



***NTS Planning and  
Configuration Guide***

*Revision 21.0*

***DOC10159-1LA***

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# NTS Planning and Configuration Guide

*First Edition*

Andrew Shores

*Updated for Revision 22.0 by*

Andrew Shores

*This guide documents the software operation of the  
Prime Computer and its supporting systems and utilities as  
implemented at Master Disk Revision 22.0 (Rev. 22.0).*

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# About This Book

## Purpose

The *NTS Planning and Configuration Guide* explains how to install and configure Network Terminal Service (NTS) and the LAN300 Network Management Facility. Although this guide does explain how to set the NTS configuration file and system CONFIG file for WSI300 networks, you must refer to the *WSI300 User's Guide* for complete WSI300 installation instructions.

## Audience

This guide is intended for those responsible for installing and configuring NTS: Network and System Administrators.

## Organization

The *NTS Planning and Configuration Guide* contains five chapters and a glossary, which are summarized below.

### Chapter 1 — Planning an NTS Network

Introduces the hardware components of an NTS network and provides guidelines to help you plan your NTS network topology.

### Chapter 2 — Installing NTS

Provides procedures for installing NTS and the LAN300 Network Management Facility, lists the access rights required for network processes and explains how to protect the network-related directories. Also discusses how to set NTS-related CONFIG directives and explains how to modify PRIMOS.COMI.

### Chapter 3 — Preparing to Configure an NTS Network

Describes the configuration process, the NTS configuration file, and the elements of an NTS configuration. Also provides a checklist of questions that you should answer before using CONFIG\_NTS, the NTS configuration program.

#### Chapter 4 — Configuring an NTS Network

Explains how to use CONFIG\_NTS to create, modify, display, or print an NTS configuration file.

#### Chapter 5 — Sample NTS Configurations

Shows the CONFIG\_NTS dialog to create and edit two sample configurations, along with diagrams and explanatory notes.

#### LAN300 Glossary

Defines Prime network terminology. These terms are printed in boldface type the first time they are described in the text.

## Related Documentation

These documents provide related information:

- *NTS User's Guide* (DOC10117-2LA)
- *LTS300 Installation Guide* (DOC11034-1LA)
- *WSI300 User's Guide* (DOC10155-2LA)
- *PRIMENET Planning and Configuration Guide* (DOC7532-4LA)
- *Programmer's Guide to Prime Networks* (DOC10113-1LA and its Rev. 22.0 update, UPD10113-11A)
- *Operator's Guide to Prime Networks* (DOC10114-1LA and its Rev. 22.0 update, UPD10114-11A)
- *User's Guide to Prime Network Services* (DOC10115-1LA)
- *DSM User's Guide* (DOC10061-2LA)
- *ICS User's Guide* (DOC10094-1LA and its update, UPD10094-11A)
- *System Administrator's Guide, Volume I: System Configuration* (DOC10131-2LA)
- *System Administrator's Guide, Volume II: Communication Lines and Controllers* (DOC10132-2LA)
- *System Administrator's Guide, Volume III: System Access and Security* (DOC10133-2LA)
- *Operator's Guide to System Commands* (DOC9304-4LA)
- *PRIMOS User's Guide* (DOC4130-5LA)

The following chart shows where to find the information you need in the Prime networks document set. There is a column for each network product and a row for each functional activity. For example, to find information on monitoring and controlling PRIMENET™, refer to the *Operator's Guide to Prime Networks*.



	PRIMENET	NTS	WSI300
Configuration	<i>PRIMENET Planning and Configuration Guide</i>	<i>NTS Planning and Configuration Guide</i>	
Installation		<i>LTS300 Installation Guide</i>	<i>WSI300 User's Guide</i>
Monitoring and Control	<i>Operator's Guide to Prime Networks</i>		
Using the Software	<i>User's Guide to Prime Network Services</i>	<i>NTS User's Guide</i>	
Programming	<i>Programmer's Guide to Prime Networks</i>		

## Prime Documentation Conventions

The following conventions are used in command formats, statement formats, and in examples throughout this document. Examples illustrate the uses of these commands and statements in typical applications.

<i>Convention</i>	<i>Explanation</i>	<i>Example</i>
UPPERCASE	In command formats, words in uppercase indicate the names of commands, options, statements, and keywords. Enter them in either uppercase or lowercase.	CONFIG_NTS
lowercase	In command formats, words in lowercase indicate variables for which you must substitute a suitable value.	CONFIG_NTS [config-file]
Abbreviations in format statements	If an uppercase word in a command format has an abbreviation, the abbreviation is underscored.	CONFIG_NTS <u>HELP</u>
Brackets [ ]	Brackets enclose a list of one or more optional items. Choose none, one, or more of these items.	LD [-BRIEF] [-SIZE]
Braces { }	Braces enclose a list of items. Choose one and only one of these items.	CLOSE {filename} ALL }

<i>Convention</i>	<i>Explanation</i>	<i>Example</i>
Parentheses ( )	In command or statement formats, you must enter parentheses exactly as shown.	<b>DIM array (row, col)</b>
Hyphen -	Wherever a hyphen appears as the first character of an option, it is a required part of that option.	CONFIG_NTS -HELP
<b><i>Bold italics</i></b> in examples	In examples, user input is in bold italics but system prompts and output are not.	OK, <b><i>RESUME MY_PROG</i></b> This is the output of MY_PROG.CPL OK,
Subscript	A subscript after a number indicates that the number is not in base 10. For example, the subscript 8 is used for octal numbers.	200 <sub>8</sub>

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# 1

## Planning an NTS Network

This chapter describes LAN300 hardware configuration and provides general guidelines for setting up your equipment. This information can help you plan the topology (physical layout) of your NTS network.

### LAN300 Overview

The LAN300 network used for NTS is based on IEEE 802.3, an industry standard for local area networks. Four Prime® network products run on the LAN300: PRIMENET™, Network Terminal Service (NTS), Work Station Interconnect 300 (WSI300), and the LAN300 Network Management Facility. These products can run concurrently on the same LAN300. The LAN300 Network Management Facility is required to provide support functions for the other three products.

**PRIMENET:** The LAN300 extends the standard PRIMENET services over the IEEE 802.3 transmission medium. All PRIMENET services run unchanged on LAN300s, including Remote Login, NETLINK, NPX, FTS, and Interprocess Communications Facility (IPCF) except for minor differences in IPCF subroutines to accommodate for differences in the physical transmission medium. (These differences are explained in the *Programmer's Guide to Prime Networks*.) As many as 256 PRIMENET nodes can be attached to each LAN300.

**NTS:** NTS is a separate network product that allows large numbers of asynchronous terminals and devices to communicate with any host on the network; it does not support host-to-host communications. NTS terminals are attached to LAN Terminal Server 300s (LTS300s) instead of hosts. As many as 1024 NTS hosts and LTS300s can be attached to a LAN300 network.

**WSI300:** WSI300 allows Prime hosts to communicate with Prime workstations and non-Prime systems using Transmission Control Protocol/Internet Protocol (TCP/IP). The TCP/IP FTP service transfers files between systems. TELNET, another TCP/IP service, allows users on Prime workstations and non-Prime equipment to log in to a 50 Series™ host.

**LAN300 Network Management Facility:** The LAN300 Network Management Facility provides service functions to the LAN300, such as downline loads of software to network devices, event and error logging, statistics gathering, and status commands. LAN300 Network Management must be running to support the other three products.

The LAN300 network has these characteristics:

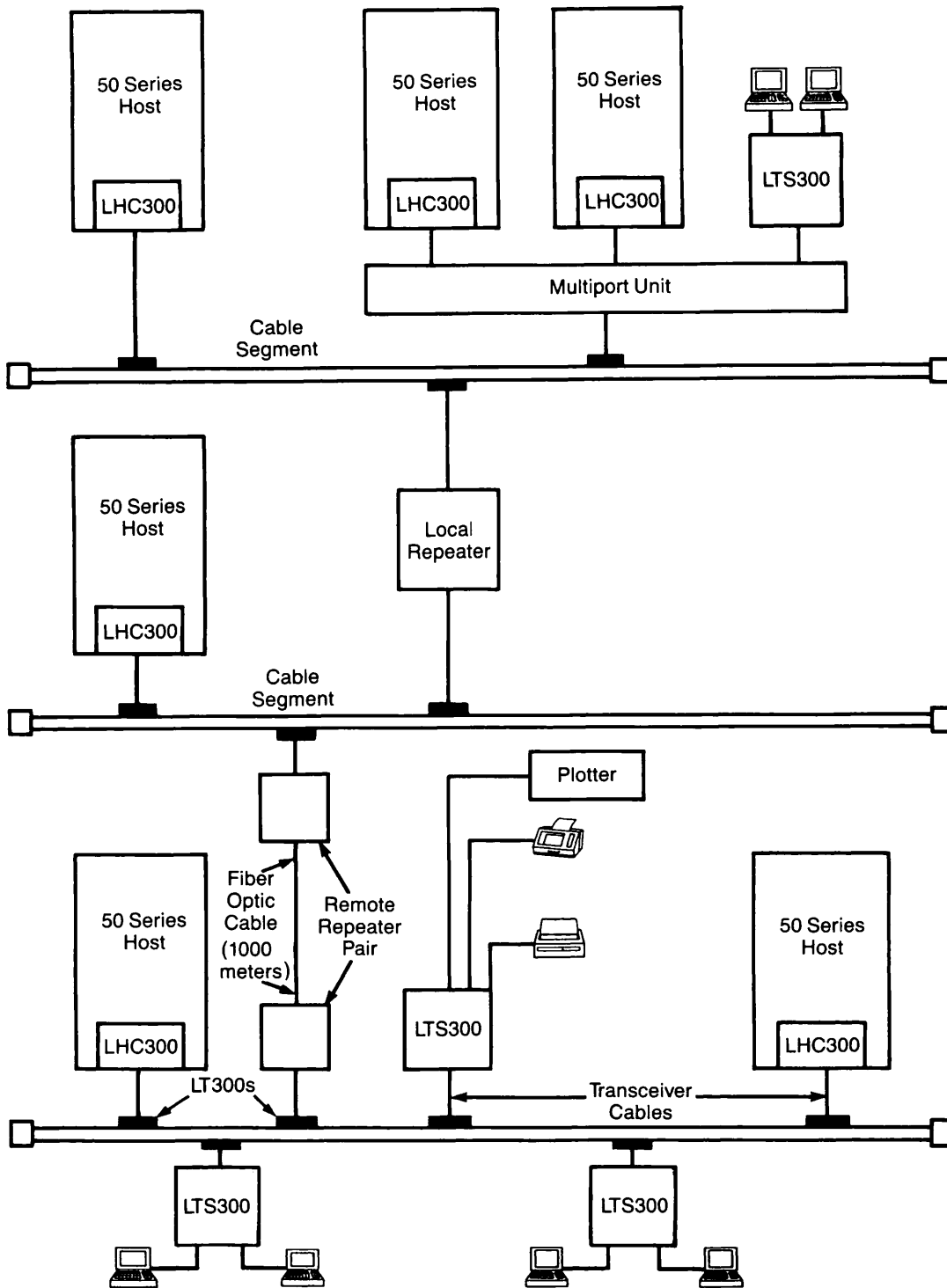
Access Method:	Carrier Sense Multiple Access with Collision Detection (CSMA/CD)
Data Rate:	10 megabits per second
Signaling:	Baseband

## LAN300 Hardware

Before you plan your NTS network and create its software configuration file, you should familiarize yourself with the hardware components of the network. In many cases, the software configuration depends on the way that the physical equipment is set up. LAN300 networks can contain the following hardware components:

- Cable Segments
- Local Repeaters
- Remote Repeaters
- LAN Transceiver 300s (LT300s)
- Transceiver Cables
- LAN Host Controller 300s (LHC300s)
- LAN Terminal Server 300s (LTS300s)
- LAN Multiport Transceiver 300s (LMT300s)

Figure 1-1 illustrates a LAN300 network with these hardware components, which are described in the following sections.



**FIGURE 1-1**  
**LAN300 Network**

## Cable Segment

Most LAN300s consist of one or more 500-meter (maximum) **segments** of standard IEEE 802.3 50-ohm coaxial cable. (LAN Multiport Transceiver 300s, described below, provide a cableless LAN300.) There are two materials used for cable segments: yellow-colored PVC, which is acceptable for most installations, and orange-colored Teflon, which is heat and fire resistant and suitable for installation in air plenums. The ends of the cable segments are capped by 50-ohm resistors.

Each segment supports as many as 100 Medium Access Units (MAUs), spaced at least 2.5 meters apart. MAUs are small mechanisms that pierce the cable segment, creating an attachment point for a transceiver or a repeater. A **transceiver** is a hardware component that provides a connection for a LAN Host Controller 300 (LHC300) or a LAN Terminal Server 300 (LTS300), to which you can connect a Prime host or cluster of terminals, respectively. Such a collection of hardware is referred to as a **node** or **station**. Each LAN300 can have a maximum of 1024 nodes. Individual cable segments can be linked to form a larger network by local or remote repeaters.

## Local Repeater

A **local repeater** is a single microprocessor-based component that links two 500-meter (maximum) coaxial cable segments, making a LAN300 as long as 1000 meters. Local repeaters boost the signal, allowing longer LAN300s.

Repeaters can be attached to any MAU position on the cable segment. Some local repeaters are attached to the MAU by a transceiver cable, whereas others have the MAU integrated into the unit. In either case, the MAU counts toward the maximum of 100 on the segment. There can be no more than two local repeaters between any two nodes on the network. For more information on LAN300 topology guidelines, see NTS Network Topology, later in this chapter. For a list of Prime-approved local repeaters, contact your Customer Support Center.

## Remote Repeater

A **remote repeater**, also called a **fiber optic repeater**, consists of two microprocessor-based components joined by a fiber optic cable that can be as long as 1000 meters. This fiber optic cable is also called a **link segment**; there can be no stations attached to it. Each component of the remote repeater is also connected to one of the coaxial cable segments in the LAN300.

Like local repeaters, remote repeaters can be connected to any MAU position on the cable segment, either directly or by a transceiver cable. They also count toward the maximum of 100 MAUs on a cable segment. There can be a maximum of two remote repeaters between any two nodes on the network. The maximum distance between any two nodes on the network is 3500 meters (not including transceiver cables), which is achieved by combining two remote repeaters and three coaxial cable segments in the path between the nodes. For a list of Prime-approved remote repeaters, contact your Customer Support Center.

## LAN Transceiver 300 (LT300)

A LAN Transceiver 300 (LT300) is a hardware component that provides network access for an LHC300 or an LTS300 (see Figure 1-2). The LT300 is attached to the cable segment by nonintrusive medium access unit (MAU), also known as a tap. The MAU used by Prime is called nonintrusive because it has a piercing pin mechanism that merely pierces the cable segment rather than separating it. The LT300 is linked to the LHC300 or LTS300 by a transceiver cable, described in the following section.

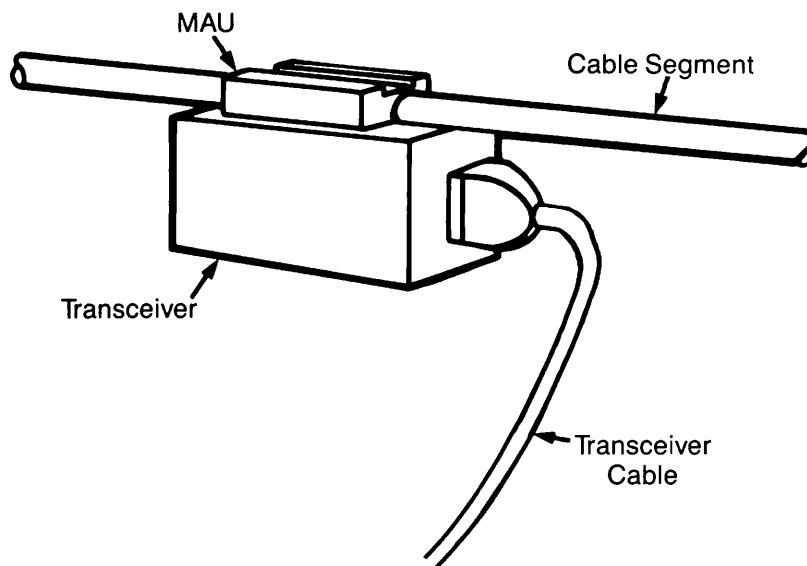


FIGURE 1-2  
LAN Transceiver 300 (LT300)

### Transceiver Cable

A transceiver cable connects the LT300 transceiver to an LHC300 or LTS300. Transceiver cables are also referred to as **drop cables** because they are typically dropped from the ceiling. They are officially called **Access Unit Interface (AUI) cables**. Prime offers transceiver cables in both standard PVC and heat-resistant Teflon, in straight and right angle shapes, and in lengths ranging from 5 through 40 meters. Contact your Prime Customer Support Center for details.

## LAN Host Controller 300 (LHC300)

A LAN Host Controller 300 is a controller board that plugs into the backplane of a Prime 50 Series computer. It is connected by a transceiver cable to a LAN Transceiver 300 (LT300) or a LAN Multiport Transceiver 300 (LMT300). An LHC300 can be attached to only one LAN300 at a time.

Each Prime host may have a maximum of six LHC300s, attached to the same or different LAN300s. Thus, a Prime host can be connected to as many as six different LAN300s. An LHC300 can support PRIMENET, NTS, both PRIMENET and NTS concurrently, or WSI300. A maximum of two LHC300s in a host can be running PRIMENET, and a maximum of four can be running NTS *or* WSI300. A maximum of four LHC300s in a host can be running NTS, on the same or different LAN300s. As many as two LHC300s can be running WSI300, on the same or different LAN300s. However, LHC300s running PRIMENET must be connected to different LAN300s.

For NTS, each LHC300 supports 128 concurrent terminal connections when only NTS is running, or 32 concurrent terminal connections when NTS and PRIMENET are running concurrently. When multiple LHC300s in a host are attached to the same LAN300, NTS automatically performs **load balancing** on incoming calls to the host and on outgoing calls to the LTS300. (Outgoing calls to the LTS300 are to NTS assigned lines only.) This improves performance by dividing network terminal connections among the LHC300s in the host.

An important part of NTS software configuration is assigning logical device numbers to the LHC300s in each host and indicating the LAN300 to which they are attached. The LHC300 logical device numbers are used as arguments for commands such as LIST\_LHC\_STATUS, which monitors the status of the LHC300.

LAN300 Network Management provides various services for the LHC300:

- Downline loading of software
- Upline dumping of software
- Event and error reporting
- Polling and recovery to detect and resolve LHC300 failures

Although all of the LAN300 Network Management functions are performed automatically, you can also manually load LHC300 software with the COMM\_CONTROLLER command. Unlike ICS controllers, LHC300s can be loaded with the COMM\_CONTROLLER command at any time, independent of cold start.

## LAN Terminal Server 300 (LTS300)

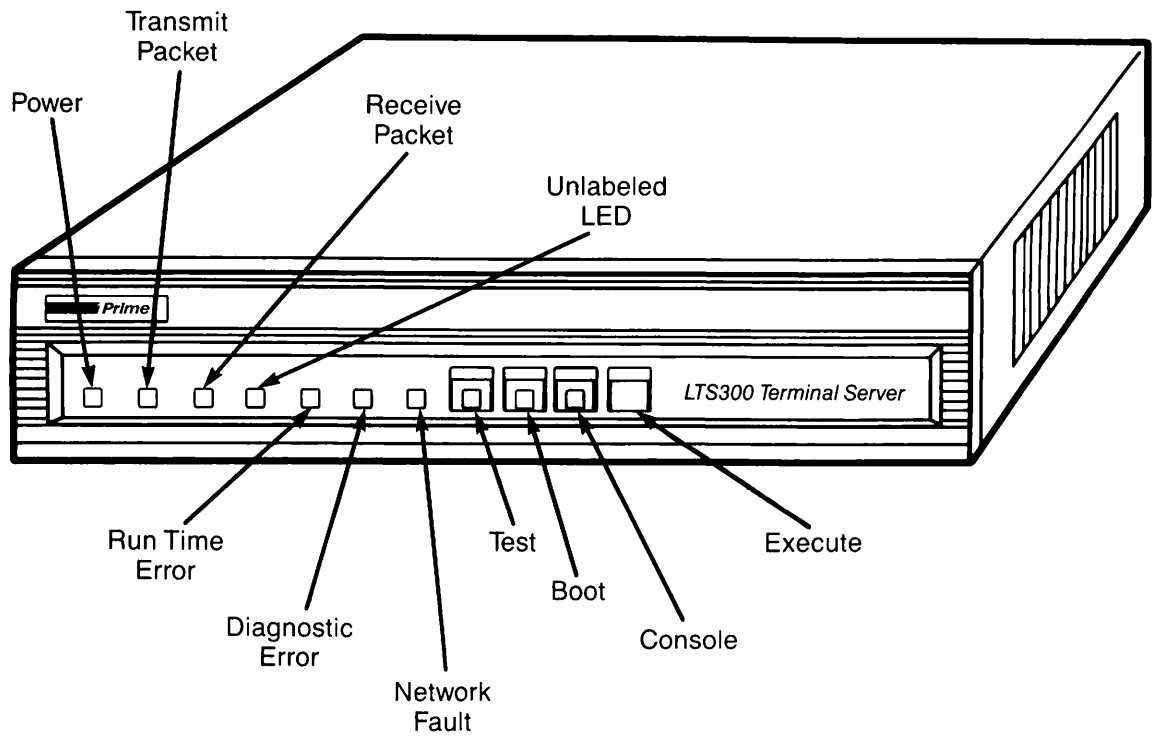
A LAN Terminal Server 300 provides network access for eight asynchronous terminals, serial printers, or other asynchronous devices (see Figure 1-3 and 1-4). These devices must be directly connected; the LTS300 currently does not provide modem support. The LTS300 is connected to a transceiver or a multiport transceiver by a transceiver cable. By issuing LTS300 commands, NTS terminal users can establish connections to host computers on the LAN300. Communication between LTS300s is currently not supported.



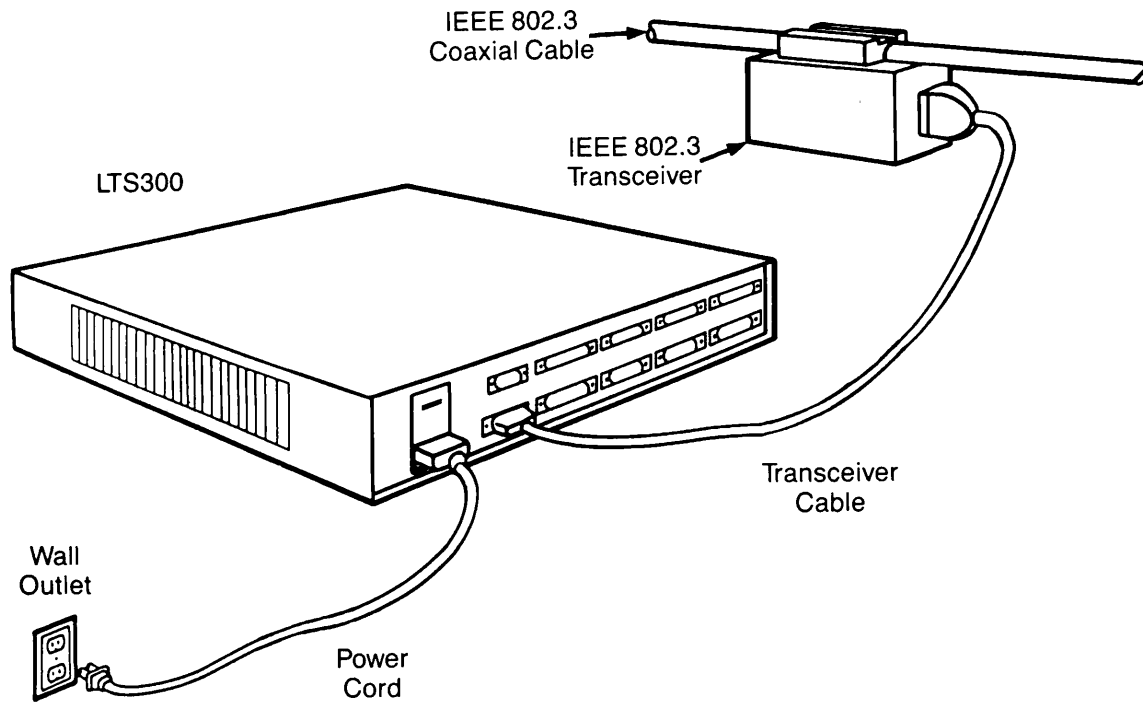
Each LTS300 is assigned an address during manufacture, which is printed on a tag attached to the LTS300. Your task during configuration is to associate this address with a logical name. The LTS300 logical names are used as arguments in commands such as LIST\_LTS\_STATUS, NTS\_ASSOCIATE, NTS\_UNASSOCIATE, and NTS\_LIST\_ASSOCIATE.

LAN300 Network Management provides the following services for LTS300s and LTS300 users:

- **LTS300 downline load service** allows network hosts to downline load LTS300 operating software. The LTS300 multicasts a downline load request upon power up, and the host configured to perform the function complies as soon as the LTS300 has passed its power up diagnostic tests. One host can concurrently downline load multiple LTS300s, or even every LTS300 in the network. Downline loading is necessary because LTS300s have limited permanent storage capabilities.
- **LTS300 upline dump hosts** allow LTS300s to send upline dumps of their operating software to NTS hosts. These dumps are used to analyze software failures.
- **LTS300 event logging service** allows LTS300s to log event and error messages to network hosts. This is required because LTS300s do not run Distributed Systems Management (DSM).
- **Host location service** allows LTS300 users to specify host names rather than addresses in connection requests.
- **Host listing service** allows LTS300 users to display a list of the available hosts on the network; that is, the hosts that are both operational and running NTS.



**FIGURE 1-3**  
**LTS300 Front View**



**FIGURE 1-4**  
**LTS300 Rear View**

It is possible to cascade as many as four LTS300s off of each other. A cascaded LTS300 is one that is cabled to the back of another LTS300 with a cascade or interconnection cable, rather than to a transceiver. Thus, a series of four cascaded LTS300s can share the same transceiver. Cascaded LTS300s are typically stacked on top of each other, as shown in Figure 1-5.

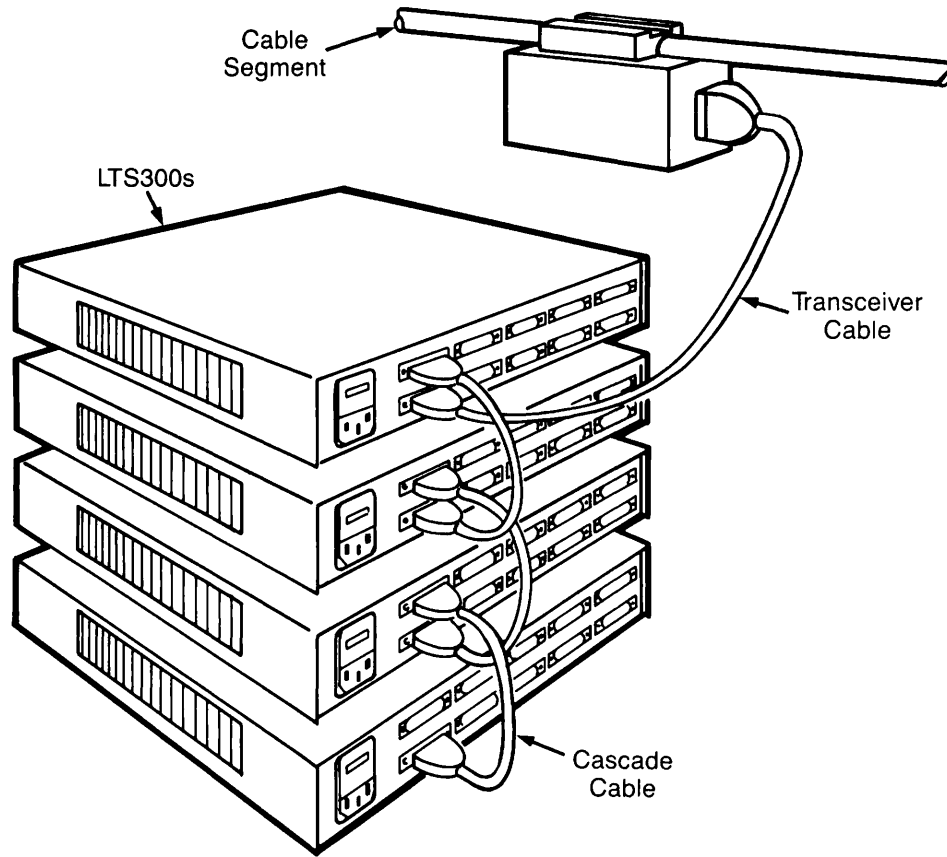


FIGURE 1-5  
Cascaded LTS300s

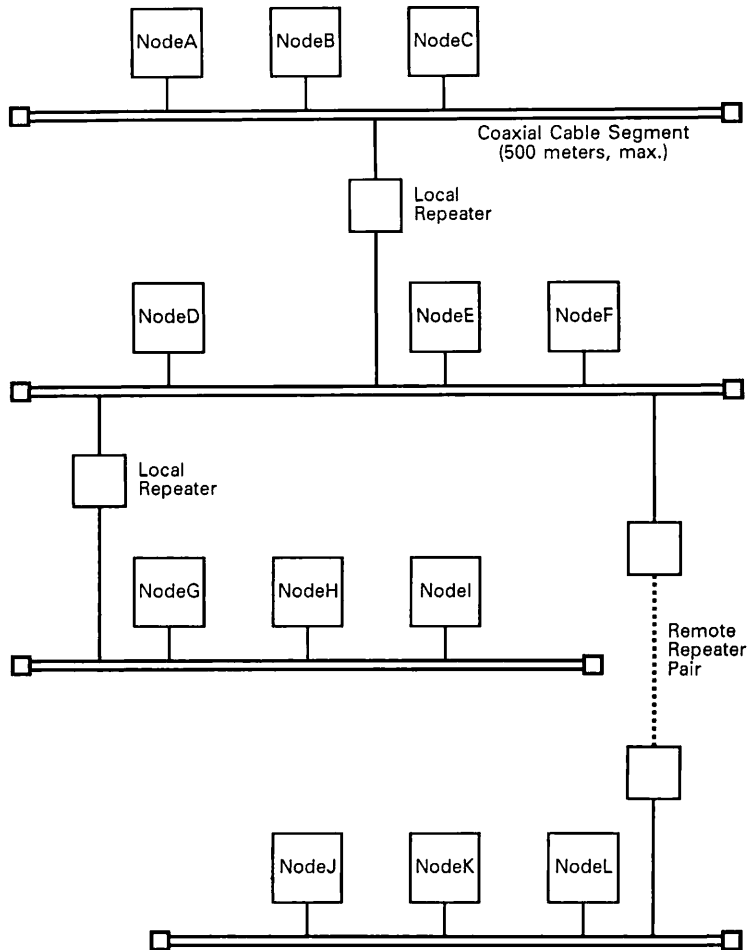
### LAN Multiport Transceiver 300 (LMT300)

A LAN Multiport Transceiver 300 (LMT300) provides network access for eight LHC300s or LTS300s. These devices are attached with transceiver cables. Since LMT300s can be cascaded two deep, as many as 64 nodes can be connected to the cable segment via the same MAU (64 LTS300s, cascaded four deep on each of the 16 LMT300 ports). This saves hardware costs when a large number of nodes are clustered in the same location.

LMT300s also serve another purpose: they allow hosts and LTS300s to be connected into a network that does not contain a cable segment at all. Such a network is a **cableless LAN300**; its maximum size is also 64 LTS300s, as described above. LAN Multiport Transceiver 300s are also referred to as **fanout units**.

## NTS Network Topology

Observe these general guidelines when deciding on the topology (physical layout) of your NTS network. Figure 1-6 is a sample NTS network topology that illustrates many of these guidelines.



**FIGURE 1-6**  
Sample NTS Network Topology

### General Guidelines

Observe these general guidelines when planning the topology of your NTS network:

- A single local repeater provides a maximum node separation of 1000 meters because it connects two 500-meter (maximum) segments. An example is the separation of NodeA and NodeF in Figure 1-6.
- A remote repeater allows for a maximum of 2000 meters between two nodes, as illustrated by NodeD and NodeJ in Figure 1-6. This is because a remote repeater consists of two boxes separated by a 1000-meter (maximum) fiber optic cable, with each box also attached to a 500-meter (maximum) cable segment.

- There can be a maximum of two repeaters of any type between any two nodes in the network. The maximum distance between nodes in a network, 3500 meters, is achieved by combining two remote repeaters and three cable segments.
- The maximum length of a coaxial cable segment is 500 meters. It can contain as many as 100 MAUs, spaced at least 2.5 meters apart.
- A LAN300 can contain as many as 1024 nodes, but a maximum of 256 of them can be running PRIMENET.

## Host-related Guidelines

Observe these guidelines when planning the NTS configuration for each Prime host on your NTS networks. A Prime host is a 50 Series computer connected to a LAN by a LAN Host Controller 300 (LHC300).

- A Prime host can be connected to a maximum of seven local area networks. There are also limits for each type of network: it can be connected to as many as two LAN300s running PRIMENET, four LAN300s running NTS, two LAN300s running WSI300, and only one RINGNET™ network. (The combined maximum number of NTS and WSI300 networks is four.) Of course, the number of networks a host can support depends on its CPU size and the number of board slots available in its backplane. (In the maximum configuration of seven local area networks, there would be a separate controller board for each network.)
- A maximum of seven network controller boards can be inserted into the backplane of a Prime host. This can include one PRIMENET Node Controller (PNC or PNC II) for RINGNET and as many as six LHC300s. A maximum of two of these LHC300s can run PRIMENET, as many as four can run NTS, and as many as two can run WSI300.
- Although you can run NTS and PRIMENET concurrently on an LHC300, this limits the number of NTS connections to 32. In addition, both networks count toward the maximum number of networks for the host. For example, a host with two LHC300s running NTS and PRIMENET concurrently could have at most two more LHC300s running only NTS and one PNC for RINGNET.
- WSI300 requires a dedicated LHC300; it cannot be run concurrently on an LHC300 with any other product. There can be a maximum of two LHC300s in a host running WSI300; they can be connected to the same or different LAN300s.
- As many as four LHC300s running NTS can be connected to the same LAN300 (or different LAN300s), but each LHC300 in the host running PRIMENET must be connected to a different LAN300.

## LTS300 and LMT300 Cascading Guidelines

The following guidelines concern cascading LAN Terminal Server 300s (LTS300s) and LAN Multiport Transceiver 300s (LMT300s). These units are cascaded when they are cabled to the back of each other rather than directly to a MAU.

- Up to four LTS300s can be cascaded from a single MAU, but all of the LTS300s must be powered up.
- LMT300s can be cascaded two deep.

## Transceiver Cable Guidelines

These guidelines apply to the transceiver cables (also called drop cables and AUI cables) in your network.

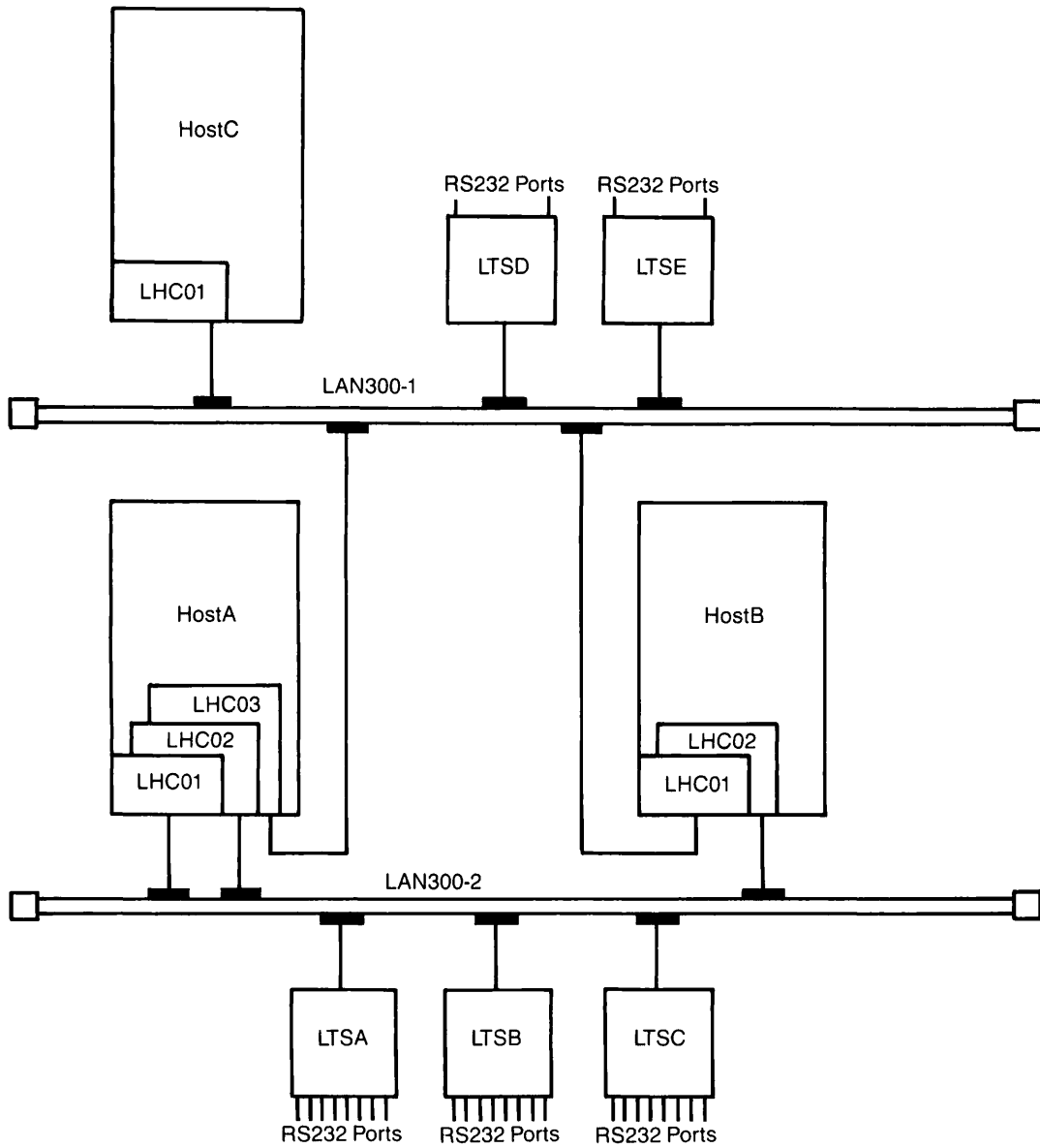
- The maximum length of a transceiver cable is 50 meters.
- When LTS300s are cascaded, the transceiver cable length is limited to 30 meters.
- There is a 44-meter cable budget for an LMT300. This includes the cable from the network transceiver to the LMT300 and the cable from the LMT300 to the LHC300 or LTS300.

## Multiple LHC300s Connected to a LAN300

For NTS, a host can be connected by more than one LHC300 to a LAN300. Multiple LHC300s connected to a LAN300 can improve network performance in heavy usage situations because the LHC300 is the primary bottleneck preventing very large numbers of terminal connections. (Each LHC300 can handle 128 concurrent terminal connections when only NTS is running, or 32 concurrent terminal connections when NTS and PRIMENET are running concurrently on the LHC300.) NTS automatically balances the terminal connection load between the LHC300s on a given LAN300. Figures 1-7 and 1-8 illustrate hosts with multiple LHC300s.

## Multiple LAN300s

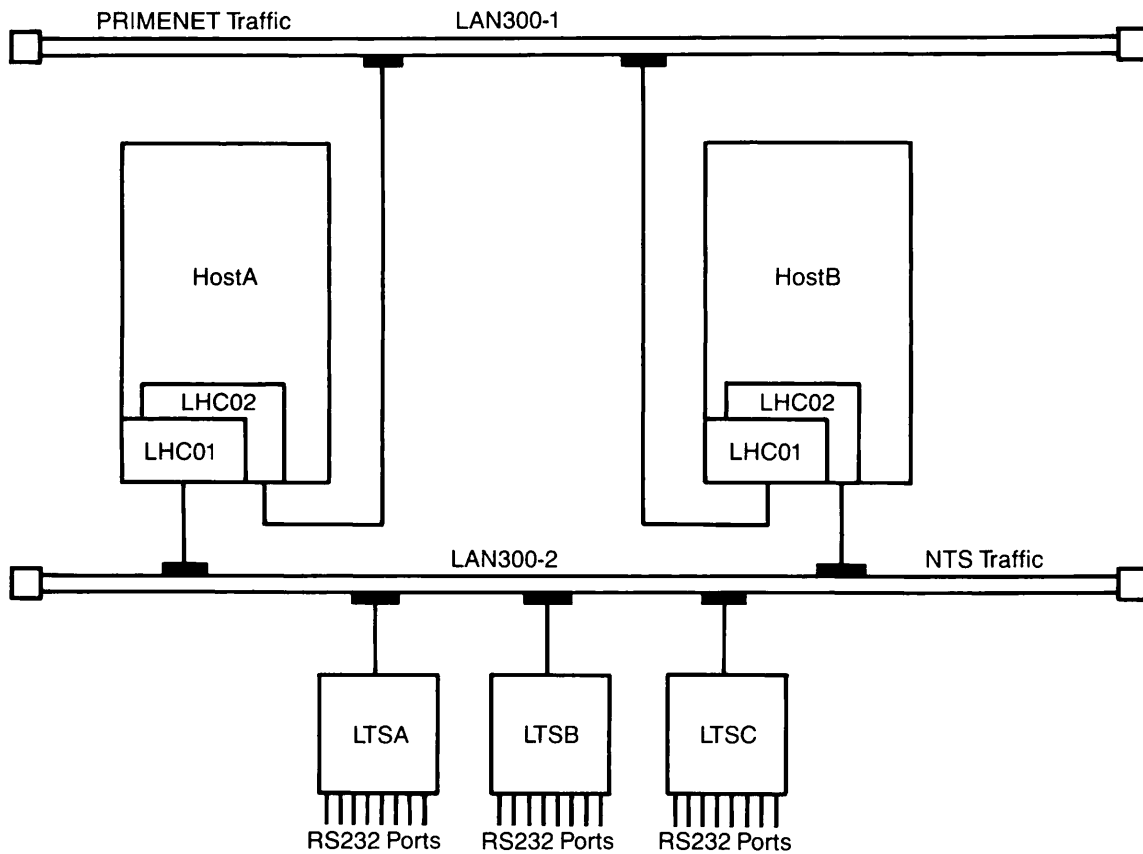
There are several reasons why you might want to divide your machine population into multiple NTS networks. One reason might be to improve network performance by dividing one large overused NTS network into smaller networks of machines that always communicate with each other. Another reason is to improve security. You could restrict access to sensitive machines by placing them on a separate LAN300. Figure 1-7 shows a configuration that contains multiple LAN300 networks for security reasons. Because HostC is a sensitive machine, it is placed on LAN300-1, where only users on LTSD and LTSE can reach it. HostA and HostB are connected to both LAN300-1 and LAN300-2; they can be reached by any of the LTS300s.



**FIGURE 1-7**  
Multiple LAN300s for Security

If you plan to use both PRIMENET and NTS, you could run PRIMENET on one LAN300 and NTS on the other. This would result in better network performance than if you ran both products concurrently on the same LAN300. One reason for this improved performance is that an LHC300 running only NTS supports 128 NTS connections, whereas an LHC300 running both NTS and PRIMENET supports only 32 NTS connections. Figure 1-8 shows a configuration where PRIMENET traffic is isolated on LAN300-1, whereas LAN300-2 is dedicated to NTS. If PRIMENET traffic is heavy, NTS users are much less likely to see pauses and delays with this configuration. This example is meant for illustration only; separate networks would be desirable only for much larger machine populations.





**FIGURE 1-8**  
**Multiple LAN300s to Separate Network Traffic**

NTS currently does not offer internetworking between LAN300s. That is, terminal users connected to an LTS300 can connect only to hosts on their directly connected LAN300. A way around this restriction is to connect to a host on the local LAN300, and then use PRIMENET Remote Login on that host to reach a machine that is not directly connected. The target computer could be on another LAN300, a RINGNET, a synchronous line, or a Packet Switching Data Network (PSDN).

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## 2 Installing NTS

Installing NTS involves the following actions, which correspond to the sections in this chapter:

- Installing LAN300 hardware
- Installing NTS software
- Setting NTS-related ACLs
- Setting NTS-related CONFIG directives
- Modifying PRIMOS.COMI
- Configuring DSM for LAN300 Network Management

When you have performed these tasks, the final steps are to create the NTS configuration file as described in Chapters 3, 4, and 5, and then cold start the system.

### Installing LAN300 Hardware

The first step in installing NTS is to lay out the cable segments if they are not already in place. Then, one or more LHC300 controller boards must be installed in the backplane of each NTS host. Make arrangements with your Prime Customer Support Center to have these tasks performed.

Once the cabling is in place, you must install the LTS300 terminal servers, as described in the *LTS300 Installation Guide*.

### Installing NTS Software

To install NTS software, follow this procedure:

1. Insert the NTS installation tape in the drive.
2. Attach to the Master File Directory (MFD).
3. Use the MAGRST command to copy the NTS directory to your system. For information on MAGRST, see the *Operator's Guide to System Commands*. Figure 2-1 illustrates the NTS installation directory.

- Use the RESUME command to run NTS.INSTALL.CPL. This CPL file copies the appropriate files from the NTS subdirectories to system directories. The last line of NTS.INSTALL.CPL invokes NETWORK\_MGT.INSTALL.CPL, which installs the LAN300 Network Management Facility if it has not already been installed during PRIMENET installation.

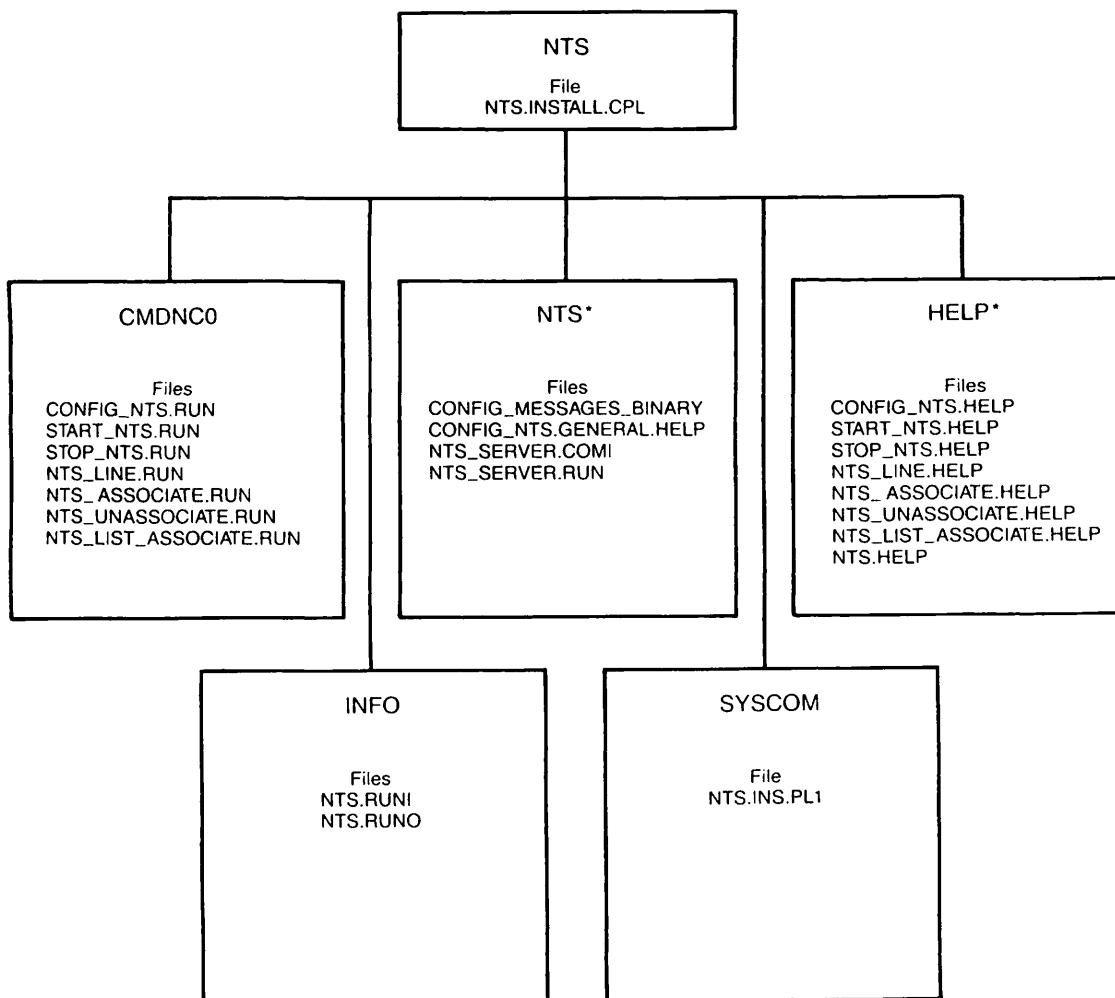


Figure 2-1  
NTS Installation Directory

## NTS Installation Directory

The NTS installation directory contains NTS.INSTALL.CPL, which installs the NTS software in the appropriate system directories, and five subdirectories: CMDNC0, INFO, NTS\*, SYSCOM, and HELP\*. (The LHC300 and LTS300 downline load files are not part of this installation procedure. Instead, they are included in DOWN\_LINE\_LOAD\*, a system directory on the master disk.)

**CMDNC0:** CMDNC0 contains the PRIMOS® external commands for NTS, which are copied to the system CMDNC0 directory by NTS.INSTALL.CPL. It contains these commands:

- NTS\_ASSOCIATE
- NTS\_UNASSOCIATE
- NTS\_LIST\_ASSOCIATE
- NTS\_LINE
- START\_NTS
- STOP\_NTS
- CONFIG\_NTS

**INFO:** INFO contains the files NTS.RUNI and NTS.RUNO, which document the NTS functionality and modifications since the last release. We recommend that you read this information to keep abreast of changes in NTS.

**NTS\*:** When installation is complete, NTS\* is the main directory for NTS. It serves as the Initial Attach Point (IAP) for NTS\_SERVER, the NTS connection manager server, and usually contains the NTS configuration file. NTS\* has these files:

**CONFIG\_MESSAGES\_BINARY**

The text used by CONFIG\_NTS, the NTS configuration program.

**CONFIG\_NTS.GENERAL.HELP**

A detailed help file available within CONFIG\_NTS, the NTS configuration program. This help file is not available from the PRIMOS command line.

**NTS\_SERVER.COMI**

The code that spawns NTS\_SERVER, the NTS connection manager server.

**NTS\_SERVER.RUN**

The program executed by NTS\_SERVER.

**SYSCOM:** SYSCOM contains NTS.INS.PL1, a file of constant declarations to be included in PL1 programs that call the NT\$LTS subroutine. NT\$LTS obtains the LAN media type, MAC address, LTS name, and LTS port number of an NTS connection on a PRIMOS line. NTS.INS.PL1 is copied into the system SYSCOM directory during the NTS installation procedure.

**HELP\*:** HELP\* contains the help files for the NTS-related PRIMOS external commands. These commands are listed in the section entitled CMDNCO, earlier in this chapter. NTS.INSTALL.CPL copies these help files into the system HELP\* directory during the NTS installation procedure.

## Setting NTS-related ACLs

After installing NTS, the next steps are to set the ACLs on NTS\* and to create an ACL group called .NETWORK\_MGT\$. These steps are described in the sections that follow. For more information on EDIT\_PROFILE and PRIMOS security in general, see the *System Administrator's Guide, Volume III: System Access and Security*.

### Setting ACLs on NTS\* and the NTS Configuration File

Assign the System Administrator ALL access right to NTS\* and the directory that contains or will contain the NTS configuration file. By default, the pathname of the NTS configuration file is NTS\*>NTS.CONFIG. Also, ensure that SYSTEM has LUR access rights to the directory containing the NTS configuration file. No other users should have access to NTS\* or the NTS configuration file.

### Creating the .NETWORK\_MGT\$ ACL Group

Use EDIT\_PROFILE to create an ACL group called .NETWORK\_MGT\$ and include the operators and administrators who are responsible for configuring and monitoring the LAN300 network. Members of .NETWORK\_MGT\$ share these privileges with User 1:

- They are allowed to use the LAN300 network management commands: LIST\_LHC\_STATUS, LIST\_LTS\_STATUS, and LOOPBACK.
- They can make LTS300 configuration changes take effect dynamically (automatically and immediately) when they save an NTS configuration file on disk. (Nonmembers of .NETWORK\_MGT\$ must stop NTS with STOP\_NTS, and then issue START\_NTS using the pathname of the altered configuration file.) For more information on dynamic configuration, see the section entitled Making Configuration Changes Take Effect in Chapter 3, Preparing to Configure an NTS Network.

## Setting NTS-related CONFIG Directives

Each NTS host must have certain NTS-related configuration directives in its CONFIG file. Be sure that the necessary directives, which are listed below and described in this section, are included on each system that you administer.

NTS directives:

- NTSUSR
- NTSASL
- NTSBUF
- NTSABF
- LHC

Other directives with NTS meanings:

- AMLCLK
- ASYNC JUMPER
- AMLTIM
- DISLOG
- DTRDRP
- LOGLOG
- LOTLIM
- LOUTQM
- NPUSR

For information on the other CONFIG directives and on the CONFIG file in general, refer to the *System Administrator's Guide, Volume I: System Configuration*.

## NTSUSR

NTSUSR specifies the maximum number of NTS and WSI300 TELNET terminal users that can be simultaneously connected to your system. This number does not include remote terminal users using PRIMENET, nor local or NTS assignable lines. The setting of NTSUSR should reflect the expected number of *simultaneous* NTS and WSI300 TELNET users, not the potential number of users. Although there can be thousands of NTS terminals and workstations on a LAN300 network, a much smaller number of NTS and TELNET users are likely to be connected to your system at any one time. Set NTSUSR accordingly. NTSUSR has this format:

### NTSUSR number

where *number* is the maximum number of NTS and WSI300 TELNET terminal users that can be simultaneously connected to your system. *number* must be a nonnegative octal integer; the default is 0, the maximum is 1000<sub>8</sub> (512 decimal).

**NTSUSR Guidelines:** Observe these guidelines when setting the NTSUSR directive:

- NTSUSR + NTUSR + NRUSR + NSLUSR + NPUSR + NAMLC + NTSASL must be less than or equal to the maximum number of user processes supported by your CPU. The maximum is 1700<sub>8</sub> (960 decimal) for the 6350™ and 6550™ and 1130<sub>8</sub> (600 decimal) for all other models.
- NTSUSR + NTSASL must be less than or equal to 1000<sub>8</sub> (512 decimal), the maximum number of NTS lines on a system.

## NTSASL

NTSASL specifies the maximum number of NTS assignable lines that can be assigned simultaneously on your system. *NTS assignable lines* must be mapped to specific ports on specific LTSs with the NTS\_ASSOCIATE command before users can assign them. (For more information on NTS\_ASSOCIATE, see the *System Administrator's Guide, Volume II: Communications Lines and Controllers*.) Once an assignable NTS line is associated and thereby given a PRIMOS line number, users can assign it with the ASSIGN ASYNC command. (For more information on the ASSIGN\_ASYNC, see the *Prime User's Guide*.) NTS assigned lines are typically used for printers, tape drives, and other asynchronous devices. NTSASL has this format:

### NTSASL number

where *number* is an octal number indicating the maximum number of NTS assignable lines that can be assigned simultaneously.

**NTSASL Guidelines:** Observe these guidelines when setting the NTSASL directive:

- NTSASL + NTSUSR + NTUSR + NRUSR + NSLUSR + NPUSR + NAMLC must be less than or equal to the maximum number of user processes supported by your CPU. The maximum is 1700<sub>8</sub> (960 decimal) for the 6350™ and 6550™ and 1130<sub>8</sub> (600 decimal) for all other models.
- NTSASL + NTSUSR must be less than or equal to 1000<sub>8</sub> (512 decimal), the maximum number of NTS lines on a system.

## NTSBUF

NTSBUF sets the I/O buffer sizes and flow control thresholds for the NTS and WSI300 TELNET terminal lines. NTSBUF is for NTS and TELNET terminal lines only; to set the I/O buffer sizes for NTS assignable lines, use the CAB command or the NTSABF configuration directive.

### Note

We recommend that you use the CAB command to set the buffer sizes for NTS lines unless you need to change the flow control thresholds from their default values. Use NTSBUF only if you need to change the XOFF-lag and XON-lag values that govern flow control. For information on CAB, see the section entitled *Modifying PRIMOS.COMI* in this chapter, or the *System Administrator's Guide, Volume II: Communications Lines and Controllers*.

NTSBUF has this format:

```
NTSBUF PRIMOS_line_number [in-buff-size] [out-buff-size]
      [XOFF-lag] [XON-lag]
```

where:

<b>PRIMOS_line_number</b>	Indicates the PRIMOS line number for the NTS or WSI300 TELNET terminal line. At Rev. 22.0, you must enter 0 because this directive currently sets the I/O buffer sizes for all NTS and TELNET terminal lines at once.
<b>in-buff-size</b>	Indicates the terminal input buffer size in halfwords (two characters per halfword). If you enter 0, the input buffer size remains unchanged. The default value is 200 <sub>8</sub> (128 decimal). The minimum value allowed is 10 <sub>8</sub> (8 decimal); the maximum is 7777 <sub>8</sub> (4095 decimal) halfwords.
<b>out-buff-size</b>	Indicates the terminal output buffer size in halfwords (two characters per halfword). If you enter 0, the input buffer size remains unchanged. The default value is 300 <sub>8</sub> (192 decimal). The minimum value allowed is 10 <sub>8</sub> (8 decimal); the maximum is 7777 <sub>8</sub> (4095 decimal).
<b>XOFF-lag</b>	Specifies the number of halfwords in the input buffer that will cause PRIMOS to send an XOFF flow control signal to the terminal. This number must be less than the terminal input buffer size. The default value is 60 percent of the input buffer size, meaning that PRIMOS will flow control the terminal when the input buffer is 60 percent full.
<b>XON-lag</b>	Specifies the number of halfwords in the terminal input buffer that will cause PRIMOS to send an XON flow control signal to the terminal. (PRIMOS sends this signal to reactivate terminal input after it has been suspended with XOFF.) The default value is 20 percent of the input buffer size. In other words, when the buffer falls back to 20 percent utilization, PRIMOS reenables terminal input.



If you attempt to use the NTSBUF directive when NTSUSR is 0, PRIMOS displays this message at the supervisor terminal:

```
Warning: NTSBUF directive issued with no NTS terminal users
configured. This directive is ignored. (CINIT).
```

## NTSABF

NTSABF sets the I/O buffer sizes and flow control thresholds for NTS assignable lines; that is, the set of lines that can be associated with NTS\_ASSOCIATE and then assigned by users. NTSABF is for NTS assignable lines only; to set the I/O buffer sizes for NTS or WS1300 terminal lines, use the CAB command or NTSBUF.

### Note

We recommend that you use the CAB command to set the buffer sizes for NTS assignable lines unless you need to change the flow control thresholds from their default values. Use NTSABF only if you need to change the XOFF-lag and XON-lag values that govern flow control. The CAB command also allows you to configure the buffers of specific NTS assignable lines when they are associated and thereby given PRIMOS line numbers. For information on CAB, see the section entitled *Modifying PRIMOS.COMI* in this chapter, or the *System Administrator's Guide, Volume II: Communications Lines and Controllers*.

NTSABF has this format:

```
NTSABF PRIMOS_line_number [in-buff-size] [out-buff-size]
[XOFF-lag] [XON-lag]
```

where:

<b>PRIMOS_line_number</b>	Indicates the PRIMOS line number for the NTS assignable line. At Rev. 22.0, you must enter 0 because this directive currently sets the I/O buffer sizes for all NTS assignable lines at once.
<b>in-buff-size</b>	Indicates the input buffer size in halfwords (two characters per halfword). If you enter 0, the input buffer size remains unchanged. The default value is 200 <sub>8</sub> (128 decimal). The minimum value allowed is 1; the maximum is 7777 <sub>8</sub> (4095 decimal).
<b>out-buff-size</b>	Indicates the output buffer size in halfwords (two characters per halfword). If you enter 0, the input buffer size remains unchanged. The default value is 300 <sub>8</sub> (192 decimal). The minimum value allowed is 1; the maximum is 7777 <sub>8</sub> (4095 decimal).

- XOFF-lag** Specifies the number of halfwords in the input buffer that will cause PRIMOS to send an XOFF flow control signal to the asynchronous device. This number must be less than the device's input buffer size. The default value is 60 percent of the input buffer size, meaning that PRIMOS will flow control the device when the input buffer is 60 percent full.
- XON-lag** Specifies the number of halfwords in the terminal input buffer that will cause PRIMOS to send an XON flow control signal to the asynchronous device. (PRIMOS sends this signal to reactivate device input after it has been suspended with XOFF.) The default value is 20 percent of the input buffer size. In other words, when the buffer falls back to 20 percent utilization, PRIMOS reenables device input.

If you attempt to use the NTSABF directive when NTSUSR is 0, PRIMOS displays this message at the supervisor terminal:

```
Warning: NTSABF directive issued with no NTS terminal users
configured. This directive is ignored. (CINIT).
```

## LHC

LHC assigns a physical device address to an LHC300 logical device number. An LHC300 (LAN Host Controller 300) is a controller board that connects a 50 Series host to a LAN300 network. LHC300s support PRIMENET, NTS, both PRIMENET and NTS concurrently, or WSI300. NTS will not start on a host unless there is an LHC directive for every LHC300 that is configured for the host in the NTS configuration file. LHC has this syntax:

**LHC logical-device-number device-address**

where:

- logical-device-number** Specifies the LHC300's logical device number. *logical-device-number* must be in the range from 0 through 7. The LHC300 logical device number is also included in the PRIMENET and/or NTS configuration file.
- device-address** Specifies the LHC300's physical device address. The LHC300 physical device address is set by a dip switch on the LHC300. The valid device addresses are: 15<sub>8</sub>, 16<sub>8</sub>, 17<sub>8</sub>, 32<sub>8</sub>, 37<sub>8</sub>, and 56<sub>8</sub>. You can also use the LIST\_COMM\_CONTROLLERS and the STAT COMM commands to show the device addresses of the LHC300s in a system, regardless of whether the LHC300s are configured with LHC directives in the CONFIG file.

If you enter invalid input for the LHC directive, PRIMOS displays an error message during system cold start. For information about the LHC error messages, refer to the *System Administrator's Guide, Volume II: Communication Lines and Controllers*.

## AMLCLK

AMLCLK specifies the baud rate for the software programmable clock for both local and NTS asynchronous lines. AMLCLK has this format:

### AMLCLK baudrate

For NTS lines, *baudrate* must be one of the baud rates listed for the ASYNC JUMPER directive, below. These speeds range from 62<sub>8</sub> through 45400<sub>8</sub> (50 through 19200 decimal). The default value is 22600<sub>8</sub> (9600 decimal).

## ASYNC JUMPER

ASYNC JUMPER defines the line speeds available for assigned lines connected to an LTS over the NTS network. (It also applies to lines that are locally attached via ICS1, ICS2, and ICS3 controllers, but not to lines attached via AMLC controllers.) ASYNC JUMPER has this format:

### ASYNC JUMPER speeda speedb speedc

where *speeda*, *speedb*, and *speedc* are line speeds in octal, specified as bits per second. The following speeds are available:

<i>Speed (bps)</i>	<i>Octal Value</i>	<i>Speed (bps)</i>	<i>Octal Value</i>
50	62 <sub>8</sub>	1800	3410 <sub>8</sub>
75	113 <sub>8</sub>	2400	4540 <sub>8</sub>
110	156 <sub>8</sub>	3600	7020 <sub>8</sub>
150	226 <sub>8</sub>	4800	11300 <sub>8</sub>
200	310 <sub>8</sub>	7200	16040 <sub>8</sub>
300	454 <sub>8</sub>	9600	22600 <sub>8</sub>
600	1130 <sub>8</sub>	19200	45400 <sub>8</sub>
1200	2260 <sub>8</sub>		

The default values for *speeda*, *speedb*, and *speedc* are 75, 150, and 1800 bps, respectively.

Use the SET\_ASYNC command to configure an NTS line to one of three speeds set by ASYNC JUMPER.

## AMLTIM

AMLTIM sets time intervals for three variable event timers: ticks, disctime, and gracetime. Only gracetime (and indirectly ticks) apply to NTS terminal lines. AMLTIM has this format:

AMLTIM [ticks [disctime [gracetime]]]

where *gracetime* indicates the minimum grace period (in octal tenths of a second) for NTS terminal lines that are connected but not logged in. Because the actual grace period is not more than twice the *gracetime* value you give, *gracetime* effectively defines the maximum time granted to an LTS300 user to establish a logged-in process once connected to the system. Note that this meaning applies only for NTS terminals. The previous function of AMLTIM, applying carrier on dial-in lines, still applies to all local asynchronous lines.

The default value, 0, establishes an unlimited gracetime for LTS300 users. The maximum value, 21450<sub>8</sub>, establishes a gracetime of approximately 15 minutes. We recommend that you set *gracetime* to 1130<sub>8</sub> (one minute). This setting is long enough to allow normal users to log in but short enough to discourage unauthorized attempts to access the system. Use values for *ticks* and *disctime* that are appropriate for your locally connected asynchronous lines; they have no effect on NTS lines.

## DISLOG

DISLOG enables or disables automatic logout when a locally attached line is disconnected. DISLOG applies only to locally attached lines; a user on an NTS line is always automatically logged out upon disconnection. PRIMOS considers an NTS line disconnected and logs out the user when it no longer receives the Data Terminal Ready (DTR) signal from the user's line on the LTS300.

If you enter a DISLOG directive with an NTS line number as an argument, PRIMOS ignores the directive and displays the following message on the supervisor terminal. NTS terminal line numbers range from 2000<sub>8</sub> through 2377<sub>8</sub> (1024 through 1279 decimal).

NTS line number specified in DISLOG directive; ignored.

## DTRDRP

DTRDRP controls the dropping of the Data Terminal Ready (DTR) signal associated with local asynchronous lines. This directive has no meaning for NTS lines because it is used for login line modem control, which is not supported by NTS.

## LOGLOG

LOGLOG allows or disallows use of the LOGIN command while the user is already logged in. LOGLOG has this format:

LOGLOG [ YES ]  
          [ NO ]

default value, YES, allows users to use the LOGIN command while already logged in. If a user logs in on a terminal that already has a logged-in user, PRIMOS first logs out the logged-in user, then logs in the new user. Setting LOGLOG to YES has an additional implication for NTS: the NTS connection is not broken upon logout of the initial logged-in user.

NO prevents the use of LOGIN by a logged in user. If a user attempts to log in while already logged in, PRIMOS logs out the user and breaks the NTS connection. The user is prevented from logging in again.

## LOTLIM

LOTLIM specifies the number of minutes allowed for a user to log in. The timer is started when the user first enters LOGIN at either a local or an NTS terminal. LOTLIM has this format:

**LOTLIM minutes**

where *minutes* is a positive octal integer that indicates the number of minutes allowed for a user to log in. We recommend that you use the default value, 3, when using NTS, because it allows users adequate time to type but prevents the wastage of system resources. There is no maximum value for minutes, but it should be less than the time allowed by LOUTQM.

## LOUTQM

LOUTQM specifies the maximum period of inactivity before PRIMOS automatically logs out users. This applies to users on both local and NTS terminals. LOUTQM has this syntax:

**LOUTQM minutes**

where *minutes* is the octal number of minutes of inactivity (minus one) allowed before PRIMOS automatically logs out the user. *minutes* must be greater than 1; the default value is 1750<sub>8</sub> (1000 decimal).

## NPUSR

NPUSR specifies the maximum number of phantom users allowed on the node at one time. It has this format:

**NPUSR number**

where *number* is a positive octal integer that indicates the maximum number of phantom users allowed on the node. The minimum (and default) value is 4. The maximum value is the number of user processes supported by your CPU minus the number of terminal users (NTUSR), NTS terminal users (NTSUSR), PRIMENET remote users (NRUSR), slaves (NSLUSR), assignable lines (NAMLC), and NTS assignable lines (NTSASL). The maximum number of user processes is 17000<sub>8</sub> (960 decimal) for the 6350™ and 6550™ and 1130<sub>8</sub> (600 decimal) for all other models.

#### Note

At Rev. 22.0, you no longer have to reserve phantom slots with NPUSR for LOGIN\_SERVER, TIMER\_PROCESS, and NTS\_SERVER. They are now considered to be *system servers* rather than phantoms. System servers are assigned processes from the pool that PRIMOS reserves for itself, not from the pool of user processes. The LIST\_SYSTEM\_SERVERS and STAT US commands display the system servers running on the system.

When setting NPUSR, ensure that there are enough phantom processes to support all the network services used on the node. The following servers are required:

- LAN300 Network Management: NM\_SERVER and four transient servers, LHC\_DLL\_SERVER, LHC\_ULD\_SERVER, LTS\_DLL\_SERVER, and LTS\_ULD\_SERVER. Since it is unlikely that more than one transient server would be required at once, you need to allow only two phantoms for LAN300 Network Management: one for NM\_SERVER and one for the transient servers.
- WSI300: WSI\_MANAGER, WSIFTP\_USER, one WSIFTP\_SERVER<sub>nn</sub> phantom for each LHC300 dedicated to WSI300 (maximum of two), one phantom for each simultaneous local FTP session, one phantom for each remote FTP session (initiated by a remote FTP user). The maximum number of simultaneous local and remote FTP sessions on a node is 25. For more information, see the *WSI300 User's Guide*.
- PRIMENET: NETMAN
- Route-Through (for PRIMENET gateway nodes): RT\_SERVER
- File Transfer Service (FTS): YTSMAN and at least one file transfer server. There can be as many as seven file transfer servers on a node, as described in the *PRIMENET Planning and Configuration Guide*.

Network-based applications on the node and spoolers may also require phantom processes.

## Modifying PRIMOS.COMI

When installing NTS, you must add the commands described in this section to your PRIMOS.COMI file, which is executed during cold start. Insert the commands in the following order (other commands can be interspersed in between).

- START\_DSM
- COMM\_CONTROLLER
- START\_NTS
- CAB

Although COMM\_CONTROLLER can be placed before START\_DSM without error (START\_NTS cannot), we recommend that you use the order listed above. For more information on these commands, refer to the *Operator's Guide to System Commands*, the *Operator's Guide to Prime Networks*, the *DSM User's Guide*, and the *System Administrator's Guide, Volume II: Communications Lines and Controllers*.

## START\_DSM

START\_DSM starts Distributed Systems Management (DSM) on the local system. In the PRIMOS.COMI file, the START\_DSM command must come after the CONFIG -DATA command that reads the system CONFIG file and after the ADDISK commands that add the *local* disks. START\_DSM should come before the COMM\_CONTROLLER, START\_NTS, and START\_NET commands to ensure that their startup messages are logged. For more information about DSM, refer to the *DSM User's Guide*.

Insert a START\_DSM command with this syntax in your PRIMOS.COMI file:

**START\_DSM**

## COMM\_CONTROLLER

COMM\_CONTROLLER loads the software into the LHC300 controllers in the system. You must insert this command in PRIMOS.COMI before the START\_NTS or START\_NET command. COMM\_CONTROLLER can load all the LHC300s in the system concurrently, so long as they are all using the same software file and protocol. The COMM\_CONTROLLER command in your PRIMOS.COMI file should have the syntax shown below. (Many of the options shown below are abbreviations. For a complete description of COMM\_CONTROLLER, see the *System Administrator's Guide, Volume II: Communication Lines and Controllers*.)

**COMM\_CONTROLLER -LOAD -DEV LHC -ALL -PR token -NQ**

where:

- |                    |   |
|--------------------|---|
| <b>-LOAD</b>       | Initiates a full downline load of the specified file or protocol combination to the controller(s). The controller is automatically shut down, verified, and loaded. |
| <b>-DEVICE LHC</b> | Indicates that the LHC300s are to be loaded.  |
| <b>-ALL</b>        | Indicates that all controllers specified in the -DEVICE option are to be loaded. You cannot use the -DEVICE_ADDRESS option with -ALL.                               |

- PROTOCOL token** Specifies a communications protocol *token* required by the LHC300 controllers. You *must* use this option when downline loading an LHC300. The valid protocol tokens for the LHC300 are: LLCX25, NTS, and TCP\_TEL. Enter NTS for LHC300s running only NTS or LLCX25 *and* NTS for LHC300s running NTS and PRIMENET concurrently. TCP\_TEL is for LHC300s running WSI300; you cannot downline load both the NTS and the TCP\_TEL protocols on the same LHC300.
- NQ** Executes the command without prompting you for confirmation.

The following example shows a simple COMM\_CONTROLLER command to load the LHC300s in a system:

```
COMM_CONTROLLER -LOAD -DEV LHC -ALL -PR NTS -NQ
```

If the LHC300s in the system are not running the same software and protocols, you must issue a separate COMM\_CONTROLLER command for each LHC300. Omit the -ALL and option and use the -DEVICE\_ADDRESS (-DA) option instead. For example, you have to issue separate COMM\_CONTROLLER commands if some LHC300s in the system are running only NTS, while others are running both NTS and PRIMENET. -DEVICE\_ADDRESS has this format:

**-DEVICE\_ADDRESS device\_address**

where *device\_address* is a two-digit octal number that indicates the address of the LHC300 to be loaded. You can determine this address by using either the STATUS COMM or the LIST\_COMM\_CONTROLLER commands. The following example shows a set of COMM\_CONTROLLER commands to load one LHC300 for NTS and another one for WSI300:

```
COMM_CONTROLLER -LOAD -DEV LHC -DA 56 -PR NTS -NQ
```

```
COMM_CONTROLLER -LOAD -DEV LHC -DA 37 -PR TCP_TEL -NQ
```

## START\_NTS

START\_NTS starts NTS on the host and also starts LAN300 Network Management if it has not already been started by the START\_NET command.

Place START\_NTS near the beginning of PRIMOS.COMI, but after the COMM\_CONTROLLER and START\_DSM commands, to give NTS adequate time to initialize itself. You must create the NTS configuration file before issuing this command. START\_NTS has this syntax:

```
START_NTS [config_pathname]
```

where *config\_pathname* indicates the pathname of the NTS configuration file. The default pathname is NTS\*>NTS.CONFIG.



## CAB

The CAB command sets the buffer sizes for all types of asynchronous lines; for a full description, see the *System Administrator's Guide, Volume II: Communications Lines and Controllers*. For hosts running Rev. 22.0, we recommend that you use the CAB command rather than the NTSBUF and NTSABF CONFIG directives, unless you need to change the flow control thresholds from their default values.

A CAB -NTSBUF command in your PRIMOS.COMI file sets the buffer sizes that will be allocated to all NTS terminal lines as they become active. A CAB -NTSABF command serves the same purpose for NTS assignable lines. There is no way to preset the buffer sizes for specific NTS lines, because they are not given line numbers until they become active (NTS terminal lines) or are associated (NTS assignable lines). However, you can use CAB to change the buffer sizes for specific NTS lines once they become active or associated, because they then have a PRIMOS line number that you can use. (For more information, see the section below entitled Setting Buffer Sizes for Specific Lines.) The following sections show the formats of the CAB commands for your PRIMOS.COMI files.

**Setting Buffer Sizes for NTS Terminal Lines:** To set the size of the buffers that will be allocated to all NTS terminal lines as they become active, insert a CAB command with the following format in your PRIMOS.COMI file.

**CAB -NTSBUF -IBS nnn -OBS nnn**

where:

- NTSBUF**            Instructs CAB to set the buffer sizes that will be allocated to all NTS terminal lines as they become active.
- IBS nnn**            Sets the input buffer size. *nnn* is the decimal number of eight-bit characters that can be held in the buffer. The default value used at cold start is 256 characters; the legal range is from 2 to 8190. Other than at cold start, if you omit -IBS or supply a value of 0, CAB uses the current input buffer size.
- OBS nnn**            Sets the output buffer size. *nnn* is the decimal number of eight-bit characters that can be held in the buffer. The default value used at cold start is 384 characters; the legal range is from 100 to 8190. Other than at cold start, if you omit -OBS or supply a value of 0, CAB uses the current output buffer size.

If you omit either -IBS or -OBS, CAB does not change the size of the buffer you omit. You cannot omit both options. The following example shows a CAB command used in a PRIMOS.COMI file to set the buffer sizes for NTS terminal lines.

```
CAB -NTSBUF -IBS 1792 -OBS 1792
```

**Setting Buffer Sizes for NTS Assignable Lines:** To set the size of the buffers that will be allocated to all NTS assignable lines as they are associated, insert a CAB command with the following format in your PRIMOS.COMI file.

**CAB -NTSABF -IBS nnn -OBS nnn**

where:

- NTSABF**            Instructs CAB to set the buffer sizes that will be allocated to all NTS assignable lines as they are associated.
- IBS nnn**            Sets the input buffer size. *nnn* is the decimal number of eight-bit characters that can be held in the buffer. The default value used at coldstart is 256; the legal range is from 2 to 8190. Other than at cold start, if you omit **-IBS** or supply a value of 0, CAB uses the current input buffer size.
- OBS nnn**            Sets the output buffer size. *nnn* is the decimal number of eight-bit characters that can be held in the buffer. The default value used at cold start is 384; the legal range is from 100 to 8190. Other than at cold start, if you omit **-OBS** or supply a value of 0, CAB uses the current output buffer size.

If you omit either **-IBS** or **-OBS**, CAB does not change the size of the buffer you omit. You cannot omit both options. The following example shows a CAB command used in a PRIMOS.COMI file to set the buffer sizes for NTS assignable lines.

```
CAB -NTSABF -IBS 1792 -OBS 1792
```

**Verifying Buffer Sizes:** To verify that the CAB command has established the correct NTS buffer sizes, insert a LAB command with the following syntax in your PRIMOS.COMI file:

```
LAB -NTSBUF -NTSABF
```

LAB presents a display similar to the following on the supervisor terminal:

```
-----
|           || Initial Buffer Sizes | |
|           ||-----|
|           ||   Input   |   Output   |
|-----| |-----|-----|
| NTSBUF  ||   1792   |   1792   |
|-----| |-----|-----|
| NTSABF  ||   1792   |   1792   |
|-----| |-----|-----|
-----
```

**Setting Buffer Sizes for Specific Lines:** Once an NTS user connects to your node, an NTS line becomes active. You can enter STAT USER to display its line number, then enter a CAB command to change its input and output buffer sizes. Likewise, once an NTS assignable line is associated with NTS\_ASSOCIATE, you can enter NTS\_LIST\_ASSOCIATE to display its line number. You can use CAB from the supervisor terminal to change the buffer sizes of any NTS line. However, if the buffer sizes have been changed by an application program running on

the line, your changes will not take effect until the application terminates. The following example shows the CAB command to change the buffer sizes on line 1025:

```
CAB -LINE 1025 -IBS 128 -OBS 128
```

You can also use CAB from a nonsupervisor terminal to configure a line, provided that you have DSM privileges to use CAB. You must also include the `-ON` option in your command line, even if the target line is on the local node. (For more information on DSM, see the *DSM User's Guide*.) The following example shows the syntax to configure an NTS line from a nonsupervisor terminal:

```
CAB -LINE 1026 -IBS 128 -OBS 128 -ON
```

You cannot use CAB in your PRIMOS.COMI file to configure a specific line unless it follows an NTS\_ASSOCIATE command. NTS\_ASSOCIATE maps an NTS assignable line to a specific port on a specific LTS. Once you have given the assignable line a PRIMOS line number with NTS\_ASSOCIATE, you can then use CAB to configure the line's buffers. For example:

```
NTS_ASSOCIATE -LINE 1027 -LTS_NAME harry -LTS_LINE 4
CAB -LINE 1027 -IBS 128 -OBS 128 -ON
```

## Configuring DSM for LAN300 Network Management

We recommend that you configure the Distributed Systems Management (DSM) Unsolicited Message facility to handle LAN300 network management event messages. Otherwise, these event messages are placed in the default log on the local system, `DSM*>LOGS>UMH>DEFAULT.LOG`. It is better to have them sent to private logs in the `NETWORK_MGT*` directory. Using `CONFIG_UM`, create three private logs in the `NETWORK_MGT*` directory: `NMSR.LOG`, `DLL.LOG`, and `ULD.LOG`. The example below illustrates this procedure:

```
CONFIG_UM NMSR -SEL
```

```
CONFIG_UM Rev. 21.0.26 Copyright (c) 1987, Prime Computer, Inc.
```

```
Product Name: NMSR
Product Name: <RETURN>
Severity -ANY
Destination: LOGGER NETWORK_MGT*>NMSR.LOG -PLOG
Destination: <RETURN>
Do you wish to edit this selection ? NO
Configuring NMSR on EN.P86.
Completed OK
```

**CONFIG\_UM DLL -SEL**

CONFIG\_UM Rev. 21.0.26 Copyright (c) 1987, Prime Computer, Inc.

Product Name: **CONTROLLER\_DLL**

Product Name: **<RETURN>**

Severity **-ANY**

Destination: **LOGGER NETWORK\_MGT\*>DLL.LOG -PLOG**

Destination: **<RETURN>**

Do you wish to edit this selection ? **NO**

Configuring NMSR on EN.P86.

Completed OK

**CONFIG\_UM ULD -SEL**

CONFIG\_UM Rev. 21.0.26 Copyright (c) 1987, Prime Computer, Inc.

Product Name: **CONTROLLER\_ULD**

Product Name: **<RETURN>**

Severity **-ANY**

Destination: **LOGGER NETWORK\_MGT\*>ULD.LOG -PLOG**

Destination: **<RETURN>**

Do you wish to edit this selection ? **NO**

Configuring NMSR on EN.P86.

Completed OK

After performing the steps in this chapter, your final tasks are to create the NTS configuration file as described in Chapters 3, 4, and 5, and then cold start the system.

---

# 3

## Preparing to Configure an NTS Network

This chapter describes the NTS configuration file, explains the information you need to create it, and provides a checklist to help you prepare for configuration. You should read this chapter and complete the checklist before using CONFIG\_NTS to create your NTS configuration file. The chapter has this structure:

- NTS Configuration File
- Elements of the NTS Configuration
- Configuration Checklist

### NTS Configuration File

This section describes the NTS configuration file. It contains this information:

- Introduction
- Relation to the PRIMENET Configuration File
- Ensuring Naming Uniqueness and Consistency
- Making Configuration Changes Take Effect

#### Introduction

For NTS to work properly, each Prime host on the network must have certain information. For example, each host must know

- What LHC300s in each host are attached to what LAN300.
- What network address corresponds to a given LTS300 logical name.
- Whether to accept connections from unconfigured nodes (LTS300s).
- Which hosts are responsible for downline loading LTS300 software, receiving upline dumps of LTS300 software, and collecting event reports.

This information makes up the NTS configuration and is stored in a segment directory called the NTS configuration file.

The CONFIG\_NTS program, described in Chapter 4, Configuring an NTS Network, helps you create a global configuration file. This file is global in the sense that it describes every LAN300, host, and LTS300. Thus, you need to create only one configuration file, then load it into every Prime host running NTS. This greatly simplifies the process of modifying the configuration because you only need to edit one configuration file when making a change, instead of a different file for every host. However, you do have to load the edited file into every Prime host on the network before it takes effect. CONFIG\_NTS holds the file open while you are editing it to prevent simultaneous editing by someone else.

Although you can accomplish logical subnetting by having different NTS configuration files running on different hosts in the network, we do not recommend that you do so unless you have a very good reason.

## Relation to the PRIMENET Configuration File

All information pertaining to PRIMENET running on the LAN300, and PRIMENET in general, is contained in the PRIMENET configuration file created by CONFIG\_NET. Although PRIMENET and NTS can run concurrently on the same LAN300, their configuration files are unrelated. However, you must use the host name given in the SYSNAM CONFIG directive for both configuration files. You must also use the same name for the LAN300 in both configuration files. Otherwise, you will be unable to start NTS or PRIMENET when the other service is already running. Both START\_NET and START\_NTS check for system and LAN300 name consistency before starting PRIMENET or NTS. For more information on START\_NET and START\_NTS, refer to the *Operator's Guide to Prime Networks*.

## Ensuring Naming Uniqueness

All the names in an NTS configuration file come from the same name space. In other words, all the names in the configuration have to be unique. This includes LAN300 names, host names, and LTS300 names. It is not enough that a configuration entity's name (a LAN300 name, host name, or LTS300 name) be unique among the names on its LAN300. The name must be unique among all configuration entities on all LAN300s in the configuration.

## Making Configuration Changes Take Effect

If NTS is currently started, LTS300 configuration changes take effect dynamically (automatically) when you save the NTS configuration file on disk. CONFIG\_NTS displays this message after it updates the NTS online database:

```
Configuration saved; active configuration updated.
```

The *active configuration* is the one that is loaded into the NTS database. Note that dynamic updates occur only if you are at the supervisor terminal or are a member of the network management Access Control List group (ACL group). Only LTS300 configuration changes are dynamic. To make LAN300 and host configuration changes take effect, the network operator must stop each Prime host on the network with the STOP\_NTS command, then restart each host with the START\_NTS command, using the name of the new configuration file as an argument. START\_NTS loads the updated configuration file into the NTS online database. (Only the hosts that require the configuration changes need be stopped and restarted.) For more information on START\_NTS and STOP\_NTS, see the *Operator's Guide to Prime Networks*.

## Elements of the NTS Configuration

This section describes the information that makes up the NTS configuration file. Understanding what is required before you create the configuration file itself can greatly expedite the configuration process. This section has this structure:

- LAN300 Configuration Information
- Host Configuration Information
- LTS300 Configuration Information

### LAN300 Configuration Information

The LAN300 section of your NTS configuration names and configures the LAN300s included in your configuration. As many as 32 LAN300s can be included in an NTS configuration file.

**LAN300 Names:** Because each host can be attached to as many as six different LAN300s, it is necessary to distinguish them with logical names. LAN300 names can contain a maximum of 32 characters. The first character must be a letter, but the other characters can be any combination of letters, numbers, dollar signs (\$), periods (.), or underscores (\_). CONFIG\_NTS defaults the LAN300 names to the form LAN300-*nn*, where *nn* is a number from 1 through 32.

You must use the same name for the LAN300 that is used in your PRIMENET configuration file, if you have one. Otherwise, if you attempt to start NTS while PRIMENET is already running on the LAN300, START\_NTS detects the naming inconsistency and does not start NTS. START\_NET also checks for LAN300 name consistency when you attempt to start PRIMENET on a LAN300 on which NTS is already running.

**Unconfigured Nodes:** The LAN300 configuration indicates whether unconfigured nodes are allowed on the network; that is, whether hosts should accept connection requests from unconfigured nodes. In NTS networks, an **unconfigured node** is an LTS300 that is attached to the LAN300 but not included in the NTS configuration file. If unconfigured nodes are allowed, the NTS host software does not even check that the address of the calling (source) LTS is within the valid range of addresses for Prime LTS300s. You cannot assign lines or perform LAN300 Network Management functions on an unconfigured LTS300 because it does not have a name that can be used as an argument in commands.

Allowing unconfigured nodes gives you the flexibility of adding LTS300s to the network without modifying and redistributing the configuration file. A LAN300 where unconfigured nodes are allowed is an "open" network; any LTS, configured or not, can connect to any host. However, such an "open" network is not as secure as a "closed" network in which unconfigured LTS300s are not allowed. In an open network there is no checking to see if the calling LTS300 is actually in the configuration file. Anyone can attach an LTS300 to the LAN300, connect to any host, and attempt to log in.

In WSI300 networks, an unconfigured node is a Prime or non-Prime system (typically a workstation) that is using TCP/IP TELNET software to connect to a 50 Series host. You must allow unconfigured nodes if Work Station Interconnect 300 (WSI300) is to be used on the LAN300, because remote systems using TELNET appear to be unconfigured nodes to the 50 Series host.

## Network Management Functions

The LAN300 Network Management Facility is a layer of software that provides service functions to the LAN300. These functions are LHC300 and LTS300 downline loading and upline dumping, error and event reporting, statistics gathering, status commands, and a diagnostic loopback capability. For more information on LHC300 and LTS300 services, refer to Chapter 1, Planning an NTS Network. For more information on using LAN300 Network Management for network monitoring, refer to the *Operator's Guide to Prime Networks*.

The network management section of the LAN300 configuration indicates which hosts on the LAN300 respond to LTS300 requests for downline loads of software. It also indicates which hosts receive upline dumps of LTS300 software and which hosts collect event and error reports sent by the LTS300s on the network. The hosts just mentioned are referred to as **downline load hosts**, **upline dump hosts**, and **event reporting hosts**. Do not configure network management functions for a host that is running only WSI300.

**LTS300 Downline Load Hosts:** LTS300 downline load hosts load software into LTS300s across the network. This service is required because LTS300s have no permanent storage capability. When an LTS300 needs to be downline loaded, it multicasts a request on the network. All NTS hosts can provide the downline load; host status and the NTS configuration file determine which one does. If the primary downline load host is down, the secondary host senses its absence and responds to the boot request. If both are down, the other hosts sense this and it becomes a free forum, with all capable hosts responding to the request. The LTS300 then picks the host with the most pending requests.

Configuring primary and secondary downline load hosts can conserve network resources because of the way the downline load service is implemented. When the responsible host receives an LTS300 downline load request, it responds with a *boot multicast channel address* and waits 15 seconds in case other LTS300s need to be loaded. The host then multicasts the downline load file on the specified channel address, where all of the LTS300s can pick it up concurrently.

**LTS300 Upline Dump Hosts:** LTS300 upline dump hosts receive upline dumps of LTS300 software, which are used to analyze software failures. All hosts are capable of receiving these upline dumps; host status and the NTS configuration determine which one does. If the primary



upline dump host is down, the secondary host senses its absence and receives the LTS300 upline dumps that are multicast on the network. If both the primary and secondary hosts are down, all of the active hosts receive the dumps. Thus, configuring primary and secondary hosts can conserve network resources by preventing the redundant logging of LTS300 upline dumps.

**LTS300 Event Reporting Hosts:** The LTS300 event logging service allows LTS300s to log warning, error, and event messages to a network host. This is required because LTS300s do not run Distributed Systems Management (DSM). The host logs these messages to the local DSM Unsolicited Message facility, where they are placed in the file `NETWORK_MGT*>NMSR.LOG`. You must use `CONFIG_UM` to ensure that this file exists, as described in the section entitled *Configuring DSM for LAN300 Network Management* in Chapter 2, *Installing NTS*.

LTS300s multicast their error and event messages on the network where they are logged by the appropriate host, as determined by host status and this section of the configuration file. If the primary host is down, the secondary host logs the messages. If both are down, all of the capable hosts in the network log the messages. Configuring primary and secondary event reporting hosts conserves network resources by preventing the redundant logging of LTS300 messages.

## Host Configuration Information

A host is a 50 Series computer connected to one or more LAN300 networks by one or more LAN Host Controller 300 (LHC300) boards. The elements of the host configuration are host naming and LHC300 numbering and mapping.

**Host Naming:** The first step in host configuration is to assign a logical name to each host. This allows users to specify the host names when requesting connections, rather than cumbersome addresses. It also allows load balancing because a host can be connected to a LAN300 by more than one LHC300, each of which has its own address. Thus, the user can simply use the host's logical name in connection requests, allowing NTS to transparently select the least utilized LHC300 for the connection.

Host names can contain a maximum of six characters. The first character must be a letter, but the other characters can be any combination of letters, numbers, periods (.), dollar signs (\$), and underscores (\_). Use the host name given by the `SYSNAM CONFIG` directive for both the NTS and `PRIMENET` configuration file (if you have one). Remember that because all names in the NTS configuration come from the same name space, all names must be unique. This includes LAN300 names, host names, and LTS names.

**LHC300 Numbering and Mapping:** The second step in creating a host configuration is specifying the logical device number of each LHC300 and indicating the LAN300 to which it is connected. Each LHC300 in a host has a unique logical device number in the form `LHC0n`, where *n* is a number from 0 through 7. These logical device numbers are assigned by LHC directives in the node's `CONFIG` file. For more information on the LHC directive, see Chapter 2, *Installing NTS*.

## LTS300 Configuration Information

LTS300 configuration consists of assigning a logical name to each LTS300 on your LAN300s, indicating the LAN300 to which it is attached and giving its address. An LTS300 can be attached to only one LAN300 at a time. LTS300 naming allows you to use logical names rather than cumbersome addresses in commands such as `LIST_LTS_STATUS`, `NTS_ASSOCIATE`, `NTS_UNASSOCIATE`, and `NTS_LIST_ASSOCIATE`. Names also provide *location and address transparency*; you can continue to call an LTS300 by its logical name even if its address and location have been changed (provided that the configuration file is updated).

**LTS300 Logical Names:** LTS300 logical names can be a maximum of 16 characters. The first character must be a letter, but the other characters can be any combination of letters, numbers, periods (.), underscores (\_), or dollar signs (\$). In addition, `CONFIG_NTS` checks that LTS300 logical names are unique among all the names in the entire configuration, including LAN300 names, host names, and LTS300 names. It is not sufficient that they be unique only among the LTS300s attached to their LAN300. This global uniqueness allows you to use commands such as `LIST_LTS_STATUS` without using an `-ON LAN` option to specify the LAN300 to which the LTS is attached.

**Addresses:** The LTS300 configuration serves to associate a logical name with an LTS300's address. The address of an LTS300 cannot be altered, because it is burned into the LTS300 PROM during manufacturing and marked on a tag attached to the LTS300. All you need to do is to copy the address from the tag and enter it into the NTS configuration file.

## LTS300 Line Configuration

Each LTS300 has eight lines to which you can attach terminals or other asynchronous devices. You do not set LTS300 line parameters with `CONFIG_NTS`. Instead, NTS terminal users set their own line parameters with LTS300 user commands such as `SET` and `PORT`. For more information, refer to the *NTS User's Guide*. In addition, NTS users, system operators, and administrators can change NTS line parameters using the PRIMOS command, `SET_ASYNC`. For more information, refer to the *System Administrator's Guide, Volume II: Communication Lines and Controllers*. For NTS assigned lines and login lines, the line parameters are often set by the host application being used.

## Configuration Checklist

This section contains sets of questions that you should answer before using `CONFIG_NTS` to configure your network. The answers to these questions, together with a sketch of your network(s), should prepare you for the process of configuration. If you need more information about any of these questions, refer to the section entitled Elements of the NTS Configuration earlier in this chapter.

The configuration checklist is divided into these sections:

- Questions for Each LAN300
- Questions for Each Host
- Questions for Each LTS300

## Questions for Each LAN300

These questions pertain to your LAN300 network(s) as a whole.

- What is the name of the LAN300? \_\_\_\_\_
- Are unconfigured nodes allowed on the LAN300 (answer YES if the WSI300 TELNET program will be used)? \_\_\_\_\_
- Which hosts perform these network management functions on the LAN300:
  - o Primary LTS300 downline load host \_\_\_\_\_
  - o Secondary LTS300 downline load host \_\_\_\_\_
  - o Primary LTS300 upline dump host \_\_\_\_\_
  - o Secondary LTS300 upline dump host \_\_\_\_\_
  - o Primary LTS300 event reporting host \_\_\_\_\_
  - o Secondary LTS300 event reporting host \_\_\_\_\_

## Questions for Each Prime Host

Answer these questions for each Prime host in your configuration:

- What is the logical name given for the host by its SYSNAM CONFIG directive?  
\_\_\_\_\_
- What are the logical device numbers of the LHC300s installed in the host (in the form LHC0n, where n is a number from 0 through 7)? \_\_\_\_\_
- To which LAN300 is each LHC300 attached? \_\_\_\_\_

## Questions for Each LTS300

Answer these questions for each LTS300 in your configuration:

- What is the LTS300's logical name? \_\_\_\_\_
- What is the LTS300's address? (The address is printed on a tag attached to the bottom of the unit.) \_\_\_\_\_

---

# 4

## Configuring an NTS Network

This chapter explains how to configure your NTS network(s) with CONFIG\_NTS, the NTS configuration program. It contains information on these topics:

- Introduction to CONFIG\_NTS
- Invoking CONFIG\_NTS
- Using CONFIG\_NTS
- CONFIG\_NTS Main menu
- CONFIG\_NTS Screen Hierarchy
- LAN300 Configuration
- Host Configuration
- LTS300 Configuration
- Saving a Configuration
- Displaying, Listing, or Spooling a Configuration
- Terminating CONFIG\_NTS

### Introduction to CONFIG\_NTS

CONFIG\_NTS is a menu-driven and prompt-driven program that handles configuration files for NTS networks. It is organized in a hierarchy of menus, which allow you to perform all functions without learning a special operating language. These functions are:

- Creating or Modifying NTS Configuration Files
- Saving NTS Configuration Files on Disk
- Displaying, Listing, or Spooling NTS Configuration Files
- Displaying Help Information

CONFIG\_NTS also validates your input as you proceed. If it detects invalid data, it displays an error message and positions the cursor for your corrections.

## CONFIG\_NTS Configuration Session

The period of time between invoking CONFIG\_NTS and terminating it is a **configuration session**. This section describes configuration sessions for creating or editing configuration files, but both types of sessions are very similar.

**Configuration Session to Create a New Configuration:** This list summarizes a typical configuration session for creating a new configuration file:

1. Enter CONFIG\_NTS, optionally specifying the pathname of the configuration file to be created. If you do not enter a pathname on the command line, CONFIG\_NTS prompts you to supply one. You can accept the default pathname (NTS\*>NTS.CONFIG) by pressing  without making an entry.
2. CONFIG\_NTS displays the Main menu for you to choose the function you want to perform.
3. Select **Configure LAN**. CONFIG\_NTS prompts you for the name and configuration information for each LAN300 to be defined in the configuration file.
4. Return to the Main menu and select **Configure Host by LAN**. CONFIG\_NTS prompts you for the name of the LAN300, and then for the name and configuration information for each host to be attached to it. Repeat this step for each LAN300 in the configuration.
5. Return to the Main menu and select **Configure LTS by LAN**. CONFIG\_NTS prompts you for the name of the LAN300, and then for the name of each LTS300 to be attached to it. Repeat this step for each LAN300 in the configuration.
6. Return to the Main menu and select **Save current configuration**. CONFIG\_NTS saves the configuration file on disk, giving it the pathname you specified when you invoked the program.
7. Select **Display, list or spool configuration** to display the configuration file on your terminal, write it to a disk file, or send it to the print spool. You should keep a hard copy of your configuration file for future reference. Select **Quit configuration session** to terminate CONFIG\_NTS.

For an example of a configuration session for creating a new configuration file, refer to the section entitled Example One: Creating a New NTS Configuration in Chapter 5, Sample NTS Configurations.

**Configuration Session to Edit an Existing Configuration:** This list summarizes a typical configuration session for editing an existing NTS configuration file:

1. Enter CONFIG\_NTS, specifying the pathname of the configuration file to be edited.
2. CONFIG\_NTS displays the Main menu for you to choose the function you want to perform.

3. If you need to update the LAN300 configuration, select **Configure LAN**. CONFIG\_NTS displays a list of the LAN300s in the configuration. Press `Return` until the arrow points at the LAN300 you want to edit, then enter E. CONFIG\_NTS displays the Edit LAN screen, which allows you to update the LAN300's configuration.
4. If you need to modify any of the host configurations, return to the Main menu and select **Configure Host by Name**. CONFIG\_NTS displays an alphabetical list of the hosts in the configuration. Press `Return` until the arrow points at the host you want to edit, then enter E. CONFIG\_NTS displays the Edit Host screen, which allows you to update the host's configuration.
5. If you need to modify any of the LTS300 configurations, return to the Main menu and select **Configure LTS by Name**. CONFIG\_NTS displays an alphabetical list of the LTS300s in the configuration. Press `Return` until the arrow points at the LTS300 you want to edit, then enter E. CONFIG\_NTS displays the Edit LTS screen, which allows you to update the LTS300's configuration.
6. Return to the Main menu and select **Save current configuration**. CONFIG\_NTS saves the configuration file on disk.
7. Select **Display, list or spool configuration** to display the configuration file on your terminal, write it to a disk file, or send it to the print spool. You should keep a hard copy of your configuration file for future reference. Select **Quit configuration session** to terminate CONFIG\_NTS.

For an example of an editing session, refer to the section entitled Example Two: Editing an Existing NTS Configuration in Chapter 5, Sample NTS Configurations.

## Invoking CONFIG\_NTS

The CONFIG\_NTS command invokes the CONFIG\_NTS program. It has three formats, the first of which displays help on its command syntax and usage:

### CONFIG\_NTS -HELP

The second format invokes the program to create a new NTS configuration file or edit an existing one:

$$\text{CONFIG\_NTS [config-file] } \left[ \begin{array}{l} \text{-EDIT} \\ \text{-CREATE} \end{array} \right] \left[ \text{-TERMINAL\_TYPE } \left\{ \begin{array}{l} \text{PT200} \\ \text{PST100} \\ \text{PT45} \\ \text{TTY} \end{array} \right\} \right]$$

where:

- config-file** Specifies the pathname of the NTS configuration file to be created, or the name of the existing configuration file to be edited. If you omit *config-file* from the command line, CONFIG\_NTS prompts you for the name of the configuration file to use. If you press  without typing a file name, CONFIG\_NTS uses the default file name, NTS\*>NTS.CONFIG. Thus, the simplest usage of this command is CONFIG\_NTS.  
  
CONFIG\_NTS uses PRIMOS standard suffix rules when interpreting the pathname specified in *config-file*. The suffix for NTS configuration files is .CONFIG. Thus, if you omit the .CONFIG suffix from *config-file* and *config-file*.CONFIG exists, that file is opened. You must include the .CONFIG suffix when creating a new configuration file.
- EDIT** Instructs CONFIG\_NTS to modify an existing configuration file. *config-file* must already exist and be a valid NTS configuration file.
- CREATE** Instructs CONFIG\_NTS to create a new configuration file. When you use this option, *config-file* is created if it does not already exist. If it does already exist, CONFIG\_NTS prompts you for confirmation before discarding the existing configuration file.
- TERMINAL\_TYPE** Specifies the type of terminal you are using: PT200, PST 100, PT45, or TTY. Use TTY (teletype) for all video and hardcopy terminals other than the first three listed.  
  
If you do not specify your terminal type on the command line, CONFIG\_NTS checks to see if your global variable .TTP is defined. If that variable has a value of PT200, PST100, PT45, or TTY, CONFIG\_NTS uses that value. Otherwise, it defaults to TTY.

The third command format allows you to list an NTS configuration file without entering into a dialog with CONFIG\_NTS. This listing can be displayed on your screen (-DISPLAY option), entered into an output file (-LISTING option), or spooled for printing (-SPOOL option). CONFIG\_NTS exits after producing the listing. Although NTS configuration files are segment directories, these options cause CONFIG\_NTS to display them in a readable format. The command syntax is:

```
CONFIG_NTS [config-file] [ -DISPLAY [-NO_WAIT]
                        -LISTING [output-file]
                        -SPOOL [spool-options] ]
```

where:

- config-file** Specifies the pathname of the configuration file to be displayed. If you omit the pathname, CONFIG\_NTS lists the default configuration file, NTS\*>NTS.CONFIG, without querying you. CONFIG\_NTS displays an error message if you specify a configuration file that does not exist.
- DISPLAY** Displays the configuration file on your terminal's screen. CONFIG\_NTS pauses every 23 lines and displays the **--More--** prompt. Press  to view the next screen of data, or enter Q or N to quit. If you want an uninterrupted display, include the **-NO\_WAIT** option on the command line.
- LISTING** Writes the configuration file into *output-file*. If you do not specify *output-file* on the command line, CONFIG\_NTS creates a default file. It gives this file the same name as the configuration file being listed, except that it removes the existing suffix, if any, and appends the .LIST suffix.
- SPOOL** Spools the configuration file to a printer. Any options that you include on the command line are passed on as arguments and options to the SPOOL command.

## Using CONFIG\_NTS

This section provides general information about using CONFIG\_NTS. It presents these topics:

- CONFIG\_NTS Display for Various Terminal Types
- Entering Input
- Default and Current Values
- Error Conditions
- Returning to the Main Menu
- Displaying Help Text
- Summary of Special Function Keys
- Access Rights and File Checking

### CONFIG\_NTS Display for Various Terminal Types

When you invoke CONFIG\_NTS, you can specify the terminal you are using with the **-TERMINAL\_TYPE** option on the command line. If you do not specify your terminal type on the command line, CONFIG\_NTS checks to see if your global variable .TTP is defined. If that variable has a value of PT200, PST100, PT45, or TTY, CONFIG\_NTS uses that value.



Otherwise, it defaults to TTY. CONFIG\_NTS runs on PT200™, PST 100™, PT45™, or TTY terminals. The TTY category includes any kind of video or hardcopy terminal. The only difference is in the manner of display, which is described below.

**CONFIG\_NTS Display for PT200, PST 100, and PT45 Terminals:** On PT200, PST 100, and PT45 terminals, CONFIG\_NTS uses full screen displays. That is, it performs a clear screen operation after each screen of data. In addition, the program presents additional prompts, help messages, and error messages in the appropriate place on the screen, and positions the cursor where you need to make corrections. Default or current values are displayed to the right of the prompts, allowing you to accept them by simply pressing . To enter a new value, overwrite the displayed value and press . Although the illustrations in this manual show the full screen displays for PT200, PST 100, and PT45 terminals, the screen displays for TTY terminals are very similar.

**CONFIG\_NTS Display for Other Terminal Types:** On other terminal types, both video and hardcopy, CONFIG\_NTS presents its displays in scrolling mode. Error messages and other special prompts also scroll up the page or screen. All prompts are displayed on a new line, with the default or current value enclosed in square brackets. The cursor (if there is one) is not placed over the value in the square brackets. To enter a new value, simply type it in and press . If the total number of characters on the line exceeds 80, including the prompt and default or current value, CONFIG\_NTS wraps to the next line and indents several spaces before continuing.

## Entering Input

To enter input, type the information in either uppercase or lowercase and press . (CONFIG\_NTS is not case sensitive.) Press BACK SPACE to logically delete the last character typed. Typing the semicolon (;) works like pressing  in terminating your input to a field, but it returns you to the main prompt at the bottom of the display, rather than moving you to the next input field.

## Default and Current Values

At the end of each prompt, CONFIG\_NTS displays a value enclosed in square brackets. If you are creating a new configuration or adding a new LAN300, host, or LTS300, this is the default value. If you are editing an existing configuration, this is the current (existing) value. In either case, with any type of terminal, you can accept this value by pressing . On PT200, PST 100, and PT45 terminals, the cursor is positioned on top of the displayed value. To enter a new value, overwrite the displayed value and press . On all other terminal types, the cursor (if there is one) is positioned after the displayed value. To enter a new value, type it in and press .

## Error Conditions

When you enter invalid data, CONFIG\_NTS displays an error message. On PT200, PST 100, and PT45 terminals, CONFIG\_NTS displays this message on the bottom line of the screen, then repositions the cursor in the field in error. On all other terminal types, it displays the error message, then redisplay the prompt for which you entered the erroneous input.

## Returning to the Main Menu

To return to the Main menu from anywhere in the program, enter the at-sign character (@).

## Displaying Help Text

To display help text, type the question mark character (?) and press Return. On PST 100 and PT200 terminals, you can also press the HELP key. For general help information about using the program, return to the Main menu and enter H to choose the **Help** selection.

## Summary of Special Function Keys

This section summarizes the special function characters used for CONFIG\_NTS editing.

<i>Key</i>	<i>Function</i>
BACK SPACE	Logically deletes the last character typed.
RETURN	Accepts your input.
;	Accepts your input to a field and moves you to the main prompt at the bottom of the screen, rather than to the next input field.
@	Returns you to the Main menu.
?	Displays help information.
HELP	Displays help information on PST 100 and PT200 terminals.

## Access Rights and File Checking

To access an NTS configuration file, you must have delete, add, list, use, read, and write Access Control List (ACL) rights (DALURW). CONFIG\_NTS displays an error message if it finds that you have insufficient access rights.

If you have sufficient access rights, CONFIG\_NTS attempts to open the specified file. If the file exists, CONFIG\_NTS checks its type, format, and checksum. Failure of any of these tests causes the program to assume that the file is not an NTS configuration file, in which case it displays an error message and exits. If the file does not exist and you used the `-CREATE` option, CONFIG\_NTS creates the file and gives you the proper access rights. Unless you perform a save operation during the session, the newly created file is deleted when you leave the program.

## CONFIG\_NTS Main Menu

When you invoke CONFIG\_NTS without using the -DISPLAY, -LIST, or -SPOOL options, the program displays the Main menu, illustrated in Figure 4-1. This menu provides access to the main functions of the program. (When you use the -DISPLAY, -LIST, or -SPOOL options, CONFIG\_NTS displays, files, or prints the configuration file specified, then exits.)

```

CONFIG_NTS, rev. 21.0      Edit config. file <TPTHOR>NTS*>NTS.CONFIG

First line of notes
Second line of notes

File created on 04 Mar 87 at 9:01 by HARRY
Last edited on 09 Jul 87 at 8:42 by HARRY

1.  Configure LAN           H.  Help
2.  Configure Host by LAN   S.  Save current configuration
3.  Configure Host by Name  Q.  Quit configuration session
4.  Configure LTS by LAN
5.  Configure LTS by Name
6.  Display, list or spool configuration
7.  Change configuration title

Enter selection:
    
```

**FIGURE 4-1**  
**CONFIG\_NTS Main Menu**

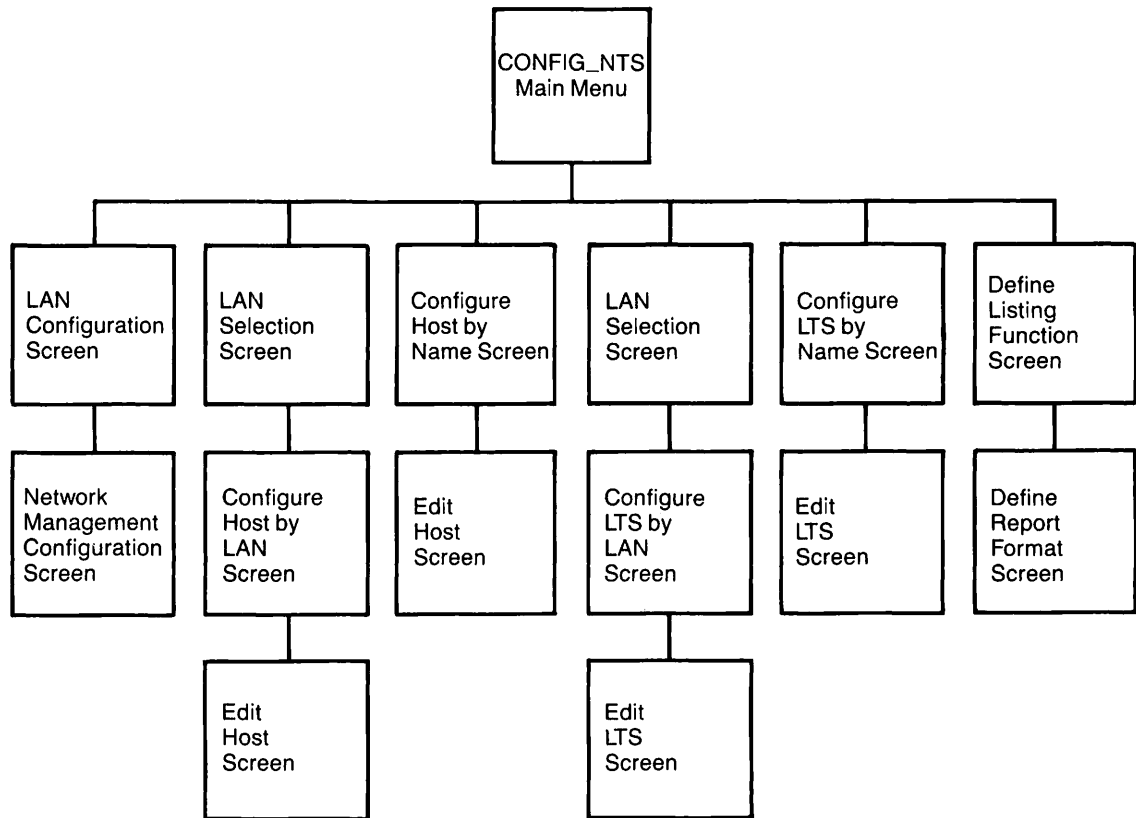
The following functions are available on this menu.

<i>Selection</i>	<i>Result</i>
<b>Configure LAN</b>	Allows you to name and configure the LAN300(s) to be included in the configuration.
<b>Configure Host by LAN</b>	Allows you to select a LAN300, and then name and configure the hosts attached to it. This option is most useful for creating a new configuration.

<i>Selection</i>	<i>Result</i>
<b>Configure Host by Name</b>	Alphabetically displays all the hosts attached to all LAN300s in the configuration, and allows you to edit their configurations. This option is most useful for editing an existing configuration.
<b>Configure LTS by LAN</b>	Allows you to select a LAN300, then name and configure all the LTS300s attached to it. This option is most useful for creating a new configuration.
<b>Configure LTS by Name</b>	Alphabetically displays all the LTS300s attached to all LAN300s in the configuration, and allows you to edit their configurations. This option is most useful for editing an existing configuration.
<b>Display, list or spool configuration</b>	Gives you the choice of displaying the configuration on your terminal's screen (display), writing it to a disk file (list), or spooling it to a printer (spool).
<b>Change configuration title</b>	Allows you to change the two 80-character lines of text that appear on the top of the Main menu and the LAN Configuration screen. This text identifies and describes the configuration file.
<b>Help</b>	Displays help information about using the program.
<b>Save current configuration</b>	Saves the configuration file on disk. Unless you select this option before leaving the program, any changes that you made since the last save operation are discarded.
<b>Quit configuration session</b>	Closes the configuration file and terminates CONFIG_NTS. If you have made changes since the last save operation, CONFIG_NTS warns you that they will be lost if you quit, and prompts you for confirmation to quit. If you want to save the changes, answer NO and select <b>Save current configuration</b> before you quit.

## CONFIG\_NTS Screen Hierarchy

CONFIG\_NTS is arranged in a hierarchy of screens, starting from the Main menu. Refer to Figure 4-2.



**FIGURE 4-2**  
CONFIG\_NTS Screen Hierarchy

## LAN300 Configuration

This section describes how to configure the LAN300(s) in your configuration. It contains this information:

- LAN Configuration Screen
- Adding a LAN300
- Deleting a LAN300
- Editing a LAN300
- Configuring Network Management Functions

The LAN300 section of your NTS configuration names and configures the LAN300s included in your configuration. Because each host can be attached to as many as six different LAN300s, it is

necessary to distinguish them with unique logical names. As many as 32 LAN300s can be included in an NTS configuration file. This information is also useful for network management because it allows each NTS network to be configured with primary and secondary downline load hosts, upline dump hosts, and event reporting hosts.

**LAN300 Names:** LAN300 names can contain a maximum of 32 characters. The first character must be a letter, but the other characters can be any combination of letters, numbers, dollar signs (\$), periods (.), or underscores (\_). CONFIG\_NTS defaults the LAN300 names to the form LAN300-*nn*, where *nn* is a number from 1 through 32.

You must use the same name for the LAN300 that is used in your PRIMENET configuration file, if you have one. Otherwise, if you attempt to start NTS while PRIMENET is already running on the LAN300, START\_NTS detects the naming inconsistency and does not start NTS. START\_NET also checks for LAN300 name consistency when you attempt to start PRIMENET on a LAN300 on which NTS is already running.

## LAN Configuration Screen

The LAN Configuration screen, illustrated in Figure 4-3, displays the LAN300s included in your configuration and provides a menu of LAN300 configuration functions. To reach this menu, select **Configure LAN** from the CONFIG\_NTS Main menu.

```
The following LANs are configured:

-> 1. LAN300-1
    LAN IN BUILDING A

    2. LAN300-2
    LAN IN BUILDING B

    3. LAN300-3
    LAN IN BUILDING C
    ADDED MARCH 1987

Enter the number of the LAN to change or delete, or:
A to add a LAN           F to finish (return to main menu)
D to delete the selected LAN S to save the current configuration
E to edit the selected LAN  Q to quit the configuration session
M for more LANs (next page)
```

**FIGURE 4-3**  
LAN Configuration Screen

Enter one of these selections:

<i>Selection number</i>	<i>Result</i>
A	Adds a LAN300 to the configuration and displays the Add LAN screen so that you can configure it.
D	Deletes the selected (marked by the arrow) LAN300 from the configuration.
E	Displays the Edit LAN screen for you to edit the selected LAN300.
M	Displays the next screen of LAN300s. Because CONFIG_NTS displays three LAN300s per screen, this selection is present only if more than three LAN300s are configured.
P	Displays the previous screen of LAN300s. This selection is present only if more than three LAN300s are configured and you are on the second (or a subsequent) screen.
F	Returns you to the Main menu.
S	Saves the configuration file on disk.
Q	Terminates CONFIG_NTS.

If more than one LAN300 is configured, you can press  to move the cursor to the next LAN300 in the configuration. This allows you to step through the entire LAN configuration by simply pressing . When you reach the end of the list, pressing  returns you to the Main menu.

## Adding a LAN300

To add a new LAN300 to your configuration:

1. Enter A at the LAN Configuration screen. CONFIG\_NTS prompts you for the name of the LAN300, suggesting a default name in the form LAN300-*nn*, where *nn* is a number from 1 through 32.
2. Enter the name of the LAN300, or press  without making an entry to accept the default name. You must use the same name that is used in your PRIMENET configuration file, if you have one. Next, CONFIG\_NTS prompts you for two lines of descriptive text.
3. Enter one or two 80-character lines of descriptive text about this LAN300. CONFIG\_NTS queries you about allowing unconfigured nodes (LTS300s) on this LAN300.
4. Enter YES or NO. In an NTS network, an unconfigured LTS300 is one that is attached to the LAN300 but not included in the configuration file. Allowing unconfigured LTS300s gives you the flexibility of adding LTS300s without modifying and redistributing the configuration file. However, such an "open" network is not as secure

as a "closed" network in which unconfigured LTS300s are not allowed. When unconfigured LTS300s are allowed, the host NTS software does not even check to see if the address of the calling LTS300 is within the range of addresses assigned to Prime LTS300s.

For a WSI300 network, answer YES, because remote systems using TCP/IP TELNET to connect to a host are regarded as "unconfigured nodes." Finally, CONFIG\_NTS displays this prompt:

Configure network management functions for this LAN?

5. Enter YES or NO. If you enter YES, CONFIG\_NTS displays the Network Management Configuration screen, described in the section entitled Configuring Network Management Functions, later in this chapter.
6. When you have finished, enter F to return to the LAN Configuration screen. Enter F again to return to the Main menu.

## Deleting a LAN300

To delete a LAN300 from your configuration, display the LAN Configuration screen (see Figure 4-3). Select the LAN300 that you want to delete by entering its selection number or by pressing  until the arrow points at it, then enter D. CONFIG\_NTS deletes the LAN300, then returns you to the LAN Configuration screen.

## Editing a LAN300

To edit the configuration of a LAN300 that has already been added to the configuration, display the LAN Configuration screen (see Figure 4-3). Select the LAN300 that you want to edit by entering its selection number or by pressing  until the arrow points at it, then enter E. CONFIG\_NTS displays the Edit LAN screen, illustrated in Figure 4-4.



```

CONFIG_NTS, revision 21.0                               Edit LAN: LAN300-2

The LAN is configured as follows:

Notes:
  LAN IN BUILDING B
  ADDED MARCH 1987

Physical LAN type: IEEE 802.3 10M 500 meter LAN
Unconfigured nodes allowed: Yes
Network management functions are not configured

Enter:
N to change the notes                                F to finish (return to prev menu)
U to toggle the Unconfigured LTS flag                 S to save the current configuration
R to rename the LAN                                  Q to quit the configuration session
M to configure ntwk mgmt functions
    
```

**FIGURE 4-4**  
**Edit LAN Screen**

The Edit LAN screen offers these selections:

<i>Selection</i>	<i>Result</i>
<b>N</b>	Allows you to change the two lines of text describing this LAN300. CONFIG_NTS prompts you for the two lines of text.
<b>U</b>	Toggles the <b>Unconfigured nodes allowed</b> prompt between Yes and No.
<b>R</b>	Allows you to rename the LAN300. CONFIG_NTS prompts you for the new name.
<b>M</b>	Displays the Network Management Configuration screen, illustrated in Figure 4-5, for you to configure the primary and secondary downline load hosts, upline dump hosts, and event reporting hosts.
<b>F</b>	Returns you to the Main menu.
<b>S</b>	Saves the configuration file on disk.
<b>Q</b>	Terminates CONFIG_NTS.

## Configuring Network Management Functions

The LAN300 Network Management Facility is a layer of software that provides service functions to the LAN300. These functions are LHC300 downline load and upline dump, LTS300 downline load and upline dump, error and event reporting, statistics gathering, status commands, and a diagnostic loopback capability.

The network management section of the LAN300 configuration indicates which hosts are to serve as **LTS300 downline load hosts**. These hosts respond to LTS300 requests for downline loads of software.

The **LTS300 upline dump hosts** receive upline dumps of LTS300 operating software. These dumps are used to analyze software failures.

The third part of LAN300 Network Management configuration is indicating which hosts should collect event and error reports sent by the LTS300s on the network. These reports document downline loads or any kind of error condition.

There can be a primary host and a secondary host for each of these functions. Configuring secondary hosts can eliminate much needless network traffic because the secondary host performs the function when the primary host is down. Do not configure network management functions for a host that is running only WSI300. For more information on LAN300 Network Management, refer to Chapter 3, Preparing to Configure an NTS Network.

There are two ways to reach the Network Management Configuration screen, which is illustrated in Figure 4-5:

- When adding a LAN300, answer YES to the **Configure network management functions for this LAN?** prompt, or
- When editing a LAN300 configuration, enter M at the Edit LAN screen (see Figure 4-4).

In either case, CONFIG\_NTS displays the Network Management Configuration screen, illustrated in Figure 4-5.

```

Network management functions for the LAN are configured as follows:

LTS Downline Load Hosts
  Primary :
  Secondary:

LTS Upline Dump Hosts
  Primary :
  Secondary:

LTS Event Reporting Hosts
  Primary :
  Secondary:

Enter:
  D to change downline load hosts   F to finish (return to prev menu)
  U to change upline dump hosts     S to save the current configuration
  E to change event reporting hosts  Q to quit the configuration session
    
```

**FIGURE 4-5**  
**Network Management Configuration Screen**

The Network Management Configuration screen shows the hosts currently configured for network management functions and offers these selections:

<i>Selection</i>	<i>Result</i>
<b>D</b>	Allows you to add or change the primary and secondary downline load hosts for the LAN300. CONFIG_NTS prompts you for the host names.
<b>U</b>	Allows you to add or change the primary and secondary upline dump hosts for the LAN300. CONFIG_NTS prompts you for the host names.
<b>E</b>	Allows you to add or change the primary and secondary event reporting hosts for the LAN300. CONFIG_NTS prompts you for the host names.
<b>F</b>	Returns you to the Main menu.
<b>S</b>	Saves the configuration file on disk.
<b>Q</b>	Terminates CONFIG_NTS.

Note that if you enter a host name that is not included in the configuration, CONFIG\_NTS displays this message and prompt:

```
HOSTX is not a configured host on LAN300-1
```

```
Do you want to override errors due to unconfigured hosts?
```

Answer YES or NO. This override is useful when you are creating a new configuration because it is natural to configure the LAN300(s) before the hosts.

## Host Configuration

This section explains how to configure the hosts connected to your LAN300 network(s). It contains this information:

- Introduction
- Configuring Hosts by LAN
- Configuring Hosts by Name

### Introduction

A host is a Prime computer connected to one or more LAN300 networks by one or more LAN Host Controller 300 (LHC300) boards. These LHC300 boards are inserted in the backplane of the host computer. Each host can have as many as six LHC300 boards, connected to the same or different LAN300s. However, only four of these boards can be running NTS; the others must be running PRIMENET or WSI300. An LHC300 can be connected to only one LAN300 at a time. Thus, each host can be connected to as many as six different LAN300 networks, but only four can be running NTS. NTS does not currently provide for internetworking between LAN300s. In other words, NTS users can communicate only with the hosts on their directly connected LAN300.

You can run PRIMENET concurrently with NTS on an LHC300 and/or a LAN300. The NTS configuration file describes only the LHC300s running NTS or WSI300; PRIMENET-related configuration information is contained in the PRIMENET configuration file created with CONFIG\_NET. For more information, see Host-Related Guidelines in Chapter 1, Planning an NTS Network.

When a host has more than one LHC300 connected to the same LAN300 network, NTS performs load balancing of incoming calls. When an LTS300 wants to connect to a host, it multicasts a connection request on the network. Each LHC300 supporting NTS for that host responds with its address and current number of NTS terminal connections. The LTS300 then chooses the LHC300 with the smallest number of NTS terminal connections.

Note that host configuration is not dynamic; that is, it does not take effect while NTS is running. Instead, you must stop each host with the `STOP_NTS` command, distribute the new configuration file, then restart each host with the `START_NTS` command.

The host configuration has two elements: host naming and LHC300 numbering and mapping.

**Host Naming:** The first step in host configuration is to assign a logical name to each host. This allows NTS users to specify host names rather than cumbersome addresses in connection requests. It also allows load balancing, because a host can be connected to a LAN300 by more than one LHC300, each of which has its own address. Thus, the user can simply use the host's logical name in connection requests, allowing NTS to transparently select the least utilized LHC300 for the connection.

Host names can contain a maximum of six characters. The first character must be a letter, but the other characters can be any combination of letters, numbers, periods (.), dollar signs (\$), and underscores (\_). Use the host name given by the `SYSNAM CONFIG` directive. Also use the same name in the `PRIMENET` configuration file, if you have one. Remember that all names in the NTS configuration file come from the same name space, and all names must be unique. This includes LAN300 names, host names, and LTS300 names.

**LHC300 Numbering and Mapping:** The second step in creating a host configuration is assigning a logical device number to each LHC300 and indicating the LAN300 to which it is connected. Each LHC300 in a host has a unique logical device number in the form `LHC0n`, where *n* is a number from 0 through 7. These logical device numbers are assigned by LHC directives in the node's `CONFIG` file. For more information on the LHC directive, see Chapter 2, *Installing NTS*.

## Configuring Hosts by LAN

Selection 2 on the `CONFIG_NTS` Main menu, **Configure Host by LAN**, displays and allows you to configure all the hosts attached to a given LAN300. This selection is most useful when you are creating a new configuration. When you make this selection, `CONFIG_NTS` displays the LAN Selection screen, illustrated in Figure 4-6. Note that if the configuration contains only one LAN300, you are taken directly to the Configure Host by LAN screen (see Figure 4-7). The LAN Selection screen allows you to select the LAN300 for which you want to configure hosts.

```
CONFIG_NTS, revision 21.0          Configure Host by LAN -- LAN selection

The following LANs are configured:

-> 1. LAN300-1
   2. LAN300-2
   3. LAN300-3

Enter the item number of the LAN on which the host will be configured, or:
                                     F to finish (return to main menu)
                                     S to save the current configuration
                                     Q to quit the configuration session
```

**FIGURE 4-6**  
**LAN Selection Screen**

Enter the item number of the LAN300 for which you want to configure hosts, or press  without making an entry to select the LAN300 marked by the arrow. CONFIG\_NTS displays and allows you to configure the hosts attached to that LAN300. When you finish configuring the hosts on that LAN300 and return to this screen, the arrow will be pointing at the next LAN300. When you have configured the last LAN300 displayed on the screen, the arrow no longer appears on the screen. Pressing  at that point displays the next screen of LANs if there is one, or returns you to the Main menu if you have reached the end of the list.

If more than three LANs are configured, you have the additional option of entering M to display the next screen of LANs, or P to display the previous screen of LANs. Otherwise, those options are not available. Entering F returns you to the Main menu.

When you select the LAN300 for which you want to configure hosts, CONFIG\_NTS displays the Configure Host by LAN screen, illustrated in Figure 4-7.

```

CONFIG_NTS, revision 21.0                Configure host on LAN: LAN300-1

LAN IN BUILDING A
ADDED MARCH 1987

The following hosts are configured on this LAN:

->  1.  EN.25                            LHC00 LHC01 LHC03
    2.  ENQ                               LHC00 LHC01

Enter the item number of the host to change, or:
  A to add a host to the LAN      F to finish (return to prev menu)
  D to delete the selected host   S to save the current configuration
  E to edit the selected host     Q to quit the configuration session
    
```

**FIGURE 4-7**  
**Configure Host by LAN Screen**

This screen offers you these selections:

<i>Selection</i>	<i>Result</i>
<b>A</b>	Allows you to add a host to the LAN300.
<b>D</b>	Deletes the selected host (the one marked by the arrow) from the configuration.
<b>E</b>	Allows you edit the configuration of the selected host.
<b>M</b>	Displays the next screen of hosts, if there is another one. This option is not present if there is only one screen of hosts.
<b>P</b>	Displays the previous screen of LAN300s. This selection is present only if more than three LAN300s are configured and you are on the second (or a subsequent) screen.
<b>F</b>	Returns you to the LAN Selection screen if more than one LAN300 is configured, or to the Main menu if there is only one LAN300 in the configuration.
<b>S</b>	Saves the configuration file on disk.
<b>Q</b>	Terminates CONFIG_NTS.

If more than one host is configured, you can press **Return** to move the cursor to the next host in the configuration. This allows you to step through the entire host configuration for the currently selected LAN300 by simply pressing **Return**. When you reach the end of the list, pressing **Return** returns you to the LAN Selection screen if more than one LAN300 is configured, or to the Main menu if only one LAN300 is configured.

**Adding a Host:** To add a host to the configuration for the selected LAN300, enter A at the Configure Host by LAN screen. CONFIG\_NTS prompts you for the name of the host, then prompts you for the LHC300s in the host that are connected to the currently selected LAN300. Enter the logical device numbers of those LHC300s, separated by blank spaces; for example: LHC01 LHC03 LHC04. Do not enter the logical device numbers of LHC300s in the host that are attached to other LAN300s. When you have supplied the necessary information, CONFIG\_NTS returns you to the Configure Host by LAN screen.

**Deleting a Host:** To delete a host from the configuration for the currently selected LAN300, enter its item number or press **Return** until the arrow points at it, then enter D. CONFIG\_NTS deletes the host, then returns you to the Configure Host by LAN screen. This does not entirely delete the host from the configuration if it is also configured on other LAN300s.

**Editing a Host:** To edit a host's configuration, enter its item number or press **Return** until the arrow points at it, then enter E. CONFIG\_NTS displays the Edit Host screen, illustrated in Figure 4-8.

```

CONFIG_NTS, revision 21.0                               Edit host: BIGBOY

The host is connected to LAN1 by the following host controllers:

    LHC00 LHC01

Enter:
    A to add an LHC                                     F to finish (return to prev menu)
    D to delete an LHC                                  S to save the current configuration
    R to rename the host                                Q to quit the configuration session
  
```

**FIGURE 4-8**  
Edit Host Screen

This screen offers you these selections:

<i>Selection</i>	<i>Result</i>
A	Allows you to add LHC300s to the host's configuration. When CONFIG_NTS prompts you for the list of LHC300s to be added, enter their logical device numbers separated by blank spaces; for example: LHC01 LHC02. LHC300 logical device numbers must be in the form LHC0 <i>n</i> , where <i>n</i> is a number from 0 through 7.



<i>Selection</i>	<i>Result</i>
<b>D</b>	Allows you to delete LHC300s from the host's configuration. When CONFIG_NTS prompts you for the list of LHC300s to be deleted, enter their logical device numbers separated by blank spaces; for example: LHC01 LHC02.
<b>R</b>	Allows you to rename the host. CONFIG_NTS prompts you for the new name.
<b>F</b>	Returns you to the Configure Host by LAN screen.
<b>S</b>	Saves the configuration file on disk.
<b>Q</b>	Terminates CONFIG_NTS.

When you have finished configuring the host, enter F to return to the Configure Host by LAN screen.

### Configuring Hosts by Name

Selection 3 from the CONFIG\_NTS Main menu, **Configure Host by Name**, displays and allows you to configure all the hosts in the configuration. The hosts are listed in alphabetical order. These hosts may be attached to any of the LAN300s in the configuration, and possibly to as many as four LAN300s. This is because each LHC300 in the host can be attached to a different LAN300. This selection is most useful for editing an existing configuration because you can edit a host's entire configuration at once, even though it may be connected to multiple LAN300s. For example, you might use this selection when adding a new LHC300 to a host. When you make this selection, CONFIG\_NTS displays the Configure Host by Name screen, illustrated in Figure 4-9.

```

CONFIG_NTS, revision 21.0                                Configure host by name

The following hosts are configured:

-> 1.  BARNEY
    2.  FRED
    3.  WILMA

Enter the item number of the host to change, or:
A to add a new host          F to finish
D to delete the selected host S to save the current configuration
E to edit the selected host  Q to quit the configuration session
    
```

**FIGURE 4-9**  
Configure Host by Name Screen

This screen displays all the hosts in the configuration in alphabetical order, regardless of the LAN300(s) to which they are attached. Otherwise, it operates in the same way as the Configure Hosts by LAN screen (see Figure 4-7), which is fully described in the section entitled Configuring Hosts by LAN in this chapter.

**Adding a Host:** To add a host to the configuration, enter A at the Configure Host by Name screen. CONFIG\_NTS prompts you for the name of the first LAN300 to which the host is connected. The LAN300 that you enter must already exist in the configuration. CONFIG\_NTS then prompts you for the host's name. Next, CONFIG\_NTS prompts you for a list of the LHC300s in the host connected to the LAN300 you just named. Enter the logical device numbers of those LHC300s, separated by blank spaces. For example: LHC01, LHC02. Finally, CONFIG\_NTS prompts you for the name of the next LAN300 to which the host is attached. Enter its name, or press  without making an entry to return to the Configure Host by Name screen. If you do enter another LAN300 name, CONFIG\_NTS repeats the prompts described above.

**Deleting a Host:** To delete a host from the configuration, enter its item number or press  until the arrow points at it, then enter D. CONFIG\_NTS deletes the host, then returns you to the Configure Host by Name screen. This deletes the host from all LAN300s on which it is configured.

**Editing a Host:** To edit a host's configuration, enter its item number or press  until the arrow points at it, then enter E. CONFIG\_NTS displays the Edit Host screen, illustrated in Figure 4-10.

```

CONFIG_NTS, revision 21.0                               Edit host: BOBO

The host is configured as follows:

    on LAN300-1:                                       LHC02
    on LAN300-2:                                       LHC00 LHC01 LHC03

Enter:
  A to add an LHC to a LAN           F to finish (return to prev menu)
  D to delete an LHC                 S to save the current configuration
  R to rename the host               Q to quit the configuration session

```

**FIGURE 4-10**  
Edit Host Screen

This screen shows the LAN300s to which this host is attached, and the LHC300s by which it is attached to those LAN300s. The screen offers you these selections:

<i>Selection</i>	<i>Result</i>
A	Allows you to add LHC300s to the host's configuration. CONFIG_NTS prompts you for the LAN300 to which the LHC300s are attached. Enter the name of the LAN300. This LAN300 must already be configured. Next, CONFIG_NTS prompts you for the list of LHC300s to be added. Enter their logical device numbers separated by blank spaces; for example: LHC01 LHC02.

<i>Selection</i>	<i>Result</i>
D	Allows you to delete LHC300s from the host's configuration. When CONFIG_NTS prompts you for the list of LHC300s to be deleted, enter their logical device numbers separated by blank spaces. For example: LHC01 LHC02.
R	Allows you to rename the host.
F	Returns you to the Configure Host by Name screen.
S	Saves the configuration file on disk.
Q	Terminates CONFIG_NTS.

When you have finished configuring the host, enter F to return to the Configure Host by Name screen.

## LTS300 Configuration

This section explains how to configure the LTS300s attached to your NTS network(s). It contains this information:

- Introduction
- LTS300 Line Configuration
- Configuring LTS300s by LAN
- Configuring LTS300s by Name

### Introduction

A LAN Terminal Server 300 (LTS300) is a microprocessor-based terminal server that supports a cluster of eight asynchronous terminals, serial printers, or other asynchronous devices. An LTS300 may be directly connected to a transceiver or cascaded from another LTS300. Cascaded LTS300s are cabled to each other rather than directly to a transceiver; as many as four LTS300s can be cascaded together, thereby sharing the same transceiver.

LTS300 configuration consists of assigning a logical name to each LTS300 on your LAN300s, indicating to which LAN300 the LTS300 is attached, and giving its address. This naming allows you to use logical names rather than cumbersome addresses in commands such as LIST\_LTS\_STATUS. An LTS300 can be attached to only one LAN300 at a time.

Note that LTS300 configuration changes take effect dynamically when you save the configuration, provided that you are at the supervisor terminal or are included in the network management ACL group (.NETWORK\_MGT\$). In other words, CONFIG\_NTS automatically updates the LTS300 portion of the NTS online database when you save the configuration. (Before non-LTS300 configuration changes take effect, the operator must stop each Prime host on the network with the STOP\_NTS command, distribute the new configuration file, then restart each host with the START\_NTS command.)

An LTS300 configuration has two elements: the LTS300's logical name and its address.

**LTS300 Logical Names:** LTS300 logical names can be a maximum of 16 characters. The first character must be a letter, but the other characters can be any combination of letters, numbers, dollar signs (\$), periods (.), or underscores (\_). In addition, CONFIG\_NTS checks that LTS300 logical names are unique among all the names in the entire configuration, including LAN300 names, host names, and LTS300 names. It is not sufficient that they be unique only among the LTS300s attached to their LAN300. This global uniqueness allows you to use commands such as LIST\_LTS\_STATUS without using a -ON LAN option to specify the LAN300 to which the LTS300 is attached.

**Addresses:** The LTS300 configuration serves to associate a logical name with an LTS300's address. The address of an LTS300 cannot be altered, because it is burned into the LTS300 PROM during manufacturing and marked on a tag attached to the LTS300. All you need to do is to copy the address from the tag and enter it into the NTS configuration file.

## LTS300 Line Configuration

Each LTS300 has eight lines to which you can attach terminals or other asynchronous devices. You do not set LTS300 line parameters with CONFIG\_NTS. Instead, NTS terminal users set their own line parameters with LTS300 user commands such as SET and PORT. For more information, refer to the *NTS User's Guide*. In addition, NTS users, system operators, and administrators can change NTS line parameters using the PRIMOS command, SET\_ASYNC. For more information, refer to the *System Administrator's Guide, Volume II: Communication Lines and Controllers*. For NTS assigned lines and login lines, the line parameters are often set by the host application being used.

## Configuring LTS300s by LAN

Selection 4 from the CONFIG\_NTS Main menu, **Configure LTS by LAN**, allows you to configure the LTS300s attached to each LAN300 in your configuration. This selection is most useful when you are creating a new configuration. When you make this selection, CONFIG\_NTS displays the LAN Selection screen, illustrated in Figure 4-11. This screen allows you to choose the LAN300 for which you want to configure LTS300s.

```

CONFIG_NTS, revision 21.0          Configure LTS by LAN -- LAN selection

The following LANs are configured:

-> 1. LAN300-1
   2. LAN300-2
   3. LAN300-3
   4. LAN300-4
   5. LAN300-5

Enter the item number of the LAN on which the LTS will be configured, or:
                                     F to finish (return to main menu)
                                     S to save the current configuration
                                     Q to quit the configuration session
    
```

**FIGURE 4-11  
LAN Selection Screen**

Enter the item number of the LAN300 for which you want to configure LTS300s, or press  without making an entry to select the LAN300 marked by the arrow. CONFIG\_NTS displays and allows you to configure the LTS300s attached to that LAN300 (see Figure 4-12). When you finish configuring the LTS300s on that LAN300 and return to this screen, the arrow will be pointing at the next LAN300. When you have configured the last LAN300 displayed on the screen, the arrow no longer appears on the screen. Pressing  at that point displays the next screen of LANs if there is one, or returns you to the Main menu if you have reached the end of the list.

If more than three LANs are configured, you have the additional option of entering M to display the next screen of LANs, or P to display the previous screen of LANs. Otherwise, these options are not available. Entering F returns you to the Main menu.

When you select the LAN300 for which you want to configure LTS300s, CONFIG\_NTS displays the Configure LTS by LAN screen, illustrated in Figure 4-12.

```

CONFIG_NTS, revision 21.0                Configuring LTS on LAN: LAN300-1

LAN IN BUILDING A
ADDED MARCH 1987

The following LTSs are configured on this LAN:

->  1.  LTS1                08-00-2F-00-00-01
    2.  LTS2                08-00-2F-00-00-03
    3.  LTS3                08-00-2F-00-00-04
    4.  LTS4                08-00-2F-00-00-06
    5.  LTS5                08-00-2F-00-00-07
    6.  LTS6                08-00-2F-00-00-05
    7.  LTS7                08-00-2F-00-00-02

Enter the item number of the LTS to change, or:
A to add an LTS to the LAN      F to finish (return to prev menu)
D to delete the selected LTS    S to save the current configuration
E to edit the selected LTS      Q to quit the configuration session

```

**FIGURE 4-12**  
Configure LTS by LAN Screen

This screen offers you these selections:

<i>Selection</i>	<i>Result</i>
A	Allows you to add an LTS300 to the LAN.
D	Deletes the currently selected LTS300 (the one marked by the arrow) from the configuration.
E	Allows you to edit the configuration of the currently selected LAN300 (the one marked by the arrow).
F	Returns you to the previous screen.
S	Saves the configuration file on disk. Provided that you are at the supervisor terminal or are included in the network management ACL group (.NETWORK_MGT\$), LTS300 configuration changes take effect dynamically. That is, CONFIG_NTS automatically updates the LTS300 portion of the NTS online database.
Q	Terminates CONFIG_NTS.

If more than one LTS300 is configured, you can press  to move the cursor to the next LTS300 in the configuration. This allows you to step through the entire LTS300 configuration for the currently selected LAN300 by simply pressing . When you reach the end of the list,

pressing  returns you to the LAN Selection screen if more than one LAN300 is configured, or to the Main menu if only one LAN300 is configured.

**Adding an LTS300:** To add an LTS300 to the configuration for the selected LAN300, enter A at the Configure LTS by LAN screen. CONFIG\_NTS prompts you for the name of the LTS300. Enter a unique name that contains a maximum of 16 characters, beginning with a letter and containing only letters, numbers, dollar signs (\$), periods (.), and underscores (\_). Next CONFIG\_NTS displays this prompt:

Enter LTS address (nn-nn-nn): 08-00-2F-

Enter the last six digits of the LTS300's address in the format *nn-nn-nn*. The address is printed on a tag attached to the LTS300. Note that the first six digits (08-00-2F-) are displayed by CONFIG\_NTS because they cannot be changed; they are the reserved range of addresses for Prime LTS300s. When you have entered the address, CONFIG\_NTS returns you to the Configure LTS by LAN screen.

**Deleting an LTS300:** To delete an LTS300 from the configuration, enter its item number or press  until the arrow points at it, then enter D. CONFIG\_NTS deletes the LTS300, then returns you to the Configure LTS by LAN screen.

**Editing an LTS300:** To edit an LTS300's configuration, enter its item number or press  until the arrow points at it, then enter E. CONFIG\_NTS displays the Edit LTS screen, illustrated in Figure 4-13.

```

CONFIG_NTS, revision 21.0                               Edit LTS: NEWBOY

The LTS is configured as follows:

LAN:      LAN300-1

Address:  08-00-2F-0F-00-07

Enter:
A to change the LTS address      F to finish (return to prev menu)
M to move this LTS to another LAN S to save the current configuration
R to rename the LTS              Q to quit the configuration session
    
```

**FIGURE 4-13**  
Edit LTS Screen

This screen shows the LAN300 to which this LTS300 is attached, along with its address. This screen offers you these selections:

<i>Selection</i>	<i>Result</i>
A	Allows you to change the address of the LTS300. CONFIG_NTS prompts you for the new address. Normally you need to change the address only when replacing a defective LTS300 or to correct an earlier configuration error, because LTS300 addresses are set at the factory and cannot be changed.
M	Allows you to "move" the LTS300 to a different LAN300; or in other words, to change the LAN300 to which it is attached. CONFIG_NTS prompts you for the name of the new LAN300.
R	Allows you to rename the LTS300. CONFIG_NTS prompts you for the new name. Enter a unique name that contains a maximum of 16 characters. The first character must be a letter, but the others can be any combination of letters, numbers, dollar signs (\$), periods (.), or underscores (_).
F	Returns you to the Configure LTS by LAN screen.
S	Saves the configuration file on disk. Provided that you are at the supervisor terminal or are included in the network management ACL group (.NETWORK_MGT\$), LTS300 configuration changes take effect dynamically. That is, CONFIG_NTS automatically updates the LTS300 portion of the NTS online database.
Q	Terminates CONFIG_NTS.

When you have finished editing the LTS300 configuration, enter F to return to the Configure LTS by LAN screen.

## Configuring LTS300s by Name

Selection 5 from the CONFIG\_NTS Main menu, **Configure LTS by Name**, alphabetically lists and allows you to configure all the LTS300s in the configuration. The LTS300s may be attached to any of the LAN300s in the configuration. This selection is most useful for editing an existing configuration. When you make this selection, CONFIG\_NTS displays the Configure LTS by Name screen, illustrated in Figure 4-14.



```

CONFIG_NTS, revision 21.0                                Configure LTS by name

The following LTSs are configured:

->  1. FREDDY                                           08-00-2F-00-0F-0E
                                           on LAN300-1
    2. LTS1                                             08-00-2F-0F-0F-0F
                                           on LAN300-1
    3. LTS2                                             08-00-2F-00-00-01
                                           on LAN300-1
    4. LTS3                                             08-00-2F-00-00-02
                                           on LAN300-1
    5. NEWBOY                                           08-00-2F-00-00-03
                                           on LAN300-1

Enter the item number of the LTS to change, or:
  A to add an LTS           F to finish (return to prev menu)
  D to delete the selected LTS  S to save the current configuration
  E to edit the selected LTS   Q to quit the configuration session
  M for more LTSs (next page)
    
```

**FIGURE 4-14**  
**Configure LTS by Name Screen**

This screen displays all the LTS300s in the configuration, along with their addresses and the LAN300 to which they are attached. Otherwise, it operates in the same way as the Configure Host by LAN screen (Figure 4-12), which is described in the section entitled Configuring LTS300s by LAN in this chapter.

**Adding an LTS300:** To add an LTS300 to the configuration, enter A at the Configure LTS by Name screen (see Figure 4-14). CONFIG\_NTS prompts you for the LTS300 name. Enter a unique name that contains a maximum of 16 characters, beginning with a letter and containing only letters, numbers, dollar signs (\$), periods (.), and underscores (\_). Next CONFIG\_NTS displays this prompt:

Enter LTS address (nn-nn-nn): 08-00-2F-

Enter the last six digits of the LTS300's address in the format *nn-nn-nn*. The address is printed on a tag attached to the LTS300. Note that the first six digits (08-00-2F-) cannot be changed; they are the reserved range of addresses for Prime LTS300s. When you have entered the address, CONFIG\_NTS returns you to the Configure LTS by Name screen.

**Deleting an LTS300:** To delete an LTS300 from the configuration, enter its item number or press  until the arrow points at it, then enter D. CONFIG\_NTS deletes the LTS300, then returns you to the Configure LTS by Name screen.

**Editing an LTS300:** To edit an LTS300's configuration, enter its item number or press  until the arrow points at it, then enter E. CONFIG\_NTS displays the Edit LTS screen, illustrated in Figure 4-15.

```

CONFIG_NTS, revision 21.0                               Edit LTS: NEWBOY

The LTS is configured as follows:

  LAN:      LAN300-3

  Address:  08-00-2F-0F-00-07

Enter:
  A to change the LTS address           F to finish (return to prev menu)
  M to move this LTS to another LAN     S to save the current configuration
  R to rename the LTS                   Q to quit the configuration session

```

**FIGURE 4-15**  
Edit LTS Screen

This screen offers you these selections:

<i>Selection</i>	<i>Result</i>
<b>A</b>	Allows you to change the LTS300's address. CONFIG_NTS prompts you for the new address. Normally you need to change the address only when replacing a defective LTS300 or to correct an earlier configuration error, because LTS300 addresses are set at the factory and cannot be changed.
<b>M</b>	Allows you to "move" the LTS300 to a different LAN300; or in other words, to change the LAN300 to which it is attached. CONFIG_NTS prompts you for the name of the new LAN300.
<b>R</b>	Allows you to rename the LTS300. CONFIG_NTS prompts you for the new name. Enter a unique name that contains a maximum of 16 characters. The first character must be a letter, but the others can be any combination of letters, numbers, dollar signs (\$), periods (.), or underscores (_).
<b>F</b>	Returns you to the Configure LTS by Name screen.
<b>S</b>	Saves the configuration file on disk. Provided that you are at the supervisor terminal or are included in the network management ACL group (.NETWORK_MGT\$), LTS300 configuration changes take effect dynamically. That is, CONFIG_NTS automatically updates the LTS300 portion of the NTS online database.
<b>Q</b>	Terminates CONFIG_NTS.

When you have finished editing the LTS300 configuration, enter F to return to the Configure LTS by Name screen.

## Saving a Configuration

Selection S on the CONFIG\_NTS Main menu, **Save current configuration**, saves the configuration file on disk. The S selections on the other menus also perform the same function. Unless you save the configuration on disk before quitting from CONFIG\_NTS, any changes you made are discarded. Thus, it is wise to perform the save operation frequently to protect your work in case of system crash or terminal hangup.

During the save operation, CONFIG\_NTS checks the configuration file for inconsistencies, such as network management functions configured for a host that is not included in the configuration. CONFIG\_NTS informs you when it finds an inconsistency. You can then abort the save operation to correct the fault, or continue to collect all the inconsistencies. In either case, you are returned to the Main menu so that you can make the corrections.

Provided that you are at the supervisor terminal or are included in the network management ACL group (.NETWORK\_MGT\$), LTS300 configuration changes take effect dynamically when you save the configuration. That is, CONFIG\_NTS automatically updates the LTS300 portion of the NTS online database and displays this message:

```
Configuration saved; active configuration updated.
```

During the save operation, CONFIG\_NTS adds this information to the configuration file:

- NTS configuration file identification

This information is a character string and a simple checksum that serve to identify the file as an NTS configuration file. Both CONFIG\_NTS and START\_NTS check this information before using an NTS configuration file and reject files that do not have it.

- File format revision level

The file format revision level identifies the software release for which the configuration file was created. This will be used if future software releases require older configuration files to be converted (updated) before they are used.

- Creation date and time stamps

The creation date and time stamps document the date and time when the file was created. They also show the name of the administrator who created the file. CONFIG\_NTS displays these stamps when you begin to edit the file and in listings of the file.

- Last edit date and time stamps

These stamps show the time and date when the file was last edited, along with the name of the administrator who performed the edit. CONFIG\_NTS displays this information when you begin to edit the file and in listings of the file.

## Displaying, Listing, or Spooling a Configuration

Selection 6 on the CONFIG\_NTS Main menu, **Display, list or spool** configuration, allows you to display the configuration file on your terminal, write it to a disk file, or spool it to a printer. (The `-DISPLAY`, `-LISTING`, and `-SPOOL` command line options, described in the section entitled Invoking CONFIG\_NTS earlier in this chapter, serve the same functions.) Although NTS configuration files are segment directories, this selection presents them in a readable format. When you make this selection, CONFIG\_NTS displays the Display Listing Function screen, illustrated in Figure 4-16. Use this screen to choose the type of listing you want.

```

Define listing function

Enter:
  D to display at terminal   F to finish (return to main menu)
  L to list to a disk file  S to save the current configuration
  P to spool with options   Q to quit the configuration session

```

**FIGURE 4-16**  
Define Listing Function Screen

This screen offers you the following selections:

<i>Selection</i>	<i>Function</i>
D	Displays the configuration file on your terminal in 23-line segments followed by a <code>--More--</code> prompt. Press <code>Return</code> to view the next screen of the configuration, or enter N or Q to terminate the display.
L	Writes the configuration file into a readable text file on disk. CONFIG_NTS prompts you to name this file. The default name for this file is the name of the configuration file with the <code>.CONFIG</code> suffix (if any) removed and the <code>.LIST</code> suffix appended.
P	Sends the configuration file to the spool queue for printing. CONFIG_NTS prompts you for options, then passes on these options as keywords and parameters to the <code>SPOOL</code> command. The configuration file is broken up into 54-line segments to correspond to the usual page size.

The remainder of the selections are the same as for the other screens in the program.

No matter which listing function you choose (display, list, or spool), CONFIG\_NTS prompts you for the report format, as illustrated in Figure 4-17.

```

Define report format: DISPLAY

Enter a report format or other option from the list below:
  L to organize by LAN           F to finish (return to prev menu)
  N to alphabetize all elements by name  S to save the current configuration
                                       Q to quit the configuration session
    
```

**FIGURE 4-17**  
**Define Report Format Screen**

This screen offers you the following selections:

<i>Selection</i>	<i>Function</i>
<b>L</b>	Organizes the display by LAN, with sections for all the hosts and LTS300s connected to each LAN.
<b>N</b>	Alphabetically lists all elements of the configuration, including LAN300s, hosts, and LTS300s.

The remainder of the selections are the same as for the other screens in the program.

### Listing Organized by LAN

This section contains an example of a listing organized by LAN. There is a separate section for each LAN, with subsections for the hosts and LTS300s attached to the LAN.

```

CONFIG_NTS Revision 21.0           Dump of configuration file:
                                   NTS*>NTS.CONFIG
    
```

```

CONFIGURATION FOR LAN300-1
BACKUP IN BACKUP>NTS
    
```

```

File created on 17 Mar 87 at 18:32 by COMMUNADMIN
    
```

```

- - - LAN: LAN300-1 - - -
LAN IN BUILDING A
ADDED MARCH 1987
    
```

Physical LAN type: IEEE 802.3 10M 500 meter LAN  
Unconfigured nodes are permitted.

Network management functions:

	Primary	Secondary
LTS Downline Load	ENR	ENS
LTS Upline Dump	ENR	ENS
LTS Event Reporting	ENR	ENS

Host name	LHCs
-----	-----
ENR	LHC00 LHC01 LHC02 LHC07
ENS	LHC00
EN.P1	LHC00

LTS name	Address
-----	-----
LTS1	08-00-2F-00-00-00
LTS2	08-00-2F-00-00-01
LTS3	08-00-2F-00-00-03
LTS4	08-00-2F-00-00-05
LTS5	08-00-2F-00-00-04

## Alphabetically Organized Listing

This section contains an alphabetically organized listing of a configuration file. In this type of listing, all the elements of the configuration file are listed alphabetically. These elements include LAN300s, hosts, and LTS300s.

CONFIG\_NTS Revision 21.0

Dump of configuration file:  
NTS\*>NTS.CONFIG

CONFIGURATION FOR LAN300-1  
BACKUP IN BACKUP>NTS

File created on 17 Mar 87 at 18:32 by COMMUNADMIN

- - - Alphabetized Listing of Configuration Elements - - -

Name	Description
-----	-----
EN.P1	Host on LAN LAN300-1: LHC00
ENR	Host on LAN LAN300-1: LHC00 LHC01 LHC02 LHC07
ENS	Host on LAN LAN300-1: LHC00

LAN300-1	LAN	(IEEE 802.3 10M 500 meter LAN)
LTS1	LTS	on LAN LAN300-1 (08-00-2F-00-00-00)
LTS2	LTS	on LAN LAN300-1 (08-00-2F-00-00-01)
LTS3	LTS	on LAN LAN300-1 (08-00-2F-00-00-03)
LTS4	LTS	on LAN LAN300-1 (08-00-2F-00-00-04)
LTS5	LTS	on LAN LAN300-1 (08-00-2F-00-00-05)

## Terminating CONFIG\_NTS

Selection Q on the CONFIG\_NTS Main menu, **Quit configuration session**, terminates CONFIG\_NTS. Before exiting, the program prompts you for confirmation. Note that any changes that you made since the last save operation are discarded when you leave the program. If you want to save your work, enter S, **Save current configuration**, before terminating CONFIG\_NTS.

---

# 5

## Sample NTS Configurations

This chapter presents two sample NTS configurations and shows how to create them with CONFIG\_NTS. It contains this information:

- Example One: Creating a New NTS Configuration
- Example Two: Editing an Existing NTS Configuration

The left-hand pages in this chapter show the actual CONFIG\_NTS menu editing and dialog used to create or edit the configurations; the right-hand pages contain diagrams of the configurations and dialog notes.

This chapter assumes that you have read Chapter 3, Preparing to Configure an NTS Network, and Chapter 4, Configuring an NTS Network.



## Example One: Creating a New NTS Configuration

In this example, we use CONFIG\_NTS to configure LAN300-1, which is illustrated in Figure 5-1. LAN300-1 contains two hosts, HostA and HostB. HostB performs all network management functions. The hosts contain these LAN Host Controller 300s (LHC300s):

- HostA: LHC01
- HostB: LHC01 and LHC02

In addition, LAN300-1 contains four LAN Terminal Server 300s, with these names and addresses:

- LTS1 08-00-2F-01-23-45
- LTS2 08-00-2F-01-23-46
- LTS3 08-00-2F-01-23-47
- LTS4 08-00-2F-01-23-48

The following is the CONFIG\_NTS menu editing and dialog used to create the configuration for LAN300-1.

Dialog Notes

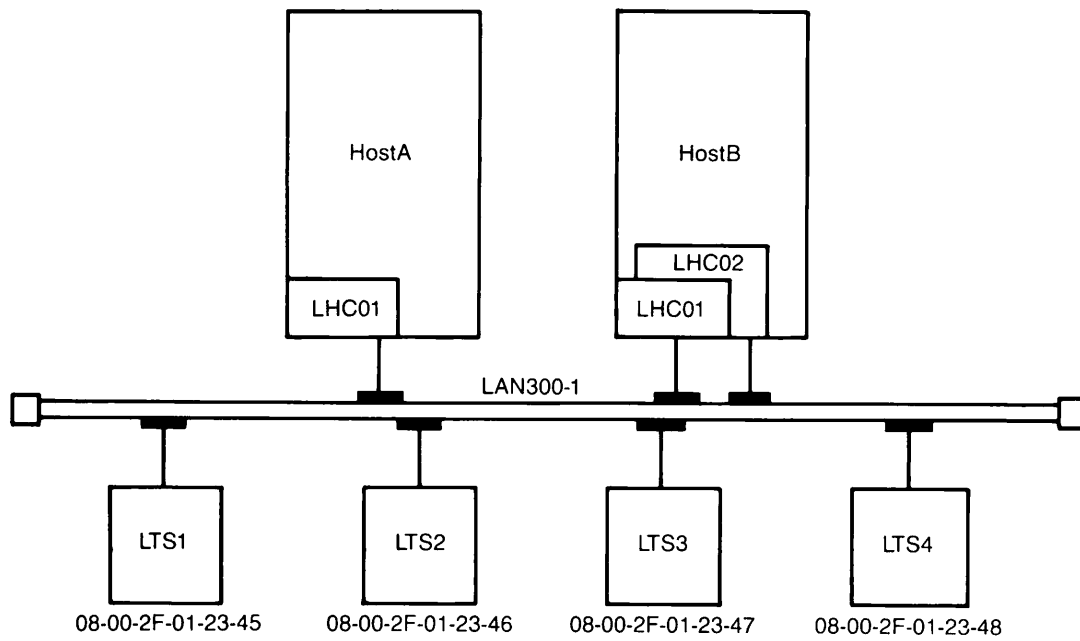


FIGURE 5-1. LAN300-1 Configuration

① OK, **CONFIG NTS -TTP TTY**  
[CONFIG\_NTS Rev. 20.2.NTS Copyright (c) 1986, Prime Computer, Inc.]

Define configuration file

② Enter the NTS configuration file name: [NTS\*>NTS.CONFIG] <RETURN>  
The configuration file doesn't exist; OK to create it? **YES**  
Enter 1 or 2 lines of (optional) text to describe this configuration:

③ { **NTS.CONFIG IS FOR LAN300-1, WHICH CONTAINS HOSTS A AND  
B, AND LTS1 THROUGH LTS4**

Create configuration file: NTS\*>NTS.CONFIG

NTS.CONFIG IS FOR LAN300-1, WHICH CONTAINS HOSTS A AND  
B, AND LTS1 THROUGH LTS4

- |   |                               |
|---|-------------------------------|
| 1. Configure LAN                        | H. Help                       |
| 2. Configure Host by LAN                | S. Save current configuration |
| 3. Configure Host by Name               | Q. Quit configuration session |
| 4. Configure LTS by LAN                 |                               |
| 5. Configure LTS by Name                |                               |
| 6. Display, list or spool configuration |                               |
| 7. Change configuration title           |                               |

④ Enter selection: **1**

Configuration file: NTS\*>NTS.CONFIG

NTS.CONFIG IS FOR LAN300-1, WHICH CONTAINS HOSTS A AND  
B, AND LTS1 THROUGH LTS4

No lans are configured.

Enter:

- |                |                                   |
|----------------|-----------------------------------|
| A to add a LAN | F to finish (return to main menu) |
|                | S to save current configuration   |
|                | Q to quit configuration session   |

⑤ Enter selection: [F] **A**

Add LAN

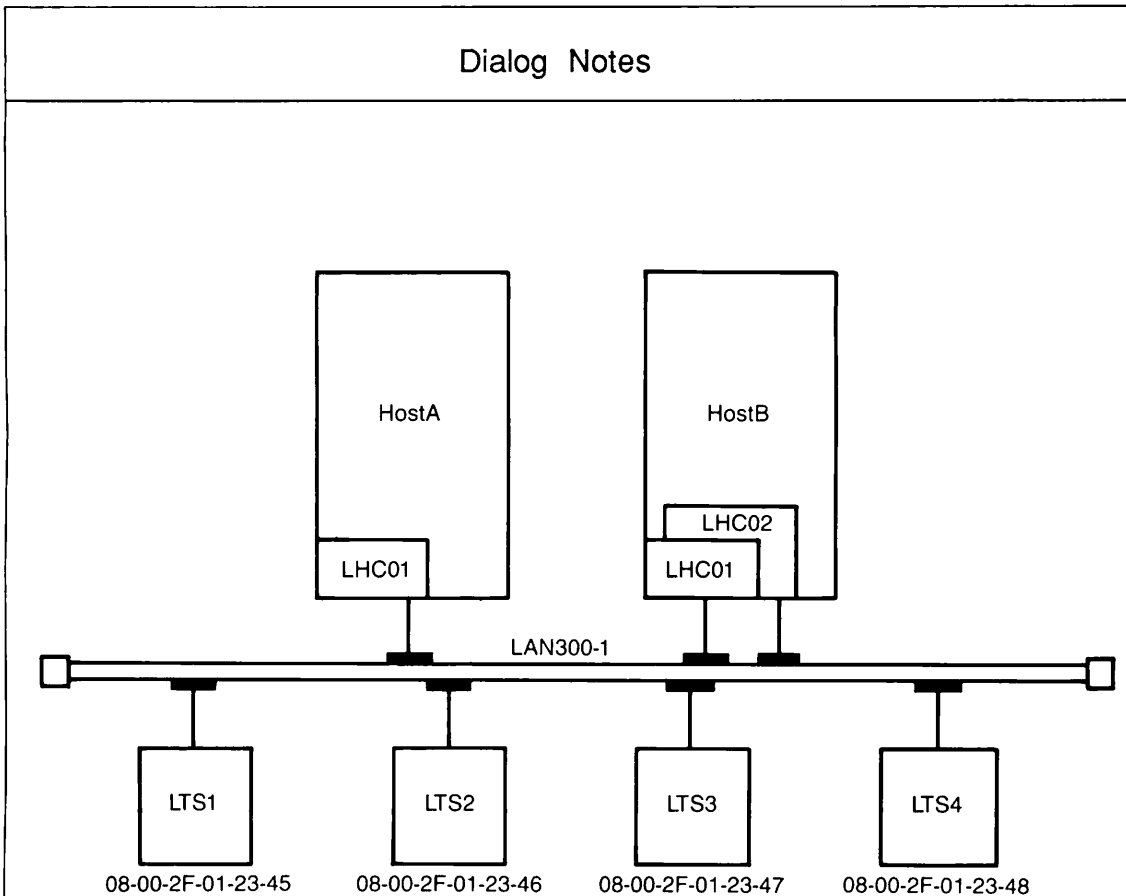
Enter LAN name: [LAN300-1] <RETURN>

Enter 1 or 2 lines of (optional) text to describe this LAN:

⑥ **LAN300-1 CONTAINS HOSTA AND HOSTB. HOSTB PERFORMS NETWORK MANAGEMENT.**

⑦ Allow unconfigured nodes on this LAN? **NO**

Configure network management functions for this LAN? **YES**



*FIGURE 5-1. LAN300-1 Configuration*

- ① Invoke the program, specifying TTY as the terminal type. This puts CONFIG\_NTS in scrolling mode.
- ② Accept the default file name, NTS.CONFIG, by pressing .
- ③ Enter a two-line description of the configuration file.
- ④ Configure the LAN300 first.
- ⑤ Add the LAN300.
- ⑥ Enter a short description of the LAN300.
- ⑦ Hosts on this LAN300 will not accept calls from LTS300s that are not included in the configuration file. Enter YES at this prompt if you plan to use Work Station Interconnect 300 (WSI300) on your network.

LAN: LAN300-1

Network management functions for the LAN are configured as follows:

LTS Downline Load Hosts

Primary :  
Secondary:

LTS Upline Dump Hosts

Primary :  
Secondary:

LTS Event Reporting Hosts

Primary :  
Secondary:

Enter:

D to change downline load hosts    F to finish (return to prev menu)  
U to change upline dump hosts      S to save the current configuration  
E to change event reporting hosts   Q to quit the configuration session

8 { Enter selection: [F] **D**  
Enter LTS downline load primary host name: **HOSTB**

HOSTB is not a configured host on LAN LAN300-1.

9 Do you want to override errors due to unconfigured hosts? **YES**

Enter LTS downline load secondary host name: **<RETURN>**

LAN: LAN300-1

Network management functions for the LAN are configured as follows:

LTS Downline Load Hosts

Primary : HOSTB  
Secondary:

LTS Upline Dump Hosts

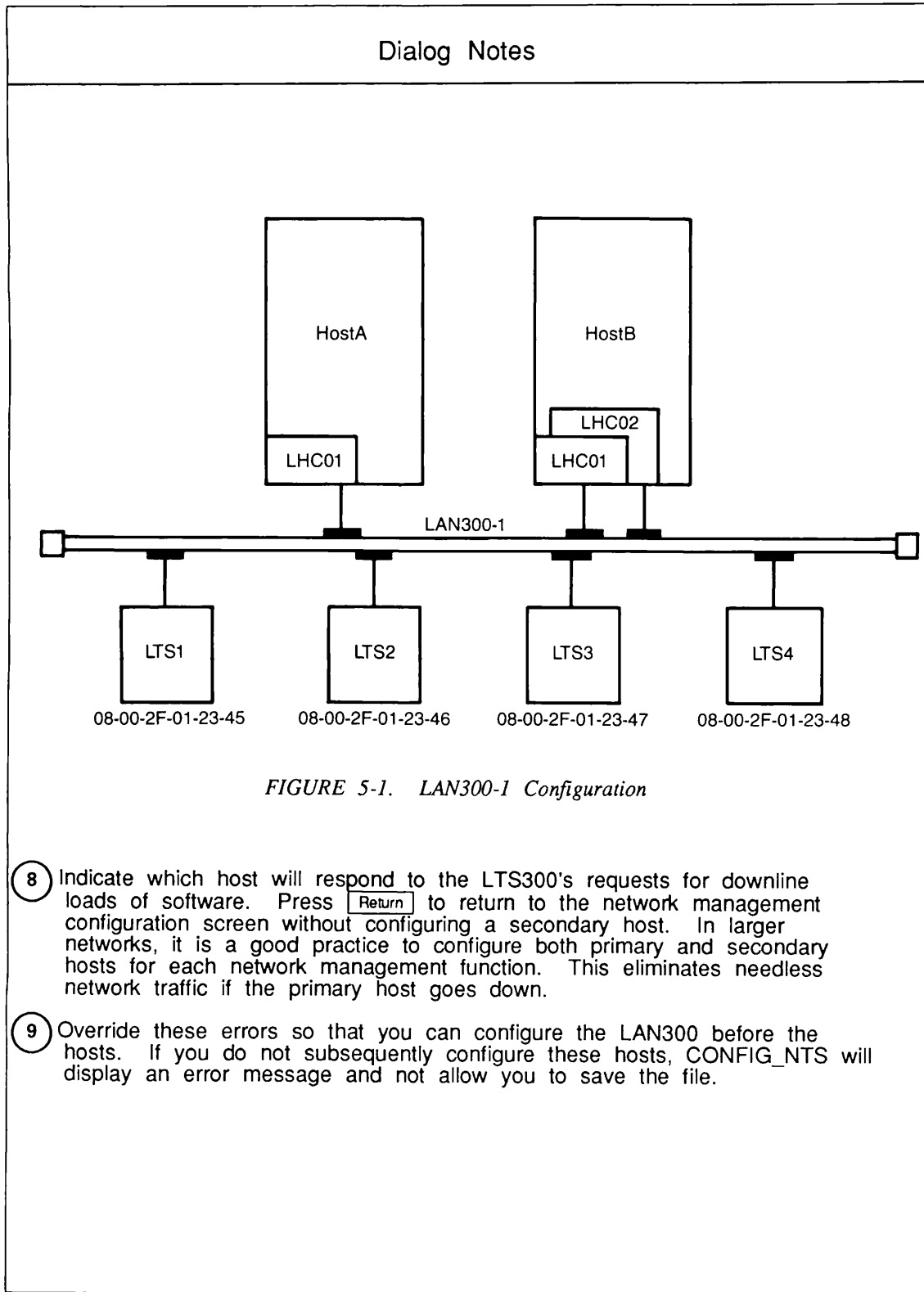
Primary :  
Secondary:

LTS Event Reporting Hosts

Primary :  
Secondary:

Enter:

D to change downline load hosts    F to finish (return to prev menu)  
U to change upline dump hosts      S to save the current configuration  
E to change event reporting hosts   Q to quit the configuration session  
Enter selection: [F] **U**



⑩ { Enter LTS upline dump primary host name: *HOSTB*  
Warning: *HOSTB* is not a configured host on LAN LAN300-1.  
Enter LTS upline dump secondary host name: *<RETURN>*

LAN: LAN300-1

Network management functions for the LAN are configured as follows:

LTS Downline Load Hosts

Primary : *HOSTB*  
Secondary:

LTS Upline Dump Hosts

Primary : *HOSTB*  
Secondary:

LTS Event Reporting Hosts

Primary :  
Secondary:

Enter:

D to change downline load hosts F to finish (return to prev menu)

U to change upline dump hosts S to save the current configuration

E to change event reporting hosts Q to quit the configuration session

Enter selection: [F] *E*

⑪ { Enter LTS event reporting primary host name: *HOSTB*  
Warning: *HOSTB* is not a configured host on LAN LAN300-1.  
Enter LTS event reporting secondary host name: *<RETURN>*

Dialog Notes

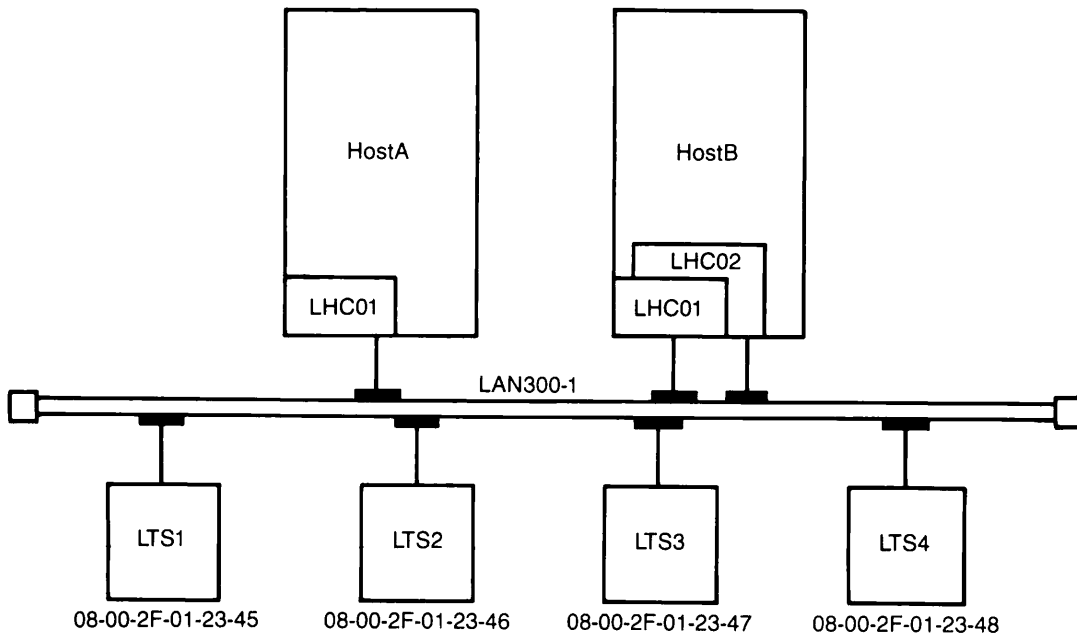


FIGURE 5-1. LAN300-1 Configuration

- ⑩ Indicate which host will receive upline dumps of LTS300 software.
- ⑪ Indicate which host will log LTS300 event and error messages.



LAN: LAN300-1

Network management functions for the LAN are configured as follows:

LTS Downline Load Hosts

Primary : HOSTB

Secondary:

LTS Upline Dump Hosts

Primary : HOSTB

Secondary:

LTS Event Reporting Hosts

Primary : HOSTB

Secondary:

Enter:

D to change downline load hosts F to finish (return to prev menu)

U to change upline dump hosts S to save the current configuration

E to change event reporting hosts Q to quit the configuration session

Enter selection: @

12

Create configuration file: NTS\*>NTS.CONFIG

NTS.CONFIG IS FOR LAN300-1, WHICH CONTAINS HOSTS A AND B, AND LTS1 THROUGH LTS4

- |   |                               |
|---|-------------------------------|
| 1. Configure LAN                        | H. Help                       |
| 2. Configure Host by LAN                | S. Save current configuration |
| 3. Configure Host by Name               | Q. Quit configuration session |
| 4. Configure LTS by LAN                 |                               |
| 5. Configure LTS by Name                |                               |
| 6. Display, list or spool configuration |                               |
| 7. Change configuration title           |                               |

13

Enter selection: 2

Configure host on LAN: LAN300-1

LAN300-1 CONTAINS HOSTA AND HOSTB. HOSTB PERFORMS NETWORK MANAGEMENT.

No hosts are configured on this LAN.

Enter:

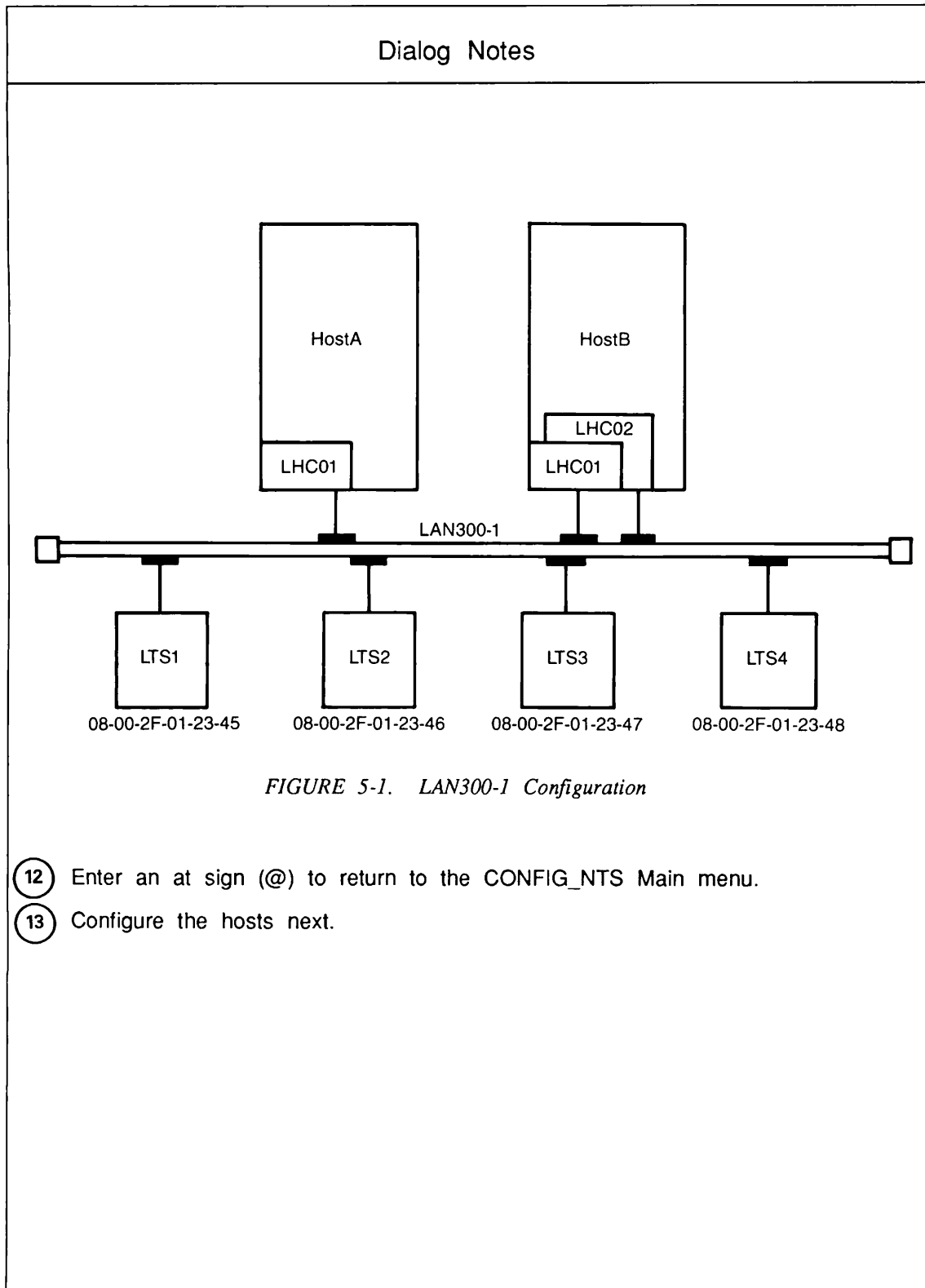
A to add a host to the LAN

F to finish (return to prev menu)

S to save the current configuration

Q to quit the configuration session

Enter selection: [F] A



14

```
Add host to LAN: LAN300-1

Enter host name: HOSTA
Enter the (blank separated) list of LHCs that will be connected to this
LAN: LHC01

Configure host on LAN: LAN300-1

LAN300-1 CONTAINS HOSTA AND HOSTB. HOSTB PERFORMS NETWORK MANAGEMENT.

The following hosts are configured on this LAN:

-> 1.  HOSTA                               LHC01

Enter the item number of the host to change, or:
  A to add a host to the LAN             F to finish (return to prev menu)
  D to delete the selected host          S to save the current configuration
  E to edit the selected host            Q to quit the configuration session
Enter selection: [F] A

Add host to LAN: LAN300-1

Enter host name: HOSTB
Enter the (blank separated) list of LHCs that will be connected to this
LAN:
LHC01 LHC02
```

```
Configure host on LAN: LAN300-1

LAN300-1 CONTAINS HOSTA AND HOSTB. HOSTB PERFORMS NETWORK MANAGEMENT.

The following hosts are configured on this LAN:

-> 1.  HOSTA                               LHC01
    2.  HOSTB                               LHC01 LHC02

Enter the item number of the host to change, or:
  A to add a host to the LAN             F to finish (return to prev menu)
  D to delete the selected host          S to save the current configuration
  E to edit the selected host            Q to quit the configuration session
Enter selection: [2] @
```

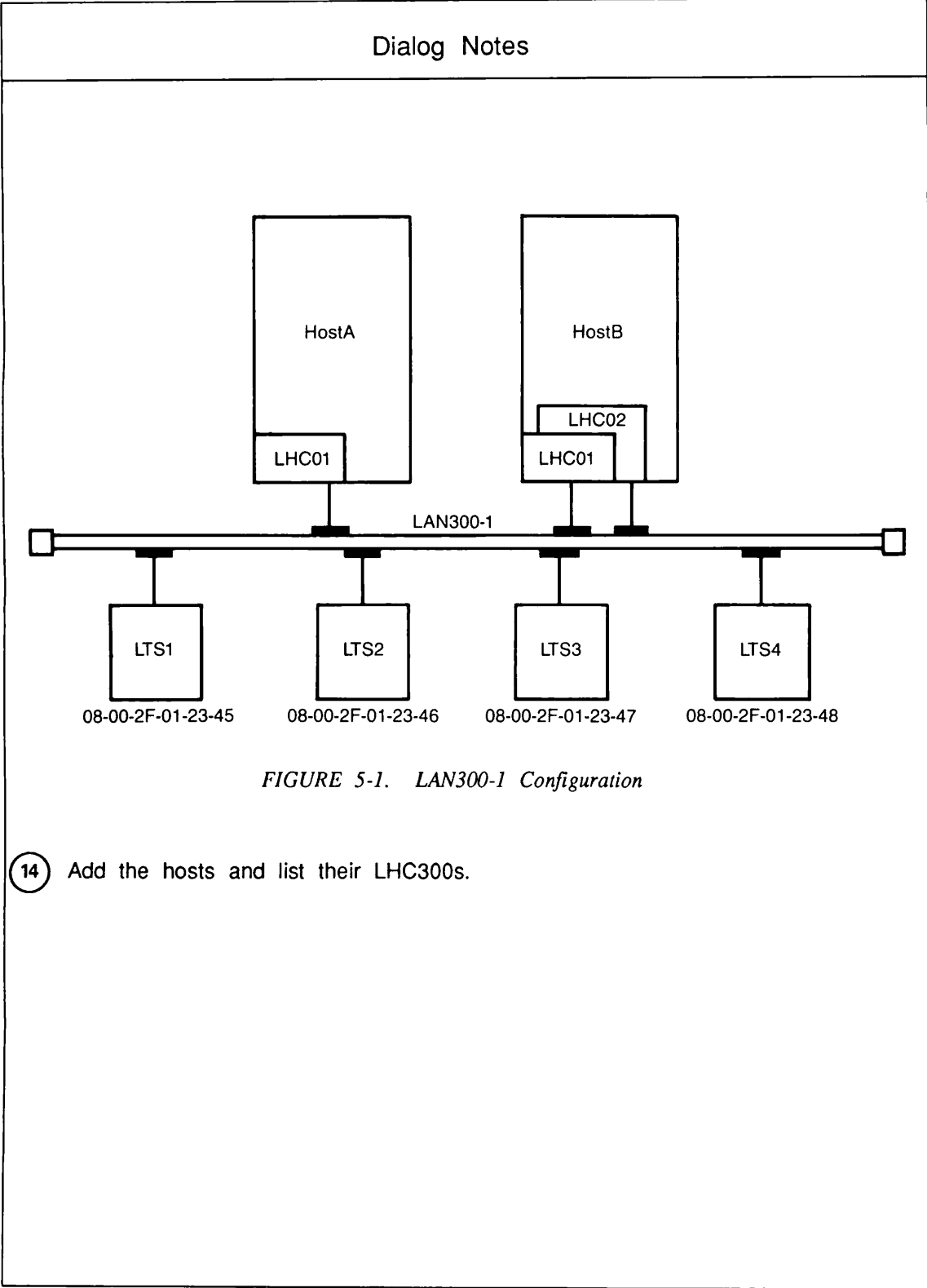


FIGURE 5-1. LAN300-1 Configuration

- 14 Add the hosts and list their LHC300s.

Create configuration file: NTS\*>NTS.CONFIG

NTS.CONFIG IS FOR LAN300-1, WHICH CONTAINS HOSTS A AND B, AND LTS1 THROUGH LTS4

- 1. Configure LAN
- 2. Configure Host by LAN
- 3. Configure Host by Name
- 4. Configure LTS by LAN
- 5. Configure LTS by Name
- 6. Display, list or spool configuration
- 7. Change configuration title
- H. Help
- S. Save current configuration
- Q. Quit configuration session

15 Enter selection: 4

Configuring LTS on LAN: LAN300-1

LAN300-1 CONTAINS HOSTA AND HOSTB. HOSTB PERFORMS NETWORK MANAGEMENT.

No LTSs are configured on this LAN.

Enter:

- A to add an LTS to the LAN
- F to finish (return to prev menu)
- S to save the current configuration
- Q to quit the configuration session

16 { Enter selection: [F] A  
Add LTS to LAN: LAN300-1  
Enter LTS name: **LTS1**  
Enter LTS address (nn-nn-nn): 08-00-2F-01-23-45

Configuring LTS on LAN: LAN300-1

LAN300-1 CONTAINS HOSTA AND HOSTB. HOSTB PERFORMS NETWORK MANAGEMENT.

The following LTSs are configured on this LAN:

-> 1. LTS1 08-00-2F-01-23-45

Enter the item number of the LTS to change, or:

- A to add an LTS to the LAN
- D to delete the selected LTS
- E to edit the selected LTS
- F to finish (return to prev menu)
- S to save the current configuration
- Q to quit the configuration session

Enter selection: [F] A

Add LTS to LAN: LAN300-1

Enter LTS name: **LTS2**

Enter LTS address (nn-nn-nn): 08-00-2F-01-23-46

## Dialog Notes

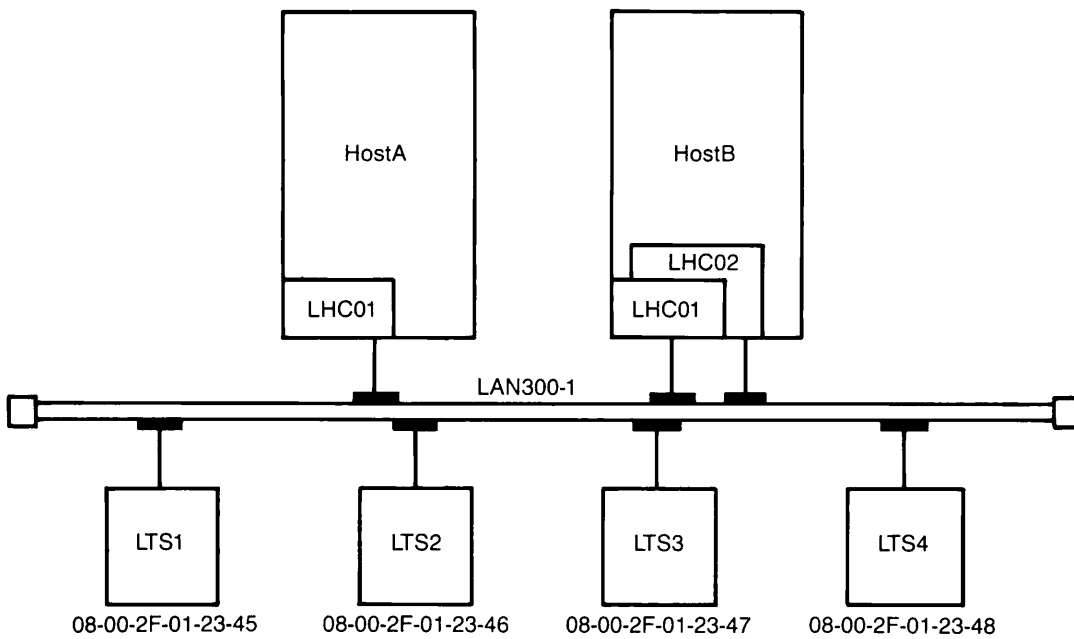


FIGURE 5-1. LAN300-1 Configuration

- 15 Configure the LTS300s next.
- 16 Add the LTS300s and give their addresses. LTS300 addresses are printed on a tag attached to the bottom of the unit. The first six digits cannot be changed; they are the range of addresses reserved for Prime LTS300s.

Configuring LTS on LAN: LAN300-1

LAN300-1 CONTAINS HOSTA AND HOSTB. HOSTB PERFORMS NETWORK MANAGEMENT.

The following LTSs are configured on this LAN:

- > 1. LTS1 08-00-2F-01-23-45
- 2. LTS2 08-00-2F-01-23-46

Enter the item number of the LTS to change, or:

- A to add an LTS to the LAN F to finish (return to prev menu)
- D to delete the selected LTS S to save the current configuration
- E to edit the selected LTS Q to quit the configuration session

Enter selection: [2] **A**

Add LTS to LAN: LAN300-1

Enter LTS name: **LTS3**

Enter LTS address (nn-nn-nn): 08-00-2F-01-23-47

Configuring LTS on LAN: LAN300-1

LAN300-1 CONTAINS HOSTA AND HOSTB. HOSTB PERFORMS NETWORK MANAGEMENT.

The following LTSs are configured on this LAN:

- > 1. LTS1 08-00-2F-01-23-45
- 2. LTS2 08-00-2F-01-23-46
- 3. LTS3 08-00-2F-01-23-47

Enter the item number of the LTS to change, or:

- A to add an LTS to the LAN F to finish (return to prev menu)
- D to delete the selected LTS S to save the current configuration
- E to edit the selected LTS Q to quit the configuration session

Enter selection: [2] **A**

Add LTS to LAN: LAN300-1

Enter LTS name: **LTS4**

Enter LTS address (nn-nn-nn): 08-00-2F-01-23-48

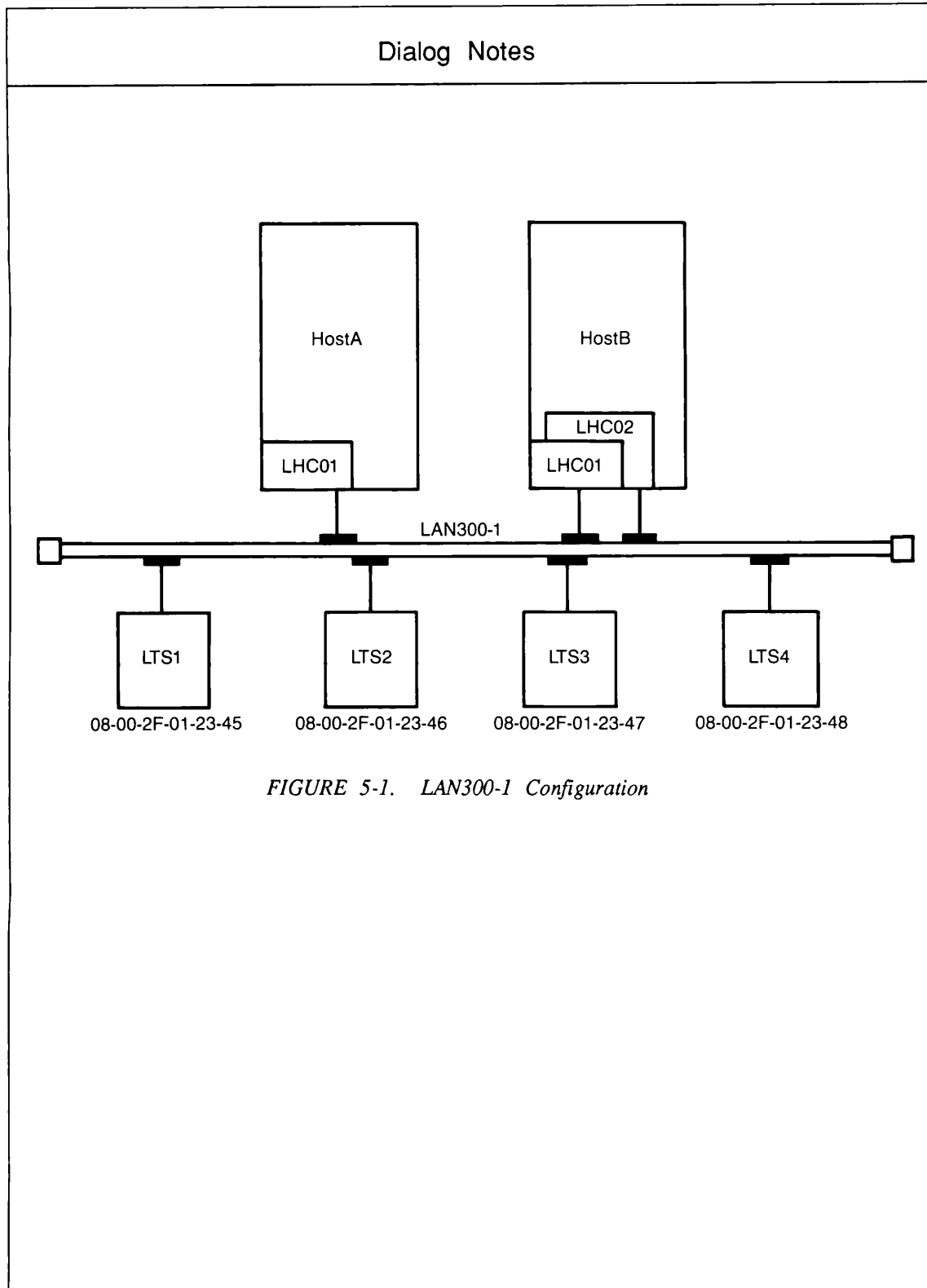


FIGURE 5-1. LAN300-1 Configuration



Configuring LTS on LAN: LAN300-1

LAN300-1 CONTAINS HOSTA AND HOSTB. HOSTB PERFORMS NETWORK MANAGEMENT.

The following LTSs are configured on this LAN:

-> 1.	LTS1	08-00-2F-01-23-45
2.	LTS2	08-00-2F-01-23-46
3.	LTS3	08-00-2F-01-23-47
4.	LTS4	08-00-2F-01-23-48

Enter the item number of the LTS to change, or:

A to add an LTS to the LAN	F to finish (return to prev menu)
D to delete the selected LTS	S to save the current configuration
E to edit the selected LTS	Q to quit the configuration session

17

Enter selection: [2] S

Enter configuration file name: [NTS.CONFIG] <RETURN>

Saving configuration...

Configuration saved.

Configuring LTS on LAN: LAN300-1

LAN300-1 CONTAINS HOSTA AND HOSTB. HOSTB PERFORMS NETWORK MANAGEMENT.

The following LTSs are configured on this LAN:

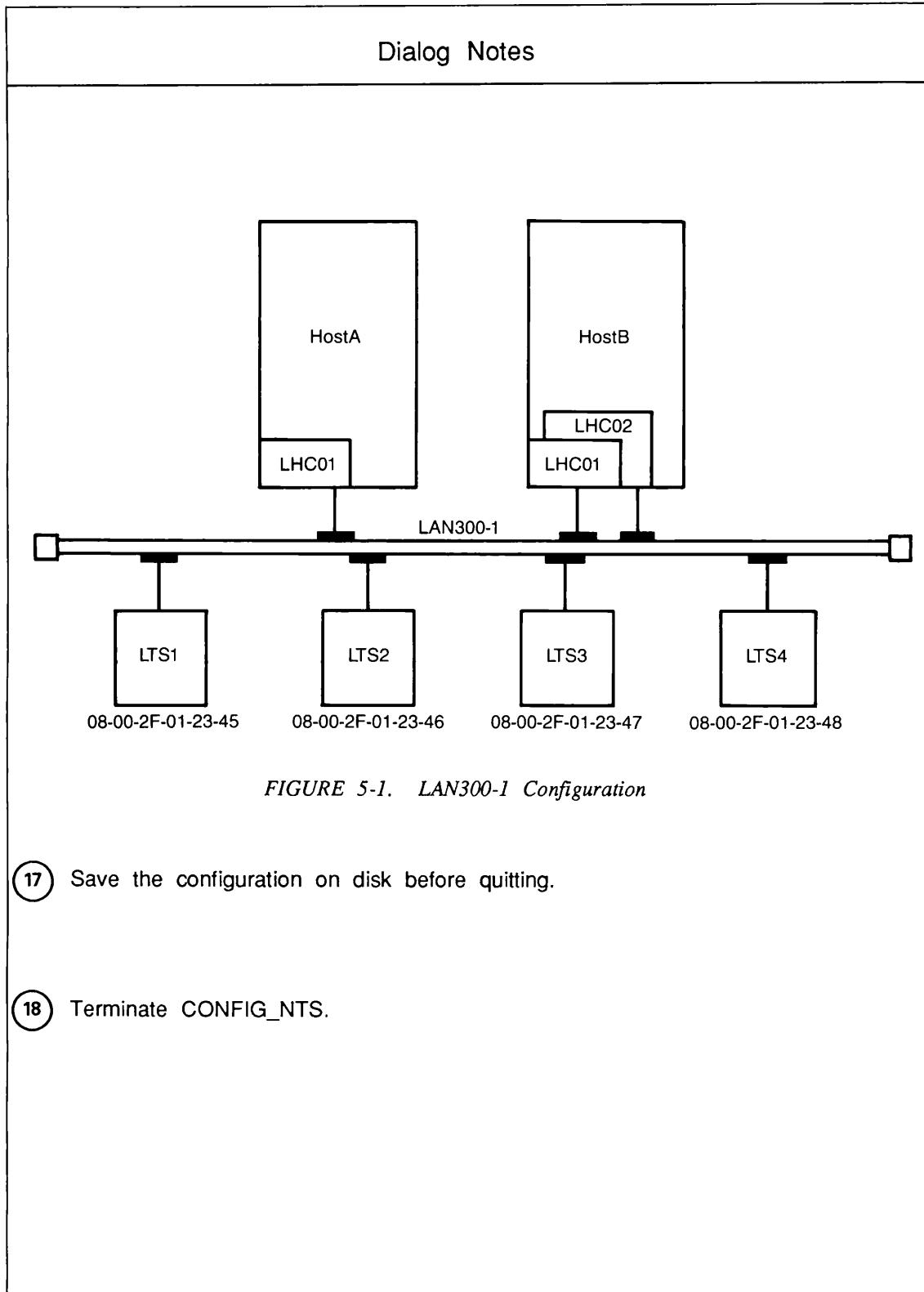
-> 1.	LTS1	08-00-2F-01-23-45
2.	LTS2	08-00-2F-01-23-46
3.	LTS3	08-00-2F-01-23-47
4.	LTS4	08-00-2F-01-23-48

Enter the item number of the LTS to change, or:

A to add an LTS to the LAN	F to finish (return to prev menu)
D to delete the selected LTS	S to save the current configuration
E to edit the selected LTS	Q to quit the configuration session

18

Enter selection: [2] Q



## Example Two: Editing an Existing Configuration

In this example, we edit the configuration created in Example One: Creating a New NTS Configuration to add a second LAN300, LAN300-2. LAN300-2 is attached to HostA by LHC00, a new LHC300 added to HostA. HostA performs all network management functions for LAN300-2. In addition, LAN300-2 has three LTS300s with these names and addresses:

- LTS7 08-00-2F-01-34-12
- LTS8 08-00-2F-01-34-13
- LTS9 08-00-2F-01-34-14

The editing is done in three major steps:

1. Use Option 1 from the CONFIG\_NTS Main menu, **Configure LAN**, to add and configure LAN300-2.
2. Use Option 3 from the CONFIG\_NTS Main menu, **Configure Host by Name**, to add LHC00 to HostA and to indicate that LHC00 is attached to LAN300-2.
3. Use Option 4 from the CONFIG\_NTS Main menu, **Configure LTS by LAN**, to add and configure the LTS300s on LAN300-2.

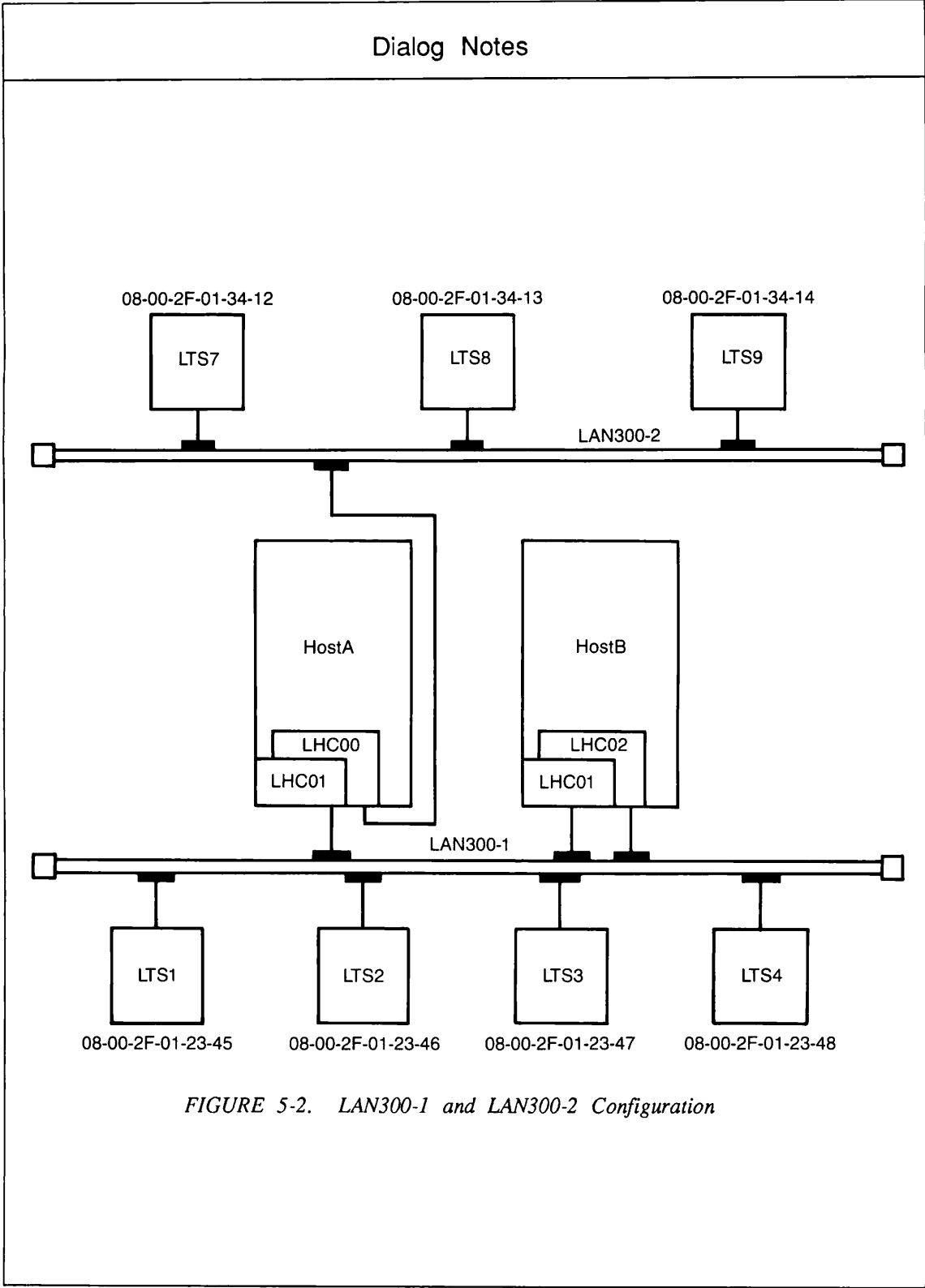


FIGURE 5-2. LAN300-1 and LAN300-2 Configuration

①

OK, *CONFIG\_NTS NTS.CONFIG -ED -TTP TTY*  
[CONFIG\_NTS Rev. 20.2.NTS Copyright (c) 1986, Prime Computer, Inc.]

Edit configuration file: NTS\*>NTS.CONFIG

NTS.CONFIG IS FOR LAN300-1, WHICH CONTAINS NODES A AND B, AND LTS1 THROUGH LTS4

File created on 09 Oct 86 at 22:26 by ASHO

- |   |                               |
|---|-------------------------------|
| 1. Configure LAN                        | H. Help                       |
| 2. Configure Host by LAN                | S. Save current configuration |
| 3. Configure Host by Name               | Q. Quit configuration session |
| 4. Configure LTS by LAN                 |                               |
| 5. Configure LTS by Name                |                               |
| 6. Display, list or spool configuration |                               |
| 7. Change configuration title           |                               |

②

Enter selection: 7

Enter 1 or 2 lines of configuration title:  
*NTS.CONFIG IS FOR LAN300-1 AND LAN300-2.*

Edit configuration file: NTS\*>NTS.CONFIG

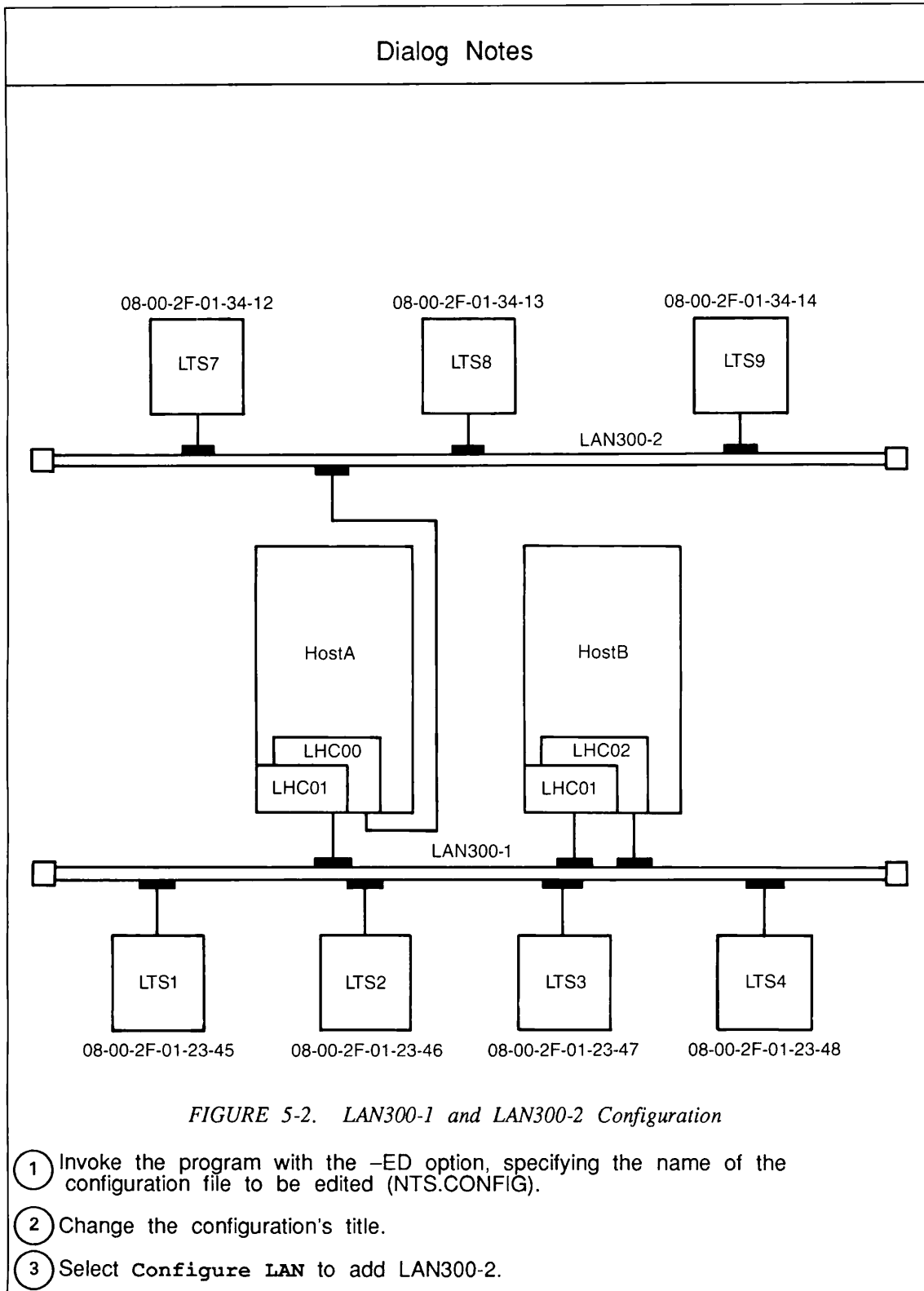
NTS.CONFIG IS FOR LAN300-1 AND LAN300-2.

File created on 09 Oct 86 at 22:26 by ASHO

- |   |                               |
|---|-------------------------------|
| 1. Configure LAN                        | H. Help                       |
| 2. Configure Host by LAN                | S. Save current configuration |
| 3. Configure Host by Name               | Q. Quit configuration session |
| 4. Configure LTS by LAN                 |                               |
| 5. Configure LTS by Name                |                               |
| 6. Display, list or spool configuration |                               |
| 7. Change configuration title           |                               |

③

Enter selection: 1



Configuration file: NTS\*>NTS.CONFIG

NTS.CONFIG IS FOR LAN300-1 AND LAN300-2.

The following LANs are configured:

-> 1. LAN300-1

LAN300-1 CONTAINS HOSTA AND HOSTB. HOSTB PERFORMS NETWORK MANAGEMENT.

Enter the number of the LAN to change or delete, or:

- A to add a LAN
- D to delete the selected LAN
- E to edit the selected LAN
- F to finish (return to main menu)
- S to save the current configuration
- Q to quit the configuration session

4

Enter selection: [F] **A**

Add LAN

5

Enter LAN name: [LAN300-2]

Enter 1 or 2 lines of (optional) text to describe this LAN:  
LAN300-2 CONTAINS HOSTA, WHICH PERFORMS NETWORK MANAGEMENT.  
IT ALSO HAS LTS7 LTS8 AND LTS9.

Allow unconfigured LTSs on this LAN? **NO**

Configure network management functions for this LAN? **YES**

LAN: LAN300-2

Network management functions for the LAN are configured as follows:

LTS Downline Load Hosts  
Primary :  
Secondary:

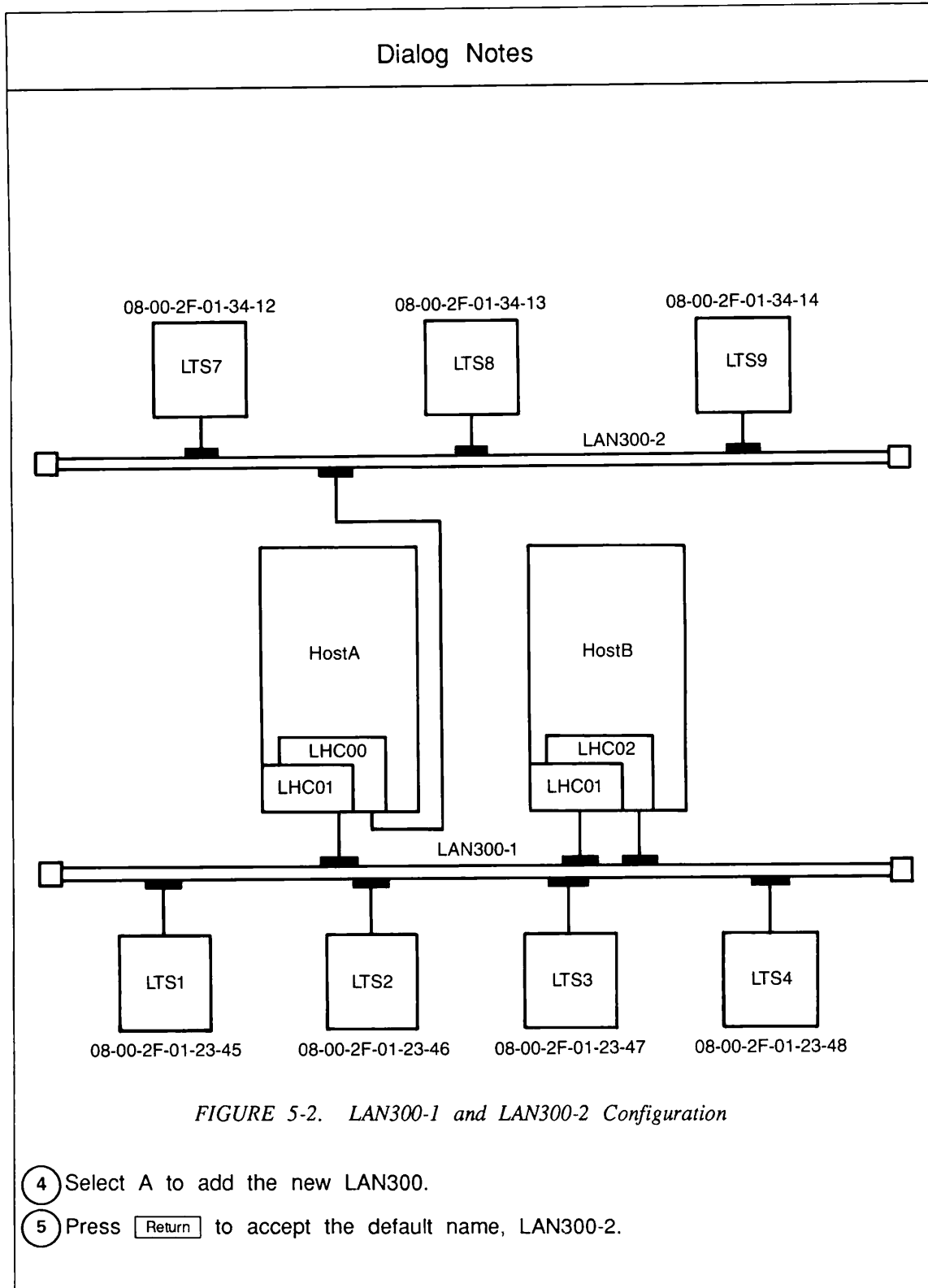
LTS Upline Dump Hosts  
Primary :  
Secondary:

LTS Event Reporting Hosts  
Primary :  
Secondary:

Enter:

- D to change downline load hosts
- U to change upline dump hosts
- E to change event reporting hosts
- F to finish (return to prev menu)
- S to save the current configuration
- Q to quit the configuration session

Enter selection: [F] **D**





- ⑥ Enter LTS downline load primary host name: **HOSTA**
- ⑦ HOSTA is not a configured host on LAN LAN300-2.  
Do you want to override errors due to unconfigured hosts? **YES**
- ⑧ Enter LTS downline load secondary host name: **<RETURN>**

LAN: LAN300-2

Network management functions for the LAN are configured as follows:

LTS Downline Load Hosts

Primary : HOSTA  
Secondary:

LTS Upline Dump Hosts

Primary :  
Secondary:

LTS Event Reporting Hosts

Primary :  
Secondary:

Enter:

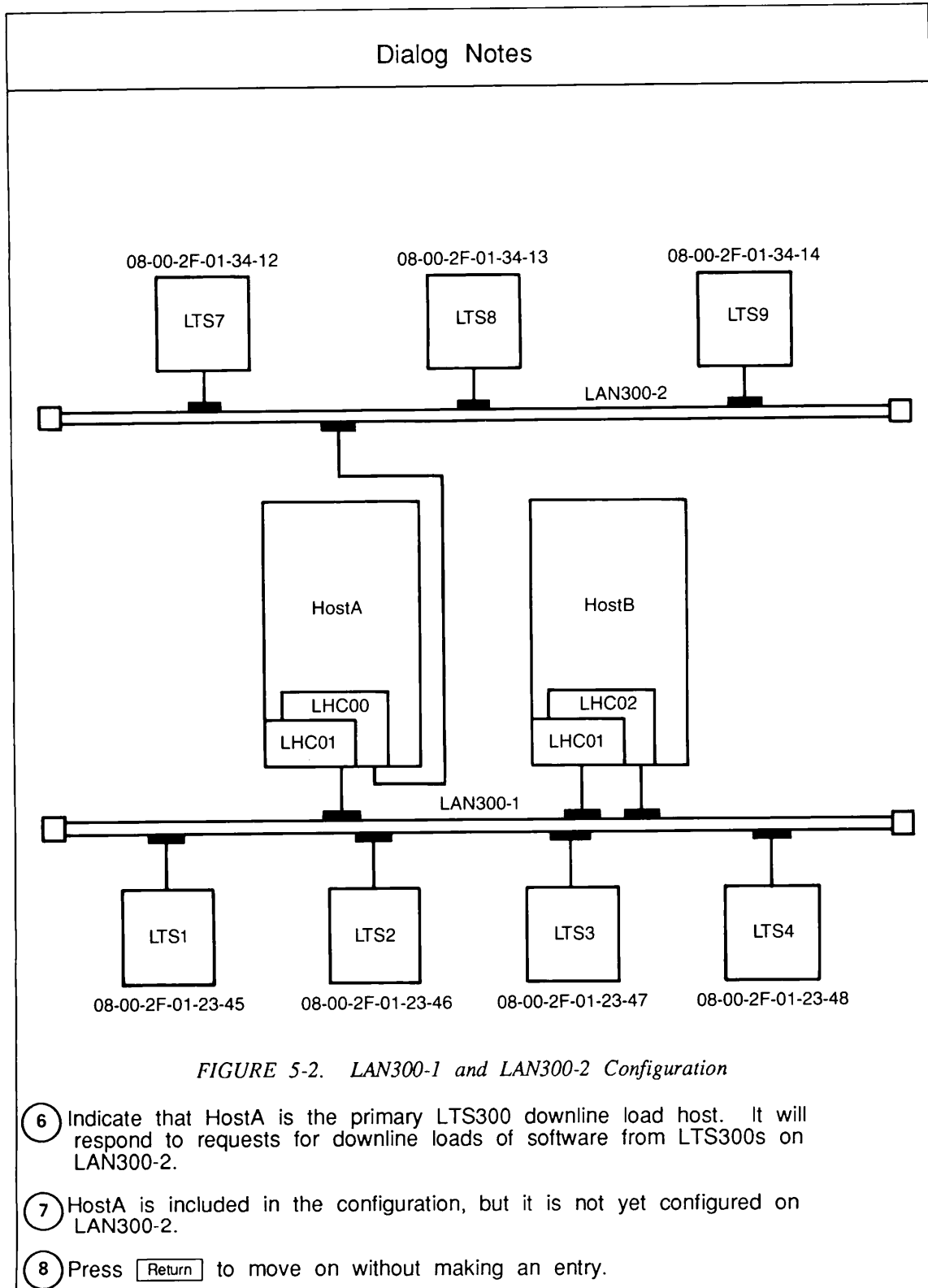
D to change downline load hosts    F to finish (return to prev menu)  
U to change upline dump hosts       S to save the current configuration  
E to change event reporting hosts   Q to quit the configuration session

Enter selection: [F] **U**

Enter LTS upline dump primary host name: **HOSTA**

Warning: HOSTA is not a configured host on LAN LAN300-2.

Enter LTS upline dump secondary host name: **<RETURN>**



LAN: LAN300-2

Network management functions for the LAN are configured as follows:

LTS Downline Load Hosts

Primary : HOSTA

Secondary:

LTS Upline Dump Hosts

Primary : HOSTA

Secondary:

LTS Event Reporting Hosts

Primary :

Secondary:

Enter:

D to change downline load hosts F to finish (return to prev menu)

U to change upline dump hosts S to save the current configuration

E to change event reporting hosts Q to quit the configuration session

Enter selection: [F] **E**

Enter LTS event reporting primary host name: **HOSTA**

Warning: HOSTA is not a configured host on LAN LAN300-2.

Enter LTS event reporting secondary host name: **<RETURN>**

LAN: LAN300-2

Network management functions for the LAN are configured as follows:

LTS Downline Load Hosts

Primary : HOSTA

Secondary:

LTS Upline Dump Hosts

Primary : HOSTA

Secondary:

LTS Event Reporting Hosts

Primary : HOSTA

Secondary:

Enter:

D to change downline load hosts F to finish (return to prev menu)

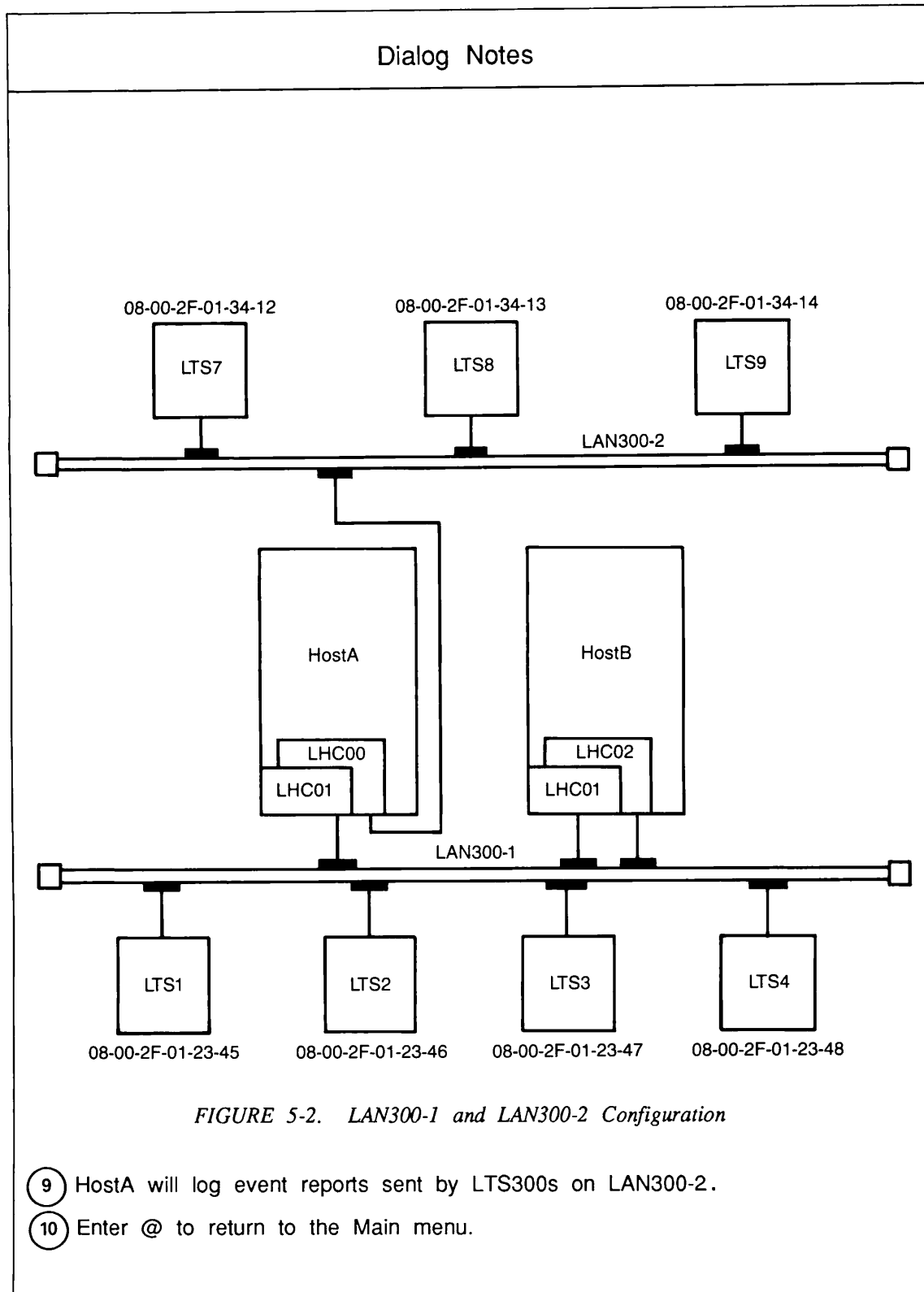
U to change upline dump hosts S to save the current configuration

E to change event reporting hosts Q to quit the configuration session

Enter selection: [F] **@**

9

10



Edit configuration file: NTS\*>NTS.CONFIG

NTS.CONFIG IS FOR LAN300-1 AND LAN300-2.

File created on 09 Oct 86 at 22:26 by ASHO

- |   |                               |
|---|-------------------------------|
| 1. Configure LAN                        | H. Help                       |
| 2. Configure Host by LAN                | S. Save current configuration |
| 3. Configure Host by Name               | Q. Quit configuration session |
| 4. Configure LTS by LAN                 |                               |
| 5. Configure LTS by Name                |                               |
| 6. Display, list or spool configuration |                               |
| 7. Change configuration title           |                               |

① Enter selection: 3

Configure host by name

The following hosts are configured:

- > 1. HOSTA
- 2. HOSTB

Enter the item number of the host to change, or:

- |                               |                                     |
|-------------------------------|-------------------------------------|
| A to add a new host           | F to finish                         |
| D to delete the selected host | S to save the current configuration |
| E to edit the selected host   | Q to quit the configuration session |

Enter selection: [2] E

Edit host: HOSTA

The host is configured as follows:

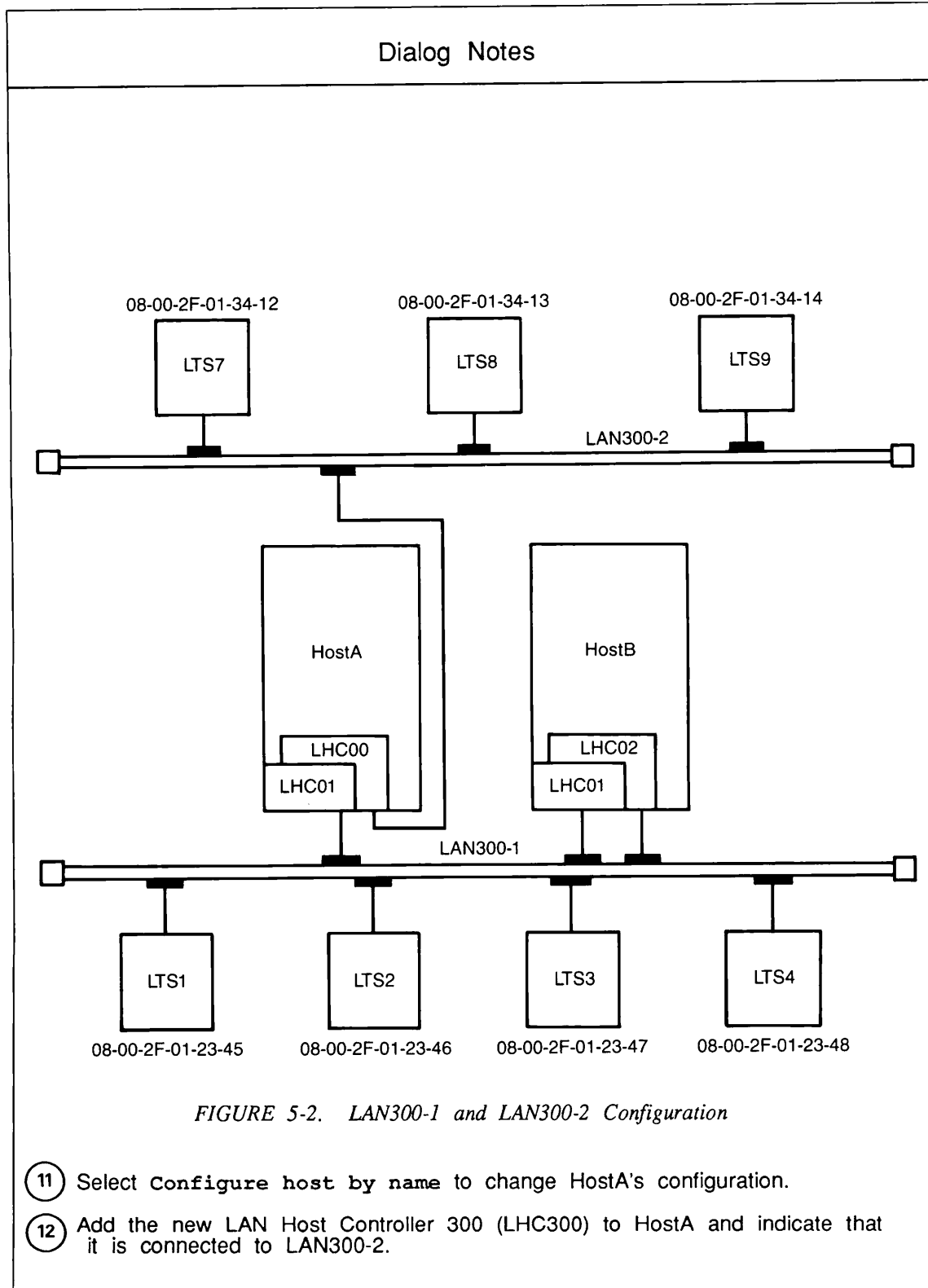
on LAN300-1: LHC01

Enter:

- |                          |                                     |
|--------------------------|-------------------------------------|
| A to add an LHC to a LAN | F to finish (return to prev menu)   |
| D to delete an LHC       | S to save the current configuration |
| R to rename the host     | Q to quit the configuration session |

Enter selection: A

② { Enter the LAN to which the LHC is connected: LAN300-2  
Enter the (blank separated) list of LHCs to add:  
LHC00



Edit host: HOSTA

The host is configured as follows:

on LAN300-2:	LHC00
on LAN300-1:	LHC01

Enter:

A to add an LHC to a LAN	F to finish (return to prev menu)
D to delete an LHC	S to save the current configuration
R to rename the host	Q to quit the configuration session

13

Enter selection: @

Edit configuration file: NTS\*>NTS.CONFIG

NTS.CONFIG IS FOR LAN300-1 AND LAN300-2.

File created on 09 Oct 86 at 22:26 by ASHO

1. Configure LAN	H. Help
2. Configure Host by LAN	S. Save current configuration
3. Configure Host by Name	Q. Quit configuration session
4. Configure LTS by LAN	
5. Configure LTS by Name	
6. Display, list or spool configuration	
7. Change configuration title	

14

Enter selection: 4

Configure LTS by LAN -- LAN selection

The following LANs are configured:

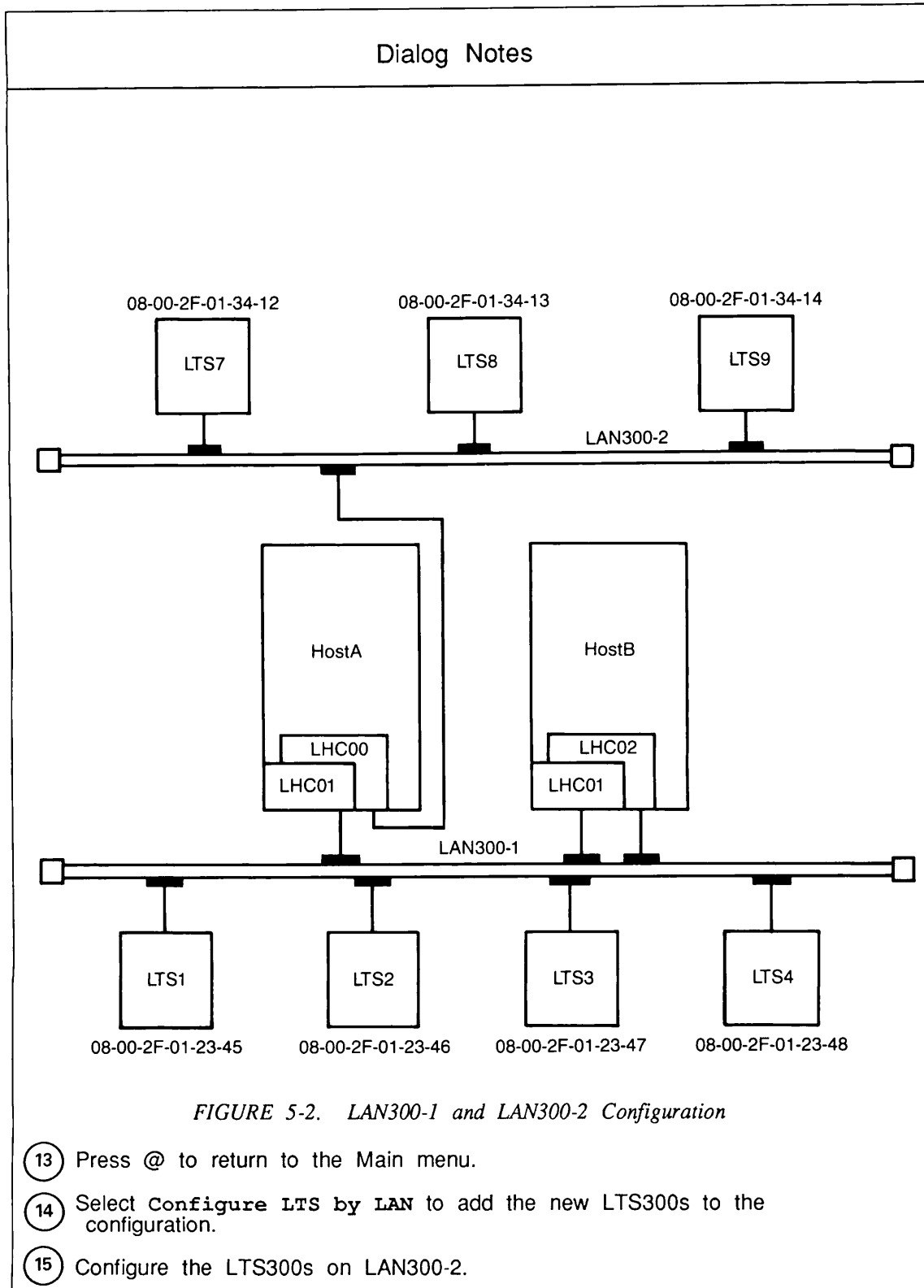
-> 1. LAN300-1  
2. LAN300-2

Enter the item number of the LAN on which the LTS will be configured,  
or:

F to finish (return to main menu)
S to save the current configuration
Q to quit the configuration session

15

Enter selection: [1] 2







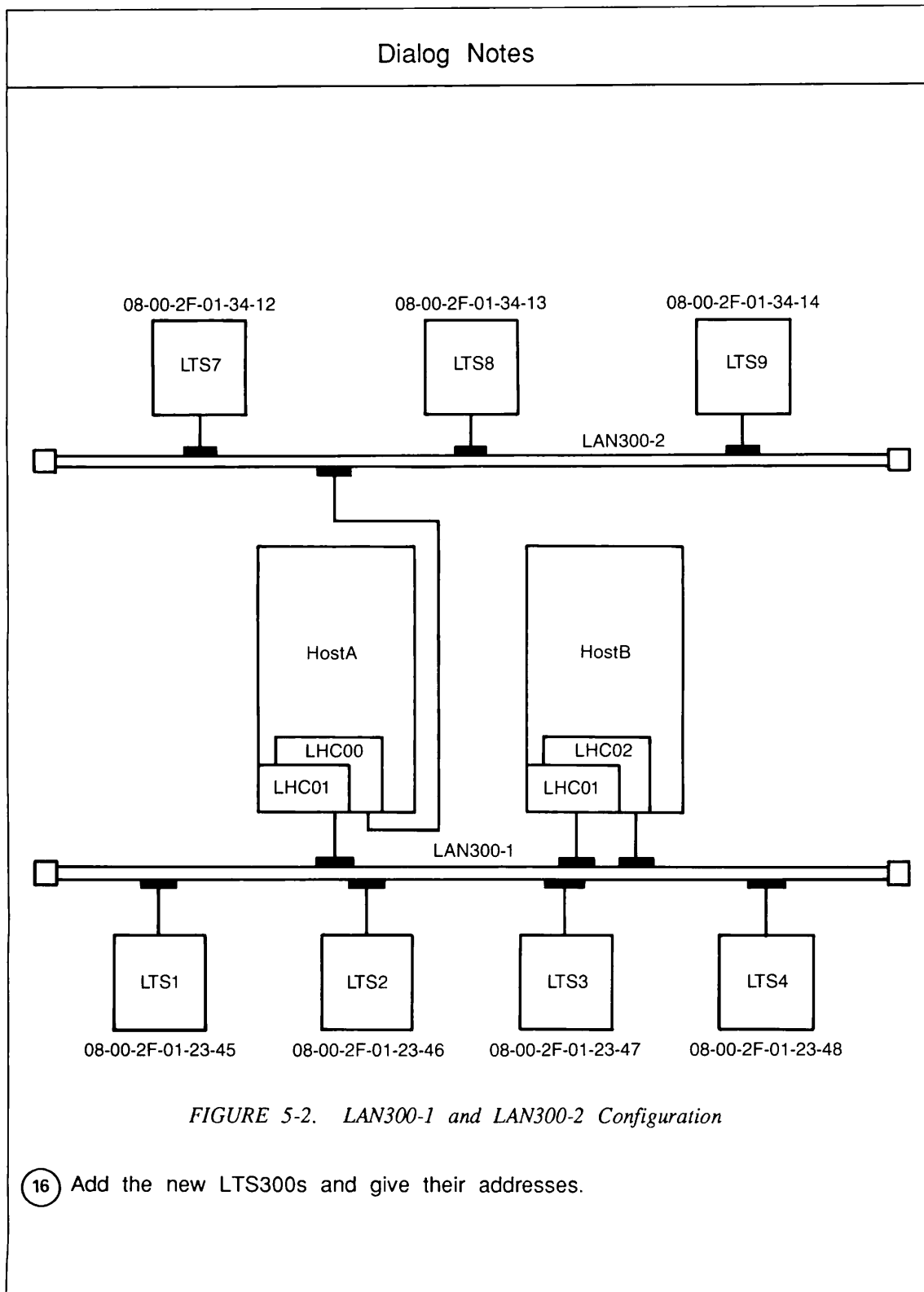


FIGURE 5-2. LAN300-1 and LAN300-2 Configuration

- ⑩ Add the new LTS300s and give their addresses.



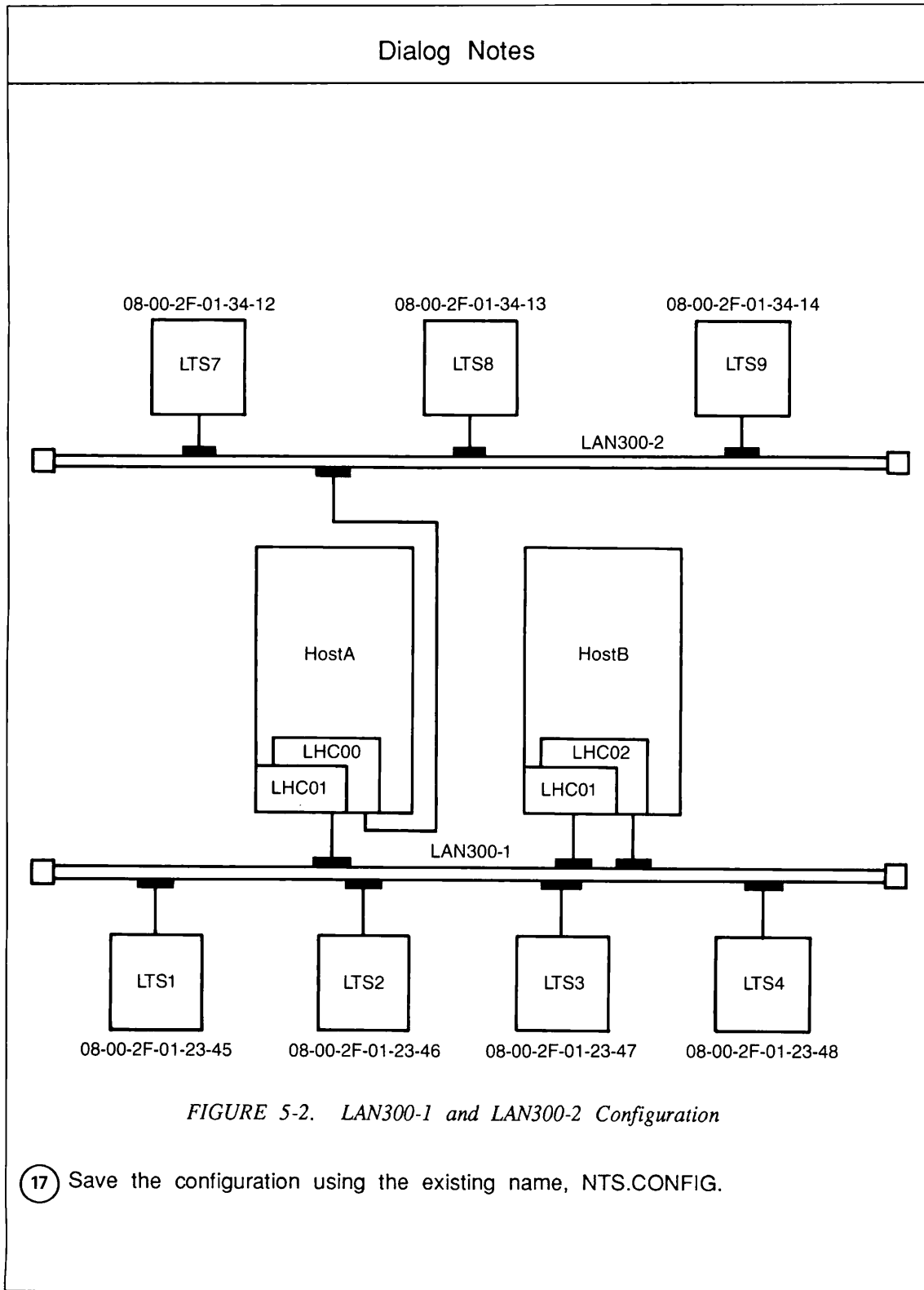


FIGURE 5-2. LAN300-1 and LAN300-2 Configuration

- 17 Save the configuration using the existing name, NTS.CONFIG.

---

# Appendix

---

# LAN300 Glossary

This appendix contains a glossary of LAN300 terminology.

## Access Control List (ACL)

*See* ACL.

## access right

Generally, the degree of access that a user or process has to a file or directory. For example, the Read (R) access right allows someone to view a file. *See also* ACL.

## ACL

A list of access pairs that specify the access rights of users. An access pair has the form

`identifier:access`

where *identifier* is an individual user ID, an access group (beginning with a period), or the identifier \$REST, and *access* is one or more of the following rights:

- O Sets all access rights (except P and ALL)
- P Protect a directory
- D Delete entries from a directory
- A Add entries to a directory
- L Read contents of a directory
- U Attach to a directory
- R Read contents of a file
- W Change contents of a file
- X Execute an Executable Program Format (EPF)
- ALL Allows all rights described above (OPDALURWX)
- NONE Allows no access rights whatsoever

An Access Control List (ACL) protects a file system object by allowing access only to the users listed in the ACL and by allowing those users only the access rights specified. The PRIMOS SET\_ACCESS (SAC) and EDIT\_ACCESS (EDAC) commands create or edit the ACL for a file system object. See the *Prime User's Guide* for more information on access control lists.

**asynchronous communication**

A method of transmitting data in which each character is preceded by a start *bit* and followed by a stop bit. The time interval between the characters may vary.

**asynchronous line**

A line that carries asynchronous communication.

**bit**

An acronym for binary digit. Eight bits constitute a byte.

**boot server**

A Prime host configured to respond to LTS300 requests for downline loads of software. *See also* downline load host.

**byte**

Eight bits of data. A character, for example, is one byte.

**cable segment**

A 500-meter (maximum) segment of standard IEEE 802.3 50-ohm coaxial cable. Cable segments form the physical transmission medium for most LAN300 networks. (The LAN Multiport Transceiver 300, described below, provides a cableless LAN300.)

**Carrier Sense Multiple Access with Collision Detection (CSMA/CD) access method**

*See* CSMA/CD.

**cascade**

To attach an LTS300 or LMT300 to another unit of the same type, rather than directly to the LAN300. As many as four LTS300s can be cascaded from each other; LMT300s can be cascaded two deep.

**CONFIG\_NET**

The PRIMENET configuration program, used to create or edit PRIMENET configuration files. Also the name of the command that invokes the program.

**CONFIG\_NTS**

The NTS configuration program, used to create or edit NTS configuration files. Also the name of the command that invokes the program.

**CSMA/CD**

Carrier Sense Multiple Access with Collision Detection, the access method used to determine which station on a LAN300 takes control of the communication medium and transmits the next message.

**Distributed Systems Management**

*See* DSM.

**downline load**

The process of writing operational software into a device that cannot load (or boot) itself, usually because it lacks permanent storage capability.

**downline load host**

A Prime host configured to load software into LTS300s across a LAN300 network. This service is required because LTS300s have no permanent storage capability. Normally, both primary and secondary downline load hosts are configured to reduce network traffic if the primary host goes down.

**DSM**

Distributed Systems Management, a set of software products and services that support the administration and day-to-day management of single and networked Prime computer systems. DSM enables systems to be administered and controlled collectively from any convenient point on the network and simplifies administrative tasks such as resource monitoring and event logging.

**dump server**

A host configured to receive upline dumps of LTS300 operational software. These upline dumps are used to analyze software failures.

**event**

A significant system or network occurrence such as a cold start, machine check, disk error, or network link problem.

**event reporting host**

A host configured to log LTS300 event, warning, and error messages. This is required because LTS300s do not run Distributed Systems Management (DSM). The host logs these messages to the local DSM Unsolicited Message facility, where they are placed in the file NETWORK\_MGT\*>NMSR.LOG.

**LAN**

A network in which independent computer systems are physically connected and communicate at a high speed over a short distance, such as within a building. RINGNET is Prime's Local Area Network that uses a ring topology. LAN300 is Prime's IEEE 802.3 compliant LAN that uses a bus topology.

**LAN Host Controller 300**

*See* LHC300.



### **LAN Multiport Transceiver 300**

*See* LMT300.

### **LAN Terminal Server 300**

*See* LTS300.

### **LAN Transceiver 300**

*See* LT300.

### **LAN300**

Prime's IEEE 802.3 compliant Local Area Network that uses a bus topology and the CSMA/CD access method. Most LAN300s consist of one or more 500-meter (maximum) segments of coaxial cable, joined by local or remote repeaters. The (LAN Multiport Transceiver 300, described below, provides a cableless LAN300.)

### **LAN300 Network Management Facility**

A layer of software that provides service functions to the LAN300. These functions are LHC300 downline loading and upline dumping, LTS300 downline loading, error and event reporting, statistics gathering, status commands, and a diagnostic loopback capability.

### **LHC300**

LAN Host Controller 300, an intelligent controller that is inserted in the backplane of a 50 Series host. An LHC300 provides an interface between PRIMOS and a LAN300, thereby supporting PRIMENET, NTS, both products concurrently, or WSI300.

### **LMT300**

A LAN Multiport Transceiver 300 (LMT300) provides network access for eight LHC300s or LTS300s. These devices are attached with transceiver cables. Since LMT300s can be cascaded two deep, as many as 64 nodes to be connected to the cable segment via the same MAU (64 LTS300s, cascaded four deep on each of the 16 LMT300 ports). This saves hardware costs when a large number of nodes are clustered in the same location.

LMT300s serve another purpose: they allow hosts and LTS300s to be connected into a network that does not contain a cable segment at all. Such a network is a cableless LAN300; its maximum size is also 64 LTS300s, as described above. LAN Multiport Transceiver 300s are also referred to as fanout units.

### **Local Area Network**

*See* LAN.

### **local repeater**

A single microprocessor-based component that links two 500-meter (maximum) coaxial cable segments, making a LAN300 as long as 1000 meters. Local repeaters boost the signal, allowing longer LAN300s.

**LT300**

LAN Transceiver 300 (LT300), a hardware component that provides network access for an LHC300 or an LTS300. The LT300 is attached to the cable segment by a MAU.

**LTS300 Command mode**

An LTS300 mode of operation in which the LTS300 accepts commands from terminal users to establish connections, change line parameters, and perform related tasks. *See also* LTS300 Data Transfer mode.

**LTS300 Data Transfer mode**

An LTS300 mode of operation in which the LTS300 transfers data to and from the remote host. *See also* Command mode.

**LTS300**

LAN Terminal Server 300, a microprocessor-based terminal server that provides network access for eight asynchronous terminals or other asynchronous devices. An LTS300 can be connected to the LAN300 via a transceiver cable and a transceiver, or cascaded from another LTS300.

**MAU**

A small mechanism that pierces a LAN300 cable segment, creating an attachment point for a transceiver or a repeater. The MAU used by Prime is called nonintrusive because it has a piercing pin mechanism that merely pierces the cable segment rather than separating it. Also referred to as a tap.

**multicast**

To place a message on the network without addressing it to a specific host. LTS300s multicast messages such as requests for downline loads of software.

**Network Administrator**

The person responsible for maintaining the proper and continuous operation of a network. Responsibilities include using CONFIG\_NTS to configure the network, ensuring that appropriate security measures are taken, and maintaining the daily network operation. Sometimes, the same person serves as Network Administrator and System Administrator. *See also* System Administrator.

**Network Terminal Service**

*See* NTS.

**node**

In LAN300 terminology, a host computer or an LTS300. Also referred to as a station.

### **NTS configuration**

A description of the topology, addresses, and Network Management responsibilities in one or more LAN300 networks. This information is included in the NTS configuration file.

### **NTS configuration file**

A segment directory that contains the NTS configuration in binary format. This file is created with CONFIG\_NTS, the NTS configuration program, and loaded into an NTS host with the START\_NTS command.

### **NTS**

A software product that supports communications between 50 Series hosts and asynchronous devices (usually terminals) over a LAN300 network. The asynchronous devices are attached to LAN Terminal Server 300s instead of hosts.

### **PNC**

PRIMENET Node Controller, hardware that controls ring protocol and the flow of data between nodes on a ring.

### **PNC II**

PRIMENET Node Controller II, hardware that controls ring protocol and the flow of data between nodes on a ring.

### **PRIMENET**

Prime's X.25-based networking software that provides Remote Login service, Remote File Access (RFA), File Transfer Service (FTS), NETLINK utility, and IPCF subroutines. PRIMENET runs on a number of physical transmission mediums: RINGNET LANs, LAN300 LANs, PSDNs, and synchronous lines.

All PRIMENET services run unchanged on LAN300s, except for minor differences in IPCF subroutines to accommodate for differences in the physical transmission medium. As many as 256 PRIMENET nodes can be attached to each LAN300.

### **PRIMENET Node Controller**

*See PNC.*

### **PRIMENET Node Controller II**

*See PNC II.*

### **protocol**

A set of rules governing communication between two systems in a network.

**remote repeater**

A remote repeater, also called a fiber optic repeater, consists of two microprocessor-based components joined by a fiber optic cable that can be as long as 1000 meters. This fiber optic cable is also called a link segment; there can be no stations attached to it. Each component of the remote repeater is also connected to one of the coaxial cable segments in the LAN300.

**START\_DSM**

Command that starts Distributed Systems Management (DSM) on a local system without interrupting PRIMOS operation.

**START\_NET**

Command that starts PRIMENET on a local system without interrupting PRIMOS operation.

**START\_NTS**

Command that starts NTS on a local system without interrupting PRIMOS operation.

**station**

A point on a LAN300 at which a host or LTS300, transceiver, and MAU are attached to a cable segment.

**STOP\_DSM**

Command that shuts down Distributed Systems Management (DSM) on a local system by logging out all DSM server processes. This command does not interrupt PRIMOS operation.

**STOP\_NET**

Command that shuts down PRIMENET on a local system without interrupting PRIMOS operation.

**STOP\_NTS**

Command that shuts down NTS on a local system without interrupting PRIMOS operation.

**System Administrator**

The person responsible for maintaining the proper and continuous operation of a system. The System Administrator's duties can include network-related tasks such as setting NTS-related ACL rights. The same person may serve as both the System Administrator and the Network Administrator. *See also* Network Administrator.

**transceiver**

A device that receives and transmits data simultaneously. LT300 and LMT300 transceivers provide LAN300 network access for LTS300s and LHC300s.

**transceiver cable**

A cable that connects an LHC300 or an LTS300 to a transceiver.

**upline dump host**

A host configured to receive upline dumps of operating software from LTS300s on the LAN300. These upline dumps are used to analyze software failures.

**WSI300**

A software product that allows Prime hosts to communicate with Prime workstations and non-Prime systems on a LAN300 using Transmission Control Protocol/Internet Protocol (TCP/IP). The TCP/IP FTP service transfers files between systems. TELNET, another TCP/IP service, allows users on Prime workstations and non-Prime equipment to log in to a 50 Series host. This product is used in conjunction with NTS.

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