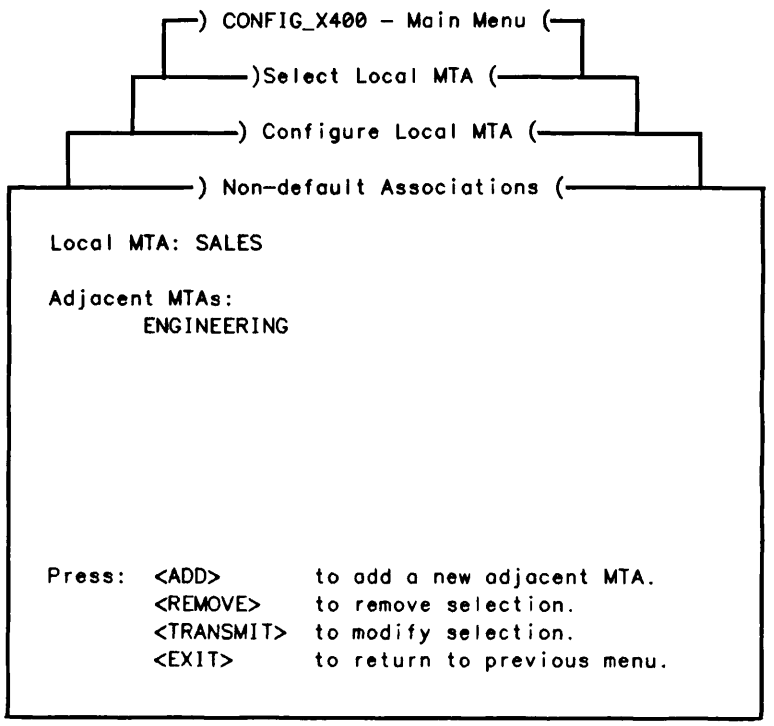

FIGURE 4-24. Non-default Associations Form

Press TRANSMIT to modify the association. You are presented with the Configure Associations form as shown in Figure 4-25.

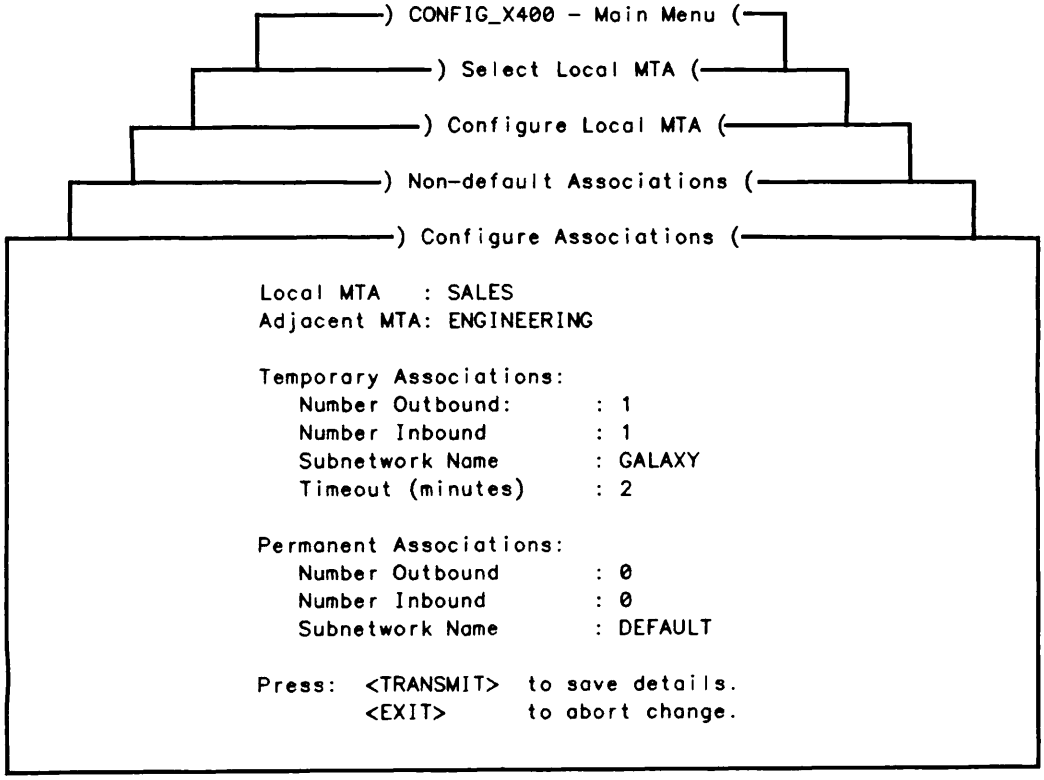

FIGURE 4-25. Configure Associations Form

Enter the subnetwork name in the correct field on this form, and press TRANSMIT. Defining the subnetwork name is shown within Stage 3, Define Subnetwork Address, of EXAMPLE I - Setting Configuration Defaults.

Stage 5 - Verify, Save and List Configuration

Refer to Stages 5, 6, and 7 respectively, of EXAMPLE I - Setting Configuration Defaults.

Stage 6 - Start Prime X.400

Refer to Stage 8 of EXAMPLE I - Setting Configuration Defaults.

EXAMPLE IV - Configuring a Remote MTA

This example shows in stages, how to configure a remote MTA. Each stage of the configuration is briefly described, below, indicating the data you will be required to supply for that stage, such as field entries. Detailed descriptions of these fields, can be found at the relevant points, throughout this example.

Stages in Configuring a Remote MTA

1. Invoke CONFIG_X400 Command (Refer to Stage 1 of EXAMPLE I - Setting Configuration Defaults)
2. Define remote MTA.

   Field entries required for this stage are:

   MTA Name
   Country
   ADMD
   PRMD

3. Define remote MTA O/R address space.

   Field entries required for this stage are:

   Organization
   Organization Unit
   Surname
   Given Name
   Initials and Generation Qualifier (Optional)

4. Define remote MTA attributes.

   Field entries required at this stage are:

   Remote and Local Passwords
   Network Address
   Other field entries default to previously defined values.

5. Define an association between a local MTA and the remote MTA. You must determine the associations for the remote MTA.
6. Verify, save and list your configuration. (Refer to Stages 5, 6, and 7 respectively of EXAMPLE I - Setting Configuration Defaults)
7. Start Prime X.400 (Refer to Stage 8 of EXAMPLE I - Setting Configuration Defaults)

Figure 4-26 illustrates the hierarchy of screen forms that you navigate to configure a remote MTA.

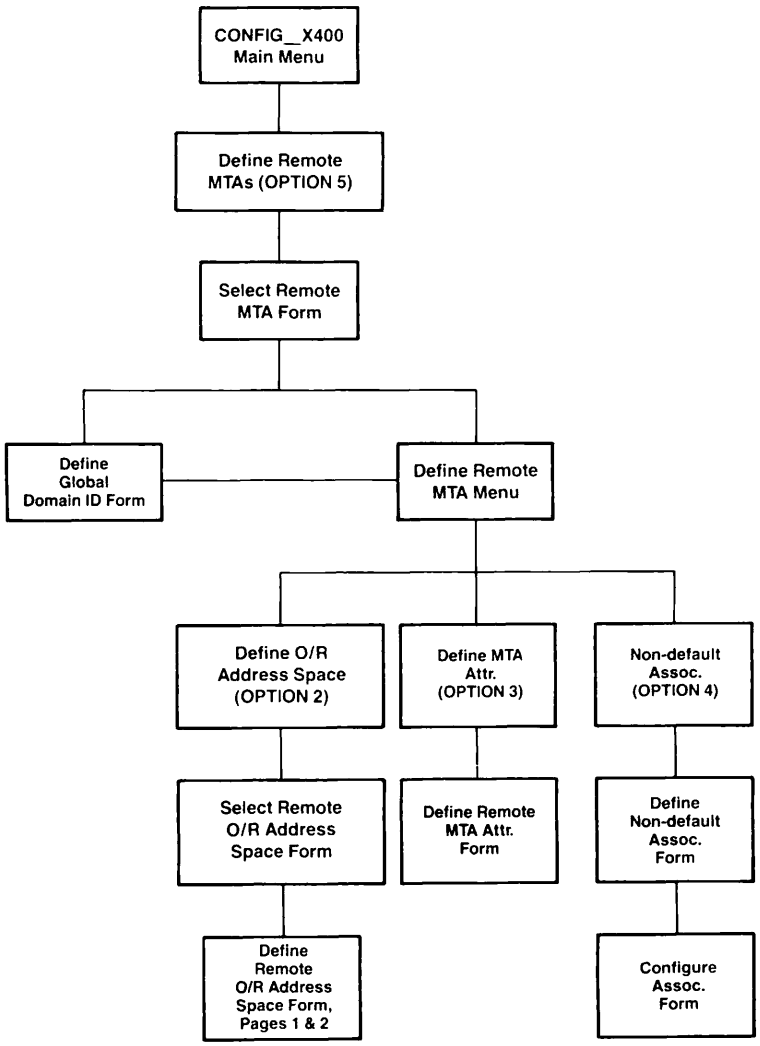

FIGURE 4-26. Hierarchy to Configure a Remote MTA

Remote MTAs

Remote MTAs are outside your immediate control, and act as gateways to other user domains on the X.400 network.

The following information can be optionally specified when defining remote MTAs:

- Network addresses
- Protocols for communicating with the local MTA group
- Remote MTA's domain name
- Remote user/gateway address space (domain) associated with the MTA

Stage 1 - Invoke CONFIG_X400 Command

Refer to Stage 1, of EXAMPLE I - Setting Configuration Defaults.

Stage 2 - Define a Remote MTA

Select option 5, `Define Remote MTAs`, from the CONFIG_X400 Main Menu (Figure 4-4), and press TRANSMIT. You are presented with the Select Remote MTA form as shown in Figure 4-27. The `Select MTA:` field is blank until a remote MTA is defined).

```
) CONFIG_X400 - Main Menu (
) Select Remote MTA (

Select MTA:




Press:  <ADD>       to add a new MTA.
        <REMOVE>    to remove selection.
        <TRANSMIT>  to modify selection.
        <EXIT>      to return to previous menu.
```

FIGURE 4-27. Select Remote MTA Form

To define new remote MTA, press ADD. You are presented with the Define Global Domain ID form as shown in Figure 4-28. Sample entries are shown.

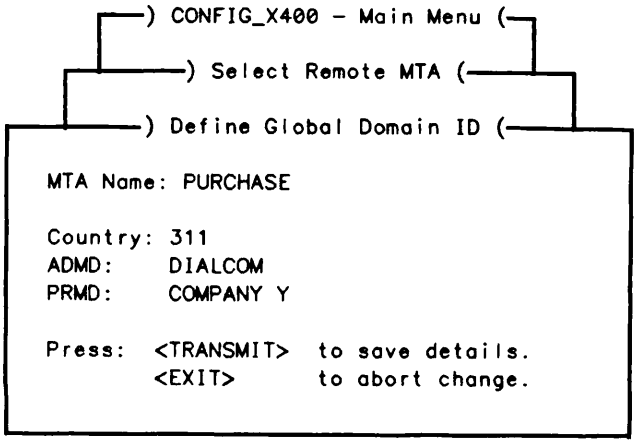

FIGURE 4-28. Define Remote Domain Form

You must define the domain by entering an MTA name, Country, ADMD, and PRMD. (Details of how to complete these fields can be found in the previous section, EXAMPLE II - Configuring a Single Local MTA, Stage 2). Press TRANSMIT to save your data.

The Select Remote MTA form is resumed and displays and highlights the MTA you have created. Use the ADD key to enter more remote MTAs as required.

Stage 3 - Define Remote MTA O/R Address Space

Select an MTA from the Select Remote MTA form by pressing TRANSMIT. You are presented with the Define Remote MTA menu as shown in Figure 4-29. The remote MTA selected is shown.

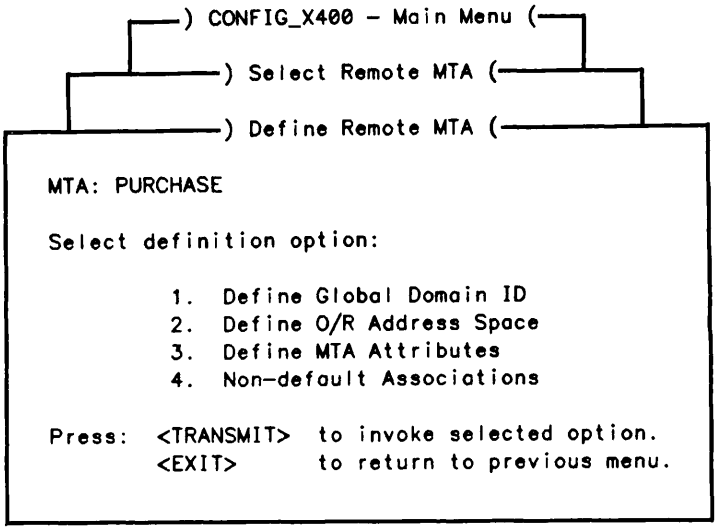

FIGURE 4-29. Define Remote MTA Menu

At this stage, you must define the O/R addresses accessible via the MTA and other MTA attributes. Select option 2, `Define O/R Address Space`. You are presented with the Select Remote MTA O/R Address Space form as shown in Figure 4-30.

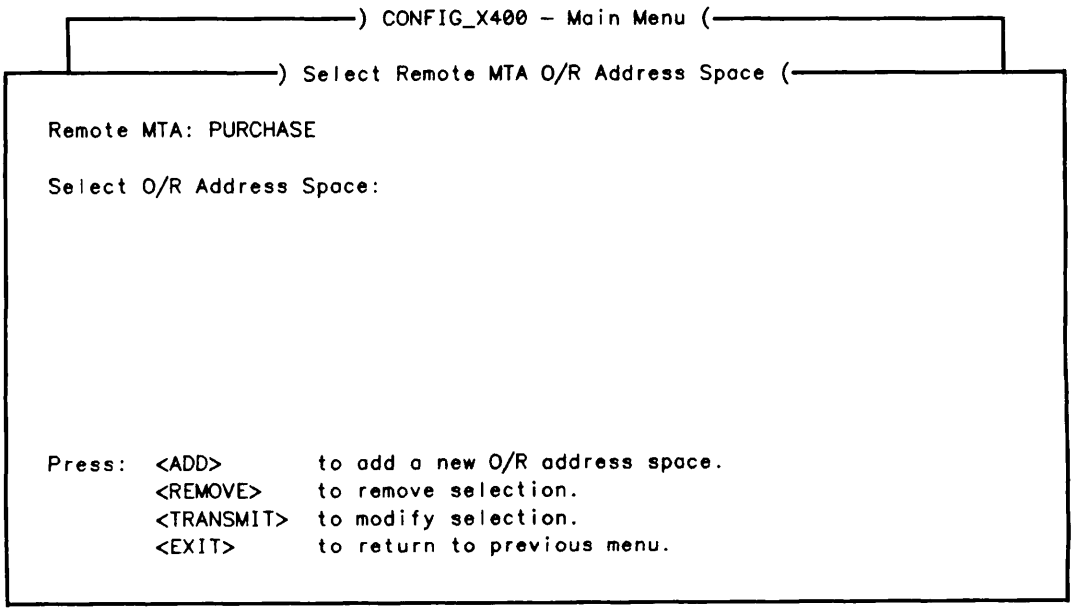

FIGURE 4-30. Select Remote MTA O/R Address Space Form

To enter an O/R address for the remote MTA, press ADD. You are presented with the Select Remote O/R Address Space form as shown in Figure 4-31.

```
) CONFIG_X400 - Main Menu (
) Select Remote MTA O/R Address Space (
) Select Remote O/R Address Space (—) Page 1 of 2 (

MTA: PURCHASE

O/R Address Space:
   Country: 311  ADMD: DIALCOM          PRMD: COMPANY Y

   Organization Name:
     Organization: PURCHASE
     Units: SUPPLIER LIAISON

   Personal Name:
     Surname : JEFFERSON            Given Name: GEORGE
     Initials:            Generation Qualifier:

Press:  <TRANSMIT>  to save user details.
        <EXIT>      to abort changes.
        <NXTPAG>    to view next page.
```

FIGURE 4-31. Select Remote O/R Address Space Form

Note

It is not necessary to enter a full O/R address; simply supply sufficient attributes to uniquely identify the O/R addresses that can be reached via the MTA.

Meanings and descriptions of O/R address components can be found in Stage 3, of Example II, under the section Configuring a User. When you have completed the form, press TRANSMIT.

The Select Remote MTA O/R Address Space form is resumed. Use ADD to enter other O/R addresses, as required.

Stage 4 - Define Remote MTA Attributes

When you have entered the O/R addresses for the MTA, select option 3, `Define MTA Attributes` from the Define Remote MTA menu, Figure 4-29.

You are presented with the Define Remote MTA Attributes form as shown in Figure 4-32.

Remote MTA attributes are described in the following list:

Attribute	*Description*
MTA Name	The name you must use to communicate with the remote MTA. Obtain the name from the MTA's administrator.
Remote Password	The password that identifies the remote MTA. Obtain the password from the remote MTAs' administrator.
Local Password	The password that the remote MTA must supply in order to communicate with the local MTA. It is assigned locally.
Protocol Type	The protocol type used by the remote MTA. Set to either CCITT-84 (the default), or MOTIS.
Network Address	The ISO network address (NSAP) of the MTA. Specify the address in one of the following formats: • Nodename • 15 digits preceded by a colon (X121 address) **Note** If in doubt, allow the default to be selected.
Transport Protocol Selector	Selects the ISO transport protocol. This should be obtained from the remote MTAs administrator. Enter as two hexadecimal digits per byte. For example, if the application uses printable characters, and you agree on the 2-byte code that corresponds to ASCII 17, then you must enter 3137. The maximum permitted size is 32 bytes, and the default value is 3432.

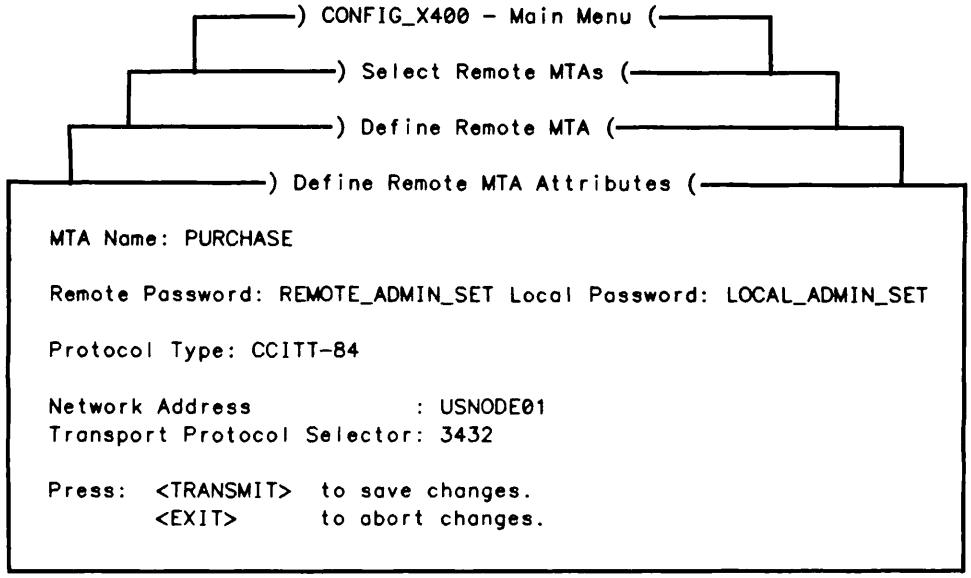

FIGURE 4-32. Define Remote MTA Attributes Form

When you have completed the form, press TRANSMIT.

Stage 5 - Define Association Between a Local MTA and the Remote MTA

When all remote MTAs are defined, the associations between the remote MTAs and the local MTAs must be set up.

Select option 4, `Non-default Associations` from the Define Remote MTA menu (Figure 4-29). You are presented with the Define Non-default Associations form, as shown in Figure 4-33.

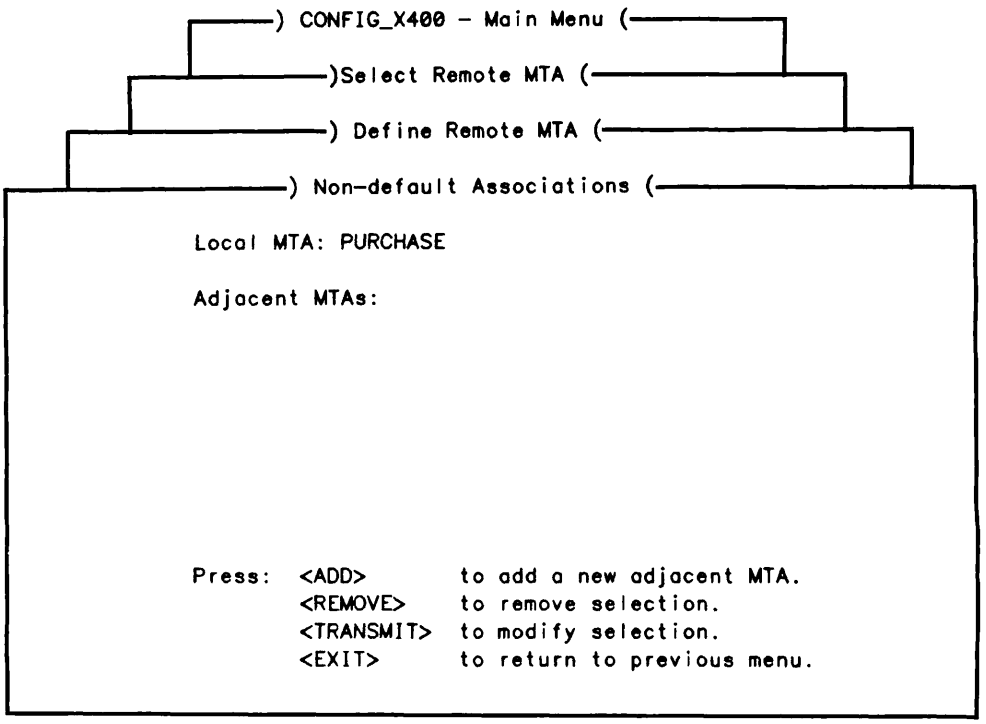

FIGURE 4-33. Define Non-default Associations Form

Press the ADD key. You are presented with a list of all possible MTAs to which the selected MTA may be associated.

Position the cursor to the desired local MTA and press TRANSMIT. Pressing TRANSMIT saves the local MTA and resumes the Define Non-default Associations form.

Further local MTAs can be added by pressing the ADD key.

Stage 6 - Verify, Save and List Configuration

Refer to Stages 5, 6 and 7 respectively of EXAMPLE I - Setting Configuration Defaults.

Stage 7 - Start Prime X.400

Refer to Stage 8 of EXAMPLE I - Setting Configuration Defaults.

EXAMPLE V - Configuring Large Numbers of User Agents

This example shows in stages, how to configure large numbers of users. It is not expected that bulk loading of gateways is required. Each stage of the configuration is briefly described below, indicating the data you are required to supply for that stage, such as the additional User Mail IDs.

Stages in Configuring Large Numbers of Local Users

1. Use CONFIG_X400 Command to create a configuration with all required local MTAs defined. (Refer to EXAMPLES I, II and III.)
2. Edit the text configuration file to add local users.
3. Invoke CONFIG_X400 Command using the configuration just created. (Refer to EXAMPLE I - Setting Configuration Defaults, Stage 1.)
4. Verify, save and list your configuration. (Refer to Stages 5, 6 and 7 respectively, of EXAMPLE I - Setting Configuration Defaults.)
5. Start Prime X.400. (Refer to Stage 8 of EXAMPLE I - Setting Configuration Defaults.)

Figure 4-34 shows the hierarchy of screen forms that you navigate, to configure large numbers of users.

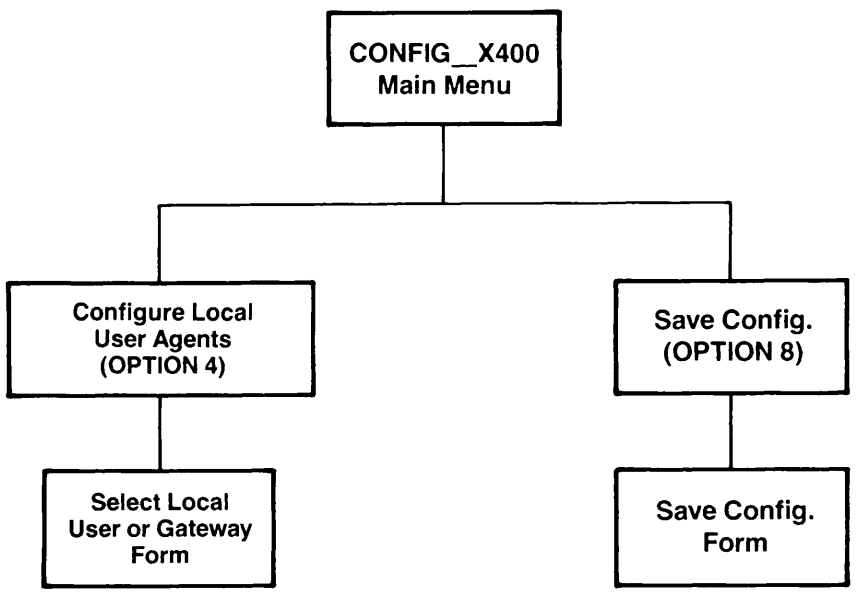

FIGURE 4-34. Hierarchy to Configure Large Numbers of Users

Stage 1 - Invoke CONFIG_X400 Command

Refer to Stage 1 of EXAMPLE I - Setting Configuration Defaults.

Stage 2 - Editing the Text Configuration File

The .CONFIG file is a text file. Figure 4-35, shows part of a .CONFIG file; extraneous data, on the right of the file, has been ignored.

```
#version 3
#date 600438643
#user X400_ADMIN
#node ADMIN
#comment Sample file for examples in Chapter 4
#file EXAMPLE.CONFIG
L "COMPANY X".GOLD400.GB
SND GALAXY X25  -PR 03010100 -SA 1234567 -SP 03
M ENGINEERING -LP UKENG01 -RTS 1 3 1024 1024 -P
M PURCHASE  -LP  "REMOTE ADMIN SET" -RP "LOCAL
M SALES -LP UKSL01 -RTS 1 3 1024 1024 -PR 1 -AD
AS $LOCAL 0 1 15 DEFAULT DEFAULT
AS $REMOTE 0 1 2 DEFAULT DEFAULT
AS ENGINEERING SALES 0 1 15 DEFAULT GALAXY
AS PURCHASE SALES 0 1 15 DEFAULT GALAXY
AS SALES ENGINEERING 0 1 15 DEFAULT GALAXY
AS SALES PURCHASE 0 1 15 DEFAULT GALAXY
U DIRECTOR@SALES CHARLES.WINDSOR%"CUSTOMER LIAI
SE DIRECTOR@SALES SALESUK RECEIVE SEND
U MANAGER@ENGINEERING HENRY.TUDOR%"SOFTWARE DEV
SE MANAGER@ENGINEERING ENGINEERINGUK RECEIVE SE
G SMTP@SALES -CO 1 -DO "COMPANY X".GOLD400.GB
G SMTP@SALES WILLIAM NORMAN%"CUSTOMER LIAISON".
SE SMTP@SALES SALESUK RECEIVE SEND
R PURCHASE GEORGE.JEFFERSON%"SUPPLIER LIAISON".
AR SMTP@SALES
```

This is only part of a .CONFIG file.

Some of the lines shown are not complete.

FIGURE 4-35. .CONFIG File Example

If you have an online list of users, such as a telephone list, that is required within your configuration, then you can use an editing system to modify the list into a form acceptable to the configurator.

Create a list, one user per line, using one of the following formats as a guide:

```
U <User Mail ID>@<MTA>  or <O/R Address>
```

Append the list to the bottom of the .CONFIG file. Figure 4-36 shows an edited .CONFIG file with two additional users. Please note that data, extraneous to this example and on the right of the file, has been ignored.

```
#version 3
#date 600438643
#user X400_ADMIN
#node ADMIN
#comment Sample file for examples in Chapter 4
#file EXAMPLE.CONFIG
L "COMPANY X".GOLD400.GB
SND GALAXY X25  -PR 03010100 -SA 1234567 -SP 03
M ENGINEERING -LP UKENG01 -RTS 1 3 1024 1024 -P
M PURCHASE  -LP  "REMOTE ADMIN SET" -RP "LOCAL
M SALES -LP UKSL01 -RTS 1 3 1024 1024 -PR 1 -AD
AS $LOCAL 0 1 15 DEFAULT DEFAULT
AS $REMOTE 0 1 2 DEFAULT DEFAULT
AS ENGINEERING SALES 0 1 15 DEFAULT GALAXY
AS PURCHASE SALES 0 1 15 DEFAULT GALAXY
AS SALES ENGINEERING 0 1 15 DEFAULT GALAXY
AS SALES PURCHASE 0 1 15 DEFAULT GALAXY
U DIRECTOR@SALES CHARLES.WINDSOR%"CUSTOMER LIAI
SE DIRECTOR@SALES SALESUK RECEIVE SEND
U MANAGER@ENGINEERING HENRY.TUDOR%"SOFTWARE DEV
SE MANAGER@ENGINEERING ENGINEERINGUK RECEIVE SE
G SMTP@SALES -CO 1 -DO "COMPANY X".GOLD400.GB
G SMTP@SALES WILLIAM NORMAN%"CUSTOMER LIAISON".
SE SMTP@SALES SALESUK RECEIVE SEND
R PURCHASE GEORGE.JEFFERSON%"SUPPLIER LIAISON".
AR SMTP@SALES
U SUPERVISOR@ENGINEERING DAVID.KOSHER%
U HEADofDEPT@SALES ROGER.KITSON%
```

This is only part of a .CONFIG file.

Some of the lines shown are not complete.

FIGURE 4-36. Example .CONFIG file with additional Users

Note

Only the personal name attributes of the new users have been entered in the Figure 4-36 example. The full O/R address is constructed by the configurator from the MTA domain name.

Enter the **%** character at the end of each personal name.

Stage 3 - Invoking CONFIG_X400 Command to Check Users

Invoke the CONFIG_X400 command using the .CONFIG file created in Stage 2, and select option 4, `Configure Local User Agents` from the CONFIG_X400 Main Menu, (Figure 4-4.) You are presented with the Select Local User or Gateway form as shown in Figure 4-37. The display should include those users that you have added to the .CONFIG file.

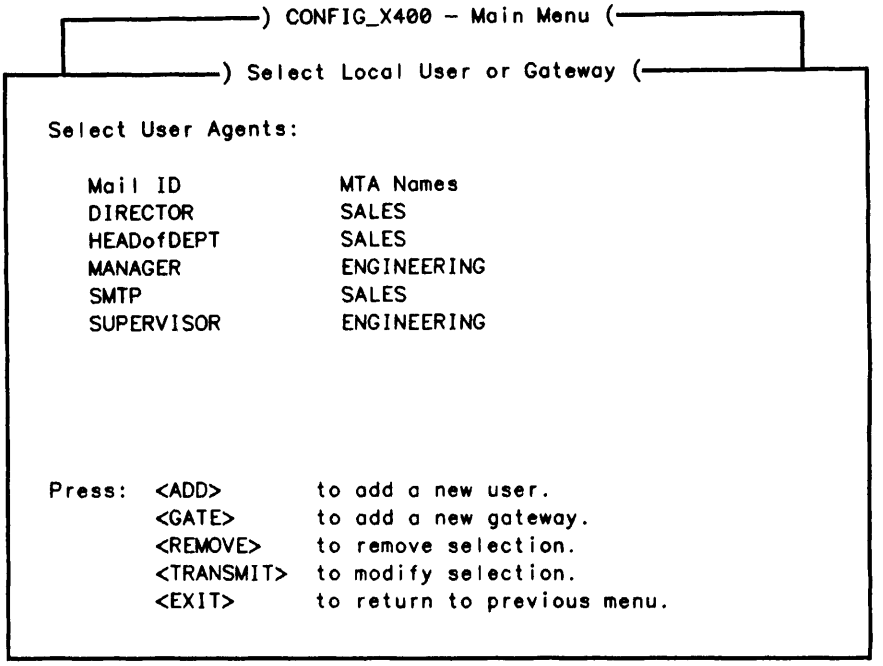

FIGURE 4-37. Select Local User or Gateway Form

Stage 4 - Verify, Save and List Configuration

Refer to Stages 5, 6, and 7 respectively of EXAMPLE I - Setting Configuration Defaults.

Stage 5 - Start Prime X.400

Refer to Stage 8 of EXAMPLE I - Setting Configuration Defaults.

EXAMPLE VI - Define an Alternate Recipient

This example shows in stages, how to define an alternate recipient for undelivered mail. Each stage of the configuration is briefly described, below, indicating the data you are required to supply for that stage.

Stages in Defining an Alternate Recipient

1. Invoke CONFIG_X400 Command. (Refer to Stage 1 of EXAMPLE I - Setting Configuration Defaults.)
2. Define an alternate recipient.

   Field entries required for this stage are:

   Mail ID
   MTA Name

3. Verify, save and list your configuration. (Refer to Stages 5, 6, and 7 respectively, of EXAMPLE I - Setting Configuration Defaults.)
4. Start Prime X.400. (Refer to Stage 8 of EXAMPLE I - Setting Configuration Defaults.)

Figure 4-38 shows the hierarchy of screen forms that you navigate to define an alternate recipient.

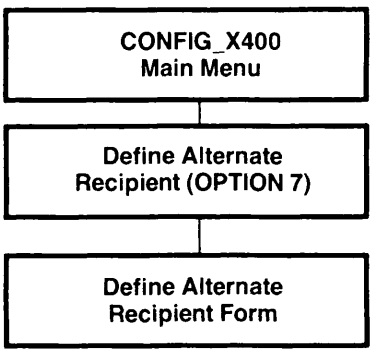

FIGURE 4-38. Hierarchy to Define Alternate Recipient

Stage 1 - Invoke CONFIG_X400 Command

Refer to Stage 1 of EXAMPLE I - Setting Configuration Defaults.

Stage 2 - Define Alternate Recipient

Select option 7, `Alternate Recipient`, from the CONFIG_X400 Main Menu (Figure 4-4.) You are presented with the Define Alternate Recipient form as shown in Figure 4-39. Sample entries are shown.

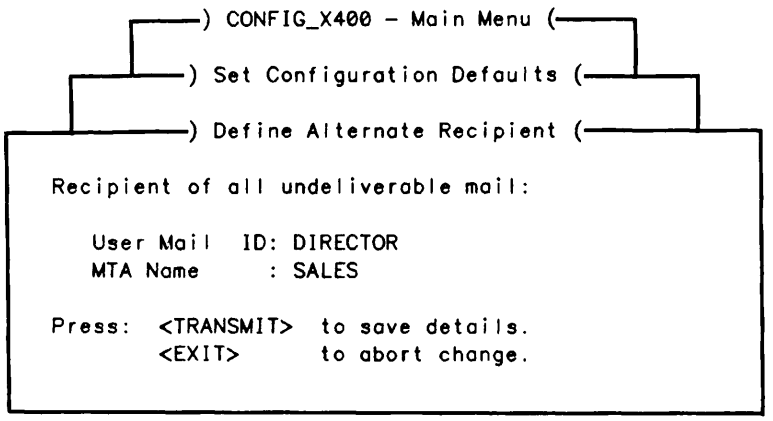

FIGURE 4-39. Define Alternate Recipient Form

In order to define an alternate recipient, you must enter an MTA name as the *minimum* requirement.

If *only* the MTA is specified, then the MTA must be a remote MTA.

If the Users Mail ID is specified, it must be an existing User Agent, either a *user* or *gateway.*

If both the MTA name and Users Mail ID are specified, then the MTA must be the one under which the Users Mail ID, resides.

(Refer to EXAMPLES III & IV - Configuring a Local/Remote MTA).

Stage 3 - Verify, Save and List Configuration

Refer to Stages 5, 6, and 7 respectively of EXAMPLE I - Setting Configuration Defaults.

Stage 4 - Start Prime X.400

Refer to Stage 8 of EXAMPLE I - Setting Configuration Defaults.

APPENDICES

A

INSTALLATION AND DIAGNOSTICS

Installation

To install Prime X.400 on the system,

- Mount the tape.
- Restore the tape using MAGRST.
- Run the program PRIME_X400>PRIME_X400.INSTALL.CPL.

The install program builds the PRIME_X400* runtime directory, updates the system's CMDNC0, and LIBRARIES*, HELP*, and LIB directories, and updates the system search rules.

If Rev. 2.0 (or later) of Priforma is not already installed on your system, then this must also be installed from the supplied tape.

The PRIME_X400* Directory

PRIME_X400* is the runtime product directory. It holds the server runfiles, security files, and miscellaneous data files, and contains subdirectories for the routing tables, journal log files, and other essential data files.

Files and subdirectories in PRIME_X400* are described as follows:

File	*Contents*
X400_[DATE].COMO	The como file for the Prime X.400 server. This contains startup information, subsystem error messages, trace, and diagnostic information.
X400_SERVER.RUN	The program that runs the Prime X.400 server.

X400_SERVER.CPL	The CPL file that controls server initialization.
X400_CACHE.RUN	The program that builds the runtime routing tables.
X400_SECURITY.RUN	The program that sets the ACL's for Prime X.400 logon IDs.
PRIME_X400.CONFIG	The Prime X.400 default configuration file.
X409.TXT	Contains parameters used in X.409 message parsing.
CST.INP	Contains parameters used by the ADMIN_X400 command interface.
SCT.INP	Contains parameters used by the Prime X.400 server.
ADMIN.ACAT	The access category that controls access to the ADMIN_X400 command.

Subdirectory	*Contents*
OBJECTS	Contains files OMRDTABL, which is the runtime routing table, and the data files for all messages being processed.
EVENQ	Contains backup information used to recover mail files after system crashes etc.
ODDQ	Contains backup information used to recover mail files after system crashes etc.
SECURITY	Defines ACLs for Prime X.400 logon IDs.
ADMIN	Contains the help file for the ADMIN_X400 command.
X400_CACHE	Contains local language help text and messages.
FORMS	Contains the data files for the CONFIG_X400 forms.

Error and Event Logging

Error Logging

Errors from the Prime X.400 subsystem software, and major events such as startup, are logged in the server COMO file.

Error messages are recorded in a standard format. For example:

```
08 Jun 88 17:43:06  Product ID  0001      Severity 000C  Error Code F006
                    User Data 1 0013  User Data 2 0000
```

Heading	*Description*
Product ID	An internal identifier that indicates which software module generated the error.
Severity	An indication of the importance of the event to Prime X.400 operation. This is a value 1 (least severe) through hexadecimal F (most severe).
Error Code	The error reference number.
User Data (1 and 2)	Additional error parameters for certain error codes. Check the error descriptions in Appendix B to determine the use, if any, for each error code.

For explanations of the error codes, and meanings of product and severity codes, see Appendix B.

B

PRIME X.400 ERROR MESSAGES

Error Messages

This appendix lists and explains the error messages produced by Prime X.400.

Error: 0B46
Internal buffer shortage. Recovery action is attempted by the server.

Error: 0B48
Internal buffer shortage. Serverity increased. User Data 1 contains the new severity level.

Error: 0BC1
Internal buffer pool corrupt. This error is fatal: the server terminates.

Error: 0BC3
Internal buffer pool corrupt. This error is fatal: the server terminates.

Error: 0BC4
Internal buffer shortage. Severity has reached maximum value (4). The server has been unable to recover from its buffer shortage. This error is fatal: the server terminates.

Error: 0BC5
Internal buffer shortage. The server has been unable to recover from its buffer shortage. This error is fatal: the server terminates.

Error: 0BC4
Internal buffer shortage. The server has been unable to recover from its buffer shortage. This error is fatal: the server terminates.

Error: 2100
Message received whilst initializing.

Error: 2101
Unrecognized message received.

Error: 2109
Received TPDU too big.

Error: 210B
Passenger message received while pending close response.

Error: 2132
Unknown called TSAP address on a TCON request.

Error: 2133
Unknown calling TSAP address on a TCON request.

Error: 2134
Too many bytes of user data on a primitive.

Error: 2135
Illegal attempt to select expedited data.

Error: 2136
Illegal attempt to select a nonzero QOS.

Error: 2137
Illegal attempt to request receipt confirmation.

Error: 2138
Bad originator on NDIS indication.

Error: 2139
Unknown called NSAP address on an NCON indication.

Error: 213A
Unknown calling NSAP address on an NCON indication.

Error: 213C
Remote NSAP address too long on an NCON indication.

Error: 213D
Unknown responding TSAP address on a TCON response.

Error: 2156
Received NCON confirmation but NC (Network Connection) not waiting for NCON confirmation.

Error: 2157
Bad TC (Transport Connection) state to receive an NCON confirmation.

Error: 2158
Received NCON confirmation but TC not in wait for NCON confirmation state.

Error: 2180
TPDU header length invalid (larger than 255 bytes).

Error: 2181
TPDU header length invalid (larger than the remaining space in the NSDU.)

Error: 2182
TPDU header length invalid (smaller than 3 bytes).

Error: 2183
Bad state for a CC TPDU.

Error: 2184
CC TPDU received from initiator, *or* duplicate CC received on a non class 4 connection.

Error: 2185
CC TPDU received from initiator, *or* duplicate CC received on a non class 4 connection.

Error: 2186
DR TPDU received in WFTRESP state.

Error: 2187
Invalid state to receive a DC TPDU.

Error: 2188
Invalid state to receive a DT TPDU.

Error: 2189
DT TPDU has too many elements for a TSDU.

Error: 218A
Invalid state to receive an AK TPDU.

Error: 218B
Arrival of an EA/ED TPDU when expedited data has not been selected.

Error: 218C
Invalid state to receive an ED TPDU.

Error: 218E
Invalid state to receive an EA TPDU.

Error: 218F
Arrival of an ER TPDU whilst awaiting a TCON response.

Error: 2194
Arrival of a TPDU for a lost TS user.

Error: 2195
RJ TPDU received.

Error: 2196
Arrival of an unrecognized TPDU.

Error: 2197
Bad destination reference on a TPDU.

Error: 2198
Illegal attempt to split a TC onto an NC.

Error: 219B
EOT badly set on an ED or DT TPDU.

Error: 219C
Checksum failed on received TPDU.

Error: 219D
TPDU header is longer than stated.

Error: 219E
TPDU contains an illegal or unrecognized parameter.

Error: 219F
TPDU size is larger than the negotiated maximum.

Error: 21A0
Length of user data is illegal.

Error: 21A1
Arrival of an illegal AK TPDU on a Class 0 connection.

Error: 21A2
Arrival of an AK TPDU that makes an illegal window change.

Error: 21A4
Header too short for the fixed part of a TPDU.

Error: 21A5
Invalid destination reference on a DC TPDU.

Error: 21A6
Arrival of an illegal DC TPDU on a Class 0 connection.

Error: 21A7
Invalid references on a DR TPDU.

Error: 21A8
Arrival of a TPDU that cannot be associated.

Error: 21A9
Bad attempt at class negotiation on a CC TPDU.

Error: 21AA
Bad option parameter on a CC TPDU.

Error: 21AB
Arrival of a bad duplicate CC.

Error: 21AD
Bad Value for the credit to send on a CC TPDU.

Error: 21AE
Bad parameter on a CC TPDU.

Error: 21AF
Arrival of an illegal duplicate CR.

Error: 21B0
Bad parameter on a CR TPDU.

Error: 21B1
Arrival of a CR with a bad source reference.

Error: 21B3
Arrival of a CR without a TSAP.

Error: 21B4
An attempted association between Network and Transport entities has failed.

Error: 21C0
Illegal LPI-STATE combination.

Error: 21C1
Connection affected by server buffer shortage.

Error: 21C2
Connection affected by lost network connection.

Error: 21C6
Internal queue corruption.

Error: 21D3
Internal queue corruption.

Error: 21D4
Internal queue corruption.

Error: 2200
The transport connection has been lost. Session recovery mode is entered.

Error: 2201
A user who is already logged on has tried to log on again. The logon attempt is rejected.

Error: 2202
An attempt has been made to logon by an unknown user. (The user is not specified in the configuration file). The logon attempt is rejected.

Error: 2203
Insufficient resources to service a logon request. The logon request is rejected. If this error persists, the server should be retstarted with a higher MAX_USERS value.

Error: 2204
A logon request has been received whilst initialization is still in progress. The request is rejected.

Error: 2205
A logon request has been received whilst termination is in progress. The request is rejected.

Error: 2207
A message received via the API has been rejected because it contains errors.

Error: 2208
Failed to secure a message from the API onto internal queues. The message is rejected.

Error: 220C
A passenger request has been received when it expects a close. The message is discarded. User Data 1 contains the Passenger message type.

Error: 2210
A syntax error was detected when parsing an MPDU. User Data 1 contains the Syntax Error code:

Invalid X409 type byte (1),

Invalid X409 length byte (2),

Indefinate length primitive (3),

Too many bytes at this level (4),

Mandatory item missing (6),

Unchosen Choice (7),

Choice chosen twice (8),

Unexpected type byte (9),

Repeated item in set (A),

Originator O/R name unrecognised (D),

Loop Detected for Delivery Report MPDU (E),

(List continues on next page)

User Data 1 contains the Syntax Error code: (Continued)

P1 contents too long (F),

P1 contents too short (10),

Syntax Error in P2 (11),

Missing descriptor for contents (13),

Missing start of sequence (14),

Read past end of descriptors (15).

Error: 2211

A semantic error was detected when parsing an MPDU. A delivery report MPDU is generated. User Data 1 contains the Semantic Error Code:

Error in content type (4),

Illegal presence of trace information (5),

Error in trace information (6),

Loop detected for user or probe MPDU (7).

Error: 2212

A message for an invalid recipient or a messages containing Encoded Information Types that the user does not support has been received. A non-delivery report is generated. User Data 2 contains the nondelivery reason and diagnostic codes for the recipient, coded as: 128 + 16*(Reason Code) + Diagnostic Code, in Hex.

Error: 2213

A message has been received for a user that does not support the body types contained in the message. A non-delivery report is generated.

Error: 2220

A bad concatenation of SPDUs has been received. An S-P-ABORT.ind and an ABORT SPDU is sent.
User Data 2 contains the SPDU identifier.

Error: 2229

Error detected in SPDU. An S-P-ABORT.ind and an ABORT SPDU is sent.
User Data 1 contains the format error (1), SPDU-id error (2).
User Data 2 contains the SPDU identifer.

Error: 222A

Protocol Error due to a received session primitive. An S-P-ABORT.ind, and an ABORT SPDU is sent.
User Data 1 contains the session state.
User Data 2 contains the Session primitive type.

Error: 222C

A session layer protocol error has been detected, for example, a primitive collision. Session recovery mode is entered.
User Data 1 contains the session state.
User Data 2 contains the SPDU identifer.

Error: 222D

A TSDU has arrived at Message Transfer Layer, whose length is greater than the negotiated maximum TSDU size. An S-P-ABORT.ind, and an ABORT SPDU is sent.
User Data 1 contains the TSDU length.
User Data 2 contains the negotiated maximum TSDU size.

Error: 222E

Error detected in session primitive. An S-P-ABORT.ind, and an ABORT SPDU is sent.
User Data 1 contains the Format error (1), SPDU-id error (2).
User Data 2 contains the primitive type.

Error: 222F

A T-Connect indication has been rejected because the remote TSAP was not recognised. The connection is rejected.

Error: 2231

An S-connect indication has been received that has no SS-User data. The indication is rejected.

Error: 2232

An S-connect indication for a new connection has been refused because there are no free RTS control blocks. The indication is rejected.

Error: 2233

An S-connect indication has been rejected because the the SS-user data is invalid. User Data 1 contains the current offset in SS-User data. The indication is rejected.

Error: 2234

An S-connect indication for a recovery has been refused because the RTS was unable to validate the session connection identifier. The indication is rejected.

Error: 2235

An exception report has been received for the current activity.

User Data 1 contains the action taken:

0 = discard current activity,

1 = interrupt current activity.

User Data 2 contains the reason code on exception report:

0 = non-specific error,

1 = receiving ability jeopardised,

3 = sequence error,

5 = local SS-user error,

6 = unrecoverable procedure error.

Error: 2236

Message Transfer Layer has detected a sequence error on the last received checkpoint. User Data 1 contains the action taken:

0 = discard current activity,

1 = interrupt current activity

Error: 2237

An error has been detected in an incoming message, at the RTS level. Parameter 1 indicates the type of message:

1 = P-CONNECT

2 = P-ACCEPT

3 = P-REFUSE The session will be aborted.

Error: 2240

The Remote MTA has rejected an attempt to open an association. If the reason code specifies that the attempt should be retried (eg. busy), it will be. Otherwise, the attempt is aborted.

User Data 1 contains the association control block index.

User Data 2 contains the reason code:

0 = busy,

1 = cannot recover,

2 = authentication failure,

3 = unacceptable dialogue mode,

4 = invalid SSAP.

Error: 2245

An ROPEN indication has been received that contains an error. A negative ROPEN response is sent.

User Data 1 contains the error code:

0 = busy,

1 = cannot recover,

2 = authentication failure,

3 = unacceptable dialogue mode,

4 = invalid SSAP.

Error: 2246
An ROPEN confirmation has been received whose RTS user data has failed the validation test. The association is closed.

Error: 2258
Insufficient server resources to generate a body file. A negative data confirm message is sent.

Error: 2259
An attempt to rename a body file has failed. A negative data confirm message is sent.

Error: 22A0
Error opening file. All operations on the affected file will be suspended.

Error: 22A1
Read failure. All operations on the affected file are suspended.

Error: 22A2
Error deleting file. All operations on the affected file are suspended.

Error: 22A3
Error closing file. All operations on the affected file are suspended.

Error: 22A4
Error opening file. All operations on the affected file are suspended.

Error: 22A5
Write failure. All operations on the affected file are suspended.

Error: 22A6
Error deleting file. All operations on the affected file are suspended.

Error: 22A7
Error closing file. All operations on the affected file are suspended.

Error: 22A8
Error in queue directory. If this error occurs during initialization the server terminates; otherwise all operations on the queue are inhibited.

Error: 22A9
Queue activity suspended after previous error.

Error: 22AA
Error in data read from queue or queue directory. All operations on the queue are suspended.

Error: 22BB
Failed to open the routing and directory file (PRIME_X400*>OBJECTS>OMRDTABL.CACHE). The server terminates.

Error: 22D0
The number of users exceeds the maximum suported The server terminates. Restart the server with a smaller MAX_USERS value.

User Data 1 contains the seleted number of users.

User Data 2 contains the maximum suported.

Error: 22D1
The number users exceeds the maximum suported The server terminates. Restart the server with a smaller MAX_USERS value.

User Data 1 contains the seleted number of users.

User Data 2 contains the maximum suported.

Error: 22D2
The number of MTAs exceeds the maximum supported. The server terminates.

User Data 1 contains the current number of MTAs.

User Data 2 contains the maximum suported.

Error: 22D3
The number of Associations exceeds the maximum supported. The server terminates.

User Data 1 contains the current number of associations.

User Data 2 contains the maximum supported.

Error: 22D4
The number of Associations exceeds the maximum supported. The server terminates.

User Data 1 contains the current number of associations.

User Data 2 contains the maximum suported.

Error: 22D5
The number of Remote Associations exceeds the maximum supported. The server terminates.

User Data 1 contains the current number of associations.

User Data 2 contains the maximum supported.

Error: 22D9

The number of MD control blocks in the exceeds the maximum supported. The server terminates. Decrease one or both of the number of MTAs and Users configured.

User Data 1 contains the current value.

User Data 2 contains the maximum supported.

Error: 22E0

Error while reading in the Routing and Directory table (PRIME_X400*>OBJECTS>OMRDTABL.CACHE). The server terminates.

Error: 22E3

The number of gateway users configured is greater than the number supported. The server terminates.

User Data 1 contains the current number of gateways.

User Data 2 contains the maximum supported.

Error: 22E4

The number of gateway users configured is greater than the number supported. The server terminates.

User Data 1 contains the current number of gateways.

User Data 2 contains the maximum supported.

Error: 22EB

A mismatch between the queue directories and the configuration has been detected. The server terminates. Check for corrupted/missing files.

User Data 1 contains the logical name for which the mismatch was found. (The logical name list can be found in PRIME_X400*>OBJECTS>LNF).

User Data 2 indicates the mismatch:

Previously unused logical name now assigned to Message Transfer Agent (MTA) (2),

Previously unused logical name now assigned to an User Agent (UA) (3),

Previously unused logical name now assigned to a gateway (GW) (4),

Logical name already in use but now assigned to an MTA (5),

Logical name already in use but now assigned to an UA (6),

Logical name already in use but now assigned to an GW (7),

Logical name was in use but is now unassigned (8).

Error: 22EC
A failure has occured when Message Transfer Layer attempted to rename the R&D table (PRIME_X400*>OBJECTS>OMRDTABL.CACHE) at the end of initialisation. The server terminates.

Error: 22EF
Insufficient resources to handle aborted associations. Server attempts to recover associations.

Error: 22F7
Insufficient resources to process ADMIN_X400 command.

Error: 22F8
Reference to unknown entity detected in a DISPLAY command issued via ADMIN_X400.

User Data 2 contains the error code:

Invalid_primary_entity (1),

Invalid_primary_parameter (2),

Invalid_secondary_entity (3).

Error: 22F9
Insufficient resources to send log message.

Error: 22FA
Failed to respond to ADMIN_X400 request due to an internal error.

Error: F006
Failed to register server with ISC. The server terminates. Is there a server already running?

Error: F009
Connection attempt from API or ADMIN_X400 whilst initialisation still in progress. The connection is rejected.

Error: F00B
Connection attempt from API or ADMIN_X400 whilst initialisation still in progress. The connection is rejected.

Error: F00C
Error when picking up a new connection request from API or ADMIN_X400. The request is ignored. User Data 1 contains the ISC error code.

Error: F00D
Error when picking up a session event. The connection may have been lost. User Data 1 contains the ISC error code.

Error: F00E
Error when accepting an ISC Session. The connection may have been lost. User Data 1 contains the ISC error code.

Error: F011
Insufficient free memory to accept a session connection from API or ADMIN_X400.

Error: F201
Failed to clear X.25 VC (X$CLR) User Data 1 contains the Primenet status code.
F202 call to XLCONN failed.
Error: F203
X.25 VC cleared by network or remote MTA.

Error: F204
X.25 VC cleared by local MTA.

Error: F205
Failed to setup X.25 connection.

Error: F206
X.25 reset received.

Error: F207
Incoming X.25 call cannot be accepted due to lack of resources.

Error: F208
X.25 packet received with Q-bit set or interrupt packet. Possibly caused by connecting to PAD/Remote Login Service. Either configuration problem or (prior to Revision 22) the remote MTA is not available.

Error: F209
Failed to accept X.25 call (XLACPT)

Error: F20A
NS-user violated protocol

Error: F20B
Failed to pick up call (XLGC$)

Error: F306
Error reading message from API.

Error: F307
Error sending message to API.

Error: F400
File system error detected.
User Data 1 contains the Primos error code.

User Data 2 indicates the operation being performed:

Open file for read (1),

Open file for write (2),

Open file for append (3),

Close file (4),

Delete file (5).

Error: F608
The configuration contains more subnetwork definitions than are supported.

Error: F609
The number of active users requested (via -MAX_USER parameters to ADMIN_X400) exceeds the maximum supportable.

User Data 1 contains the number of active local users requested.

User Data 2 contains the maximum supported.

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READER RESPONSE FORM

Prime X.400 Administrator's Guide
DOC11276-1LA

Your feedback will help us continue to improve the quality, accuracy, and organization of our publications.

1. How do you rate this document for overall usefulness?

   ☐ *excellent* ☐ *very good* ☐ *good* ☐ *fair* ☐ *poor*

2. What features of this manual did you find most useful?

   _____
   _____
   _____
   _____
   _____
   _____

3. What faults or errors in this manual gave you problems?

   _____
   _____
   _____
   _____
   _____
   _____

4. How does this manual compare to equivalent manuals produced by other computer companies?

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5. Which other companies' manuals have you read?

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