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Supplemental Information and Release Notes

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DECnet-RSX

Supplemental Information and Release Notes

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This *DECnet-RSX Supplemental Information and Release Notes* manual describes network management enhancements to the DECnet-RSX product and provides release note information that is not included in the manual set. This information covers software and/or documentation corrections or changes made late in the documentation cycle.

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Preface

This *DECnet-RSX Supplemental Information and Release Notes* manual presents information on enhancements, modifications, and new features relative to this version of the DECnet-RSX product.

Intended Audience

This manual is intended for anyone who is responsible for building, maintaining, and managing a DECnet-RSX network. In this manual, all such people are collectively referred to as the network manager and, accordingly, have privileges appropriate for system management.

Structure of This Manual

This manual consists of two chapters.

- Chapter 1 - Describes the implementation of the new node name service and its supporting utilities (Node Name Collector, Server Control Program, and Node Name Server) that extend the node name service for DECnet-Micro/RSX and DECnet-11M-PLUS software. This chapter includes information on the following:
 - How to operate the node name service to manage the node name database.
 - How to operate the Server Control Program to start and stop the Node Name Server.
 - How to operate the Node Name Collector utility to create and reorganize an established permanent node name database.

- Chapter 2 - Provides release note information that describes enhancements and corrects errors in the existing documentation set. This chapter includes information on the following:
 - Correction of all outstanding documentation errors contained in previous versions of the DECnet-RSX product.
 - An increase to the number of LAT terminals permitted in DECnet-Micro/R SX and DECnet-11M-PLUS I/D networks.
 - Repair to problems with the Network Control Terminal (NCT) utility for all varieties of the DECnet-RSX product.
 - A fix for the NCT utility logical and CTERM (command terminal protocol) characteristics and CTERM WRITES that span multiple segments for all varieties of the DECnet-RSX product.
 - A new CFE command.

Associated Documents

Before reading this manual, you should have a working knowledge of DECnet software and the RSX-11 operating system you are using. A prerequisite to the effective use of this manual is familiarity with the overall character of DECnet software as described in the following manuals.

- *DECnet-RSX Guide to Network Management Utilities*
- *DECnet-RSX Guide to User Utilities*
- *DECnet-RSX Network Management Concepts and Procedures*
- *DECnet-RSX Network Generation and Installation Guide*
- *DECnet-Micro/R SX Installation Guide*
- *DECnet-RSX Network Manager's Pocket Guide*
- *DECnet-RSX Programmer's Reference Manual*
- *DECnet-RSX Programmer's Pocket Guide*
- *DECnet-RSX User's Pocket Guide*

Conventions Used in This Manual

The following graphic conventions are used throughout this manual.

Convention	Meaning
Special type	Special type in command examples indicates system output or examples of user input. Required user input is in .
UPPERCASE LETTERS	All command keywords are shown in uppercase. You can abbreviate command keywords to the first three characters or the minimum unique abbreviation.
<i>italics</i>	Lowercase italics in commands and report layouts indicate variables that you must replace with an appropriate word or value.
[]	Square brackets indicate that you can enter one, and only one, of the the enclosed options, but that it is not required. Do not type the brackets when you enter the option.
{ }	Braces indicate that you must enter one, and only one, of the enclosed options. Do not type the braces when you enter the option.
()	Parentheses enclose a set of options that must be specified together or not at all.
Options in lists	The absence of brackets around vertical lists indicates that the items are optional.
<code>Return</code>	This symbol indicates that you should press the <code>Return</code> key. Unless otherwise noted, all command lines are terminated by pressing the <code>Return</code> key.
<code>CTRL/x</code>	This symbol indicates that you should press the key labeled CTRL and the specified key simultaneously.

All numbers are decimal unless otherwise noted. All Ethernet addresses are given in hexadecimal.

New Technical Information

To help you build and maintain the extended node name database, this version of DECnet-RSX introduces the node name service. Past versions of DECnet-RSX software allowed you to store about 4,000 node name and address pairs in the database. The current release of DECnet-RSX software allows you to store approximately 64,000 pairs.

1.1 Overview of the Node Name Service

The Node Name Collector (NNC) utility within the node name service allows you to create a new node name database as described in Section 1.3.2, or reorganize an established permanent node name database as described in Section 1.3.3. You will read about these features and see them displayed within sample interactive dialogues. Section 1.3.4 tells you what actions to take when a conflict arises while you collect node names and addresses to build a database.

In addition to describing the procedures to use when you are working with the node name service, this chapter also tells you about components of the node name service.

The node name service consists of three components:

- The Node Name Collector (NNC)
NNC is a utility that helps you build a new permanent node name database as described in Example 1-1, or to reorganize an established database as described in Example 1-2.
- The Server Control Program (SCP)

SCP is used to start and stop the Node Name Server (see Section 1.1.2).

- **The Node Name Server (NNS)**

NNS manages the node name database at the request of network components (see Section 1.1.6).

With the release of this version of DECnet-RSX software, a permanent node name database (NNS.DAT) replaces the established database currently kept in CETAB.MAC.

For a listing of NNS return code information, see Section 1.5.

1.1.1 The Node Name Collector Utility

The NNC utility enables you to build a new node name database and reorganize an established node name database.

Prior to running NNC, you must assign LB: to the device contained by the network that is having its permanent node name database created or reorganized. You should set the UIC of the network being modified by NNC by using the command SET /NETUIC=[*netuic*].

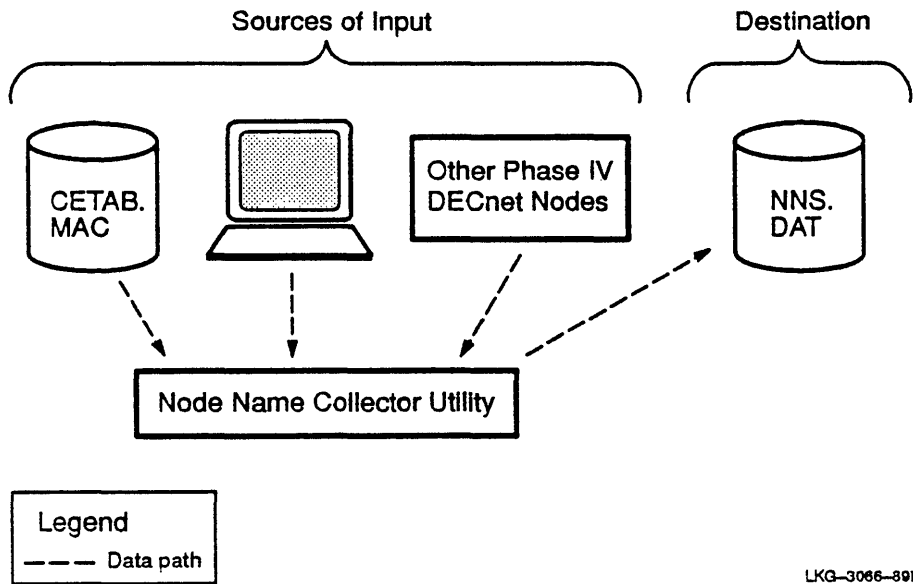
The sources of node name and address pairs input to NNC are:

- CETAB.MAC—versions of CETAB.MAC for software releases prior to DECnet-11M-PLUS V4.3 and DECnet-Micro/RXS V4.3
- The terminal
- Other Phase IV DECnet nodes

In the case of a database reorganization, an established permanent node name database (NNS.DAT) is the source of input.

Figure 1-1 shows the different sources and the destination of database input within the NNC utility.

Figure 1-1: Sources and Destination of Data in NNC



1.1.2 The Server Control Program

SCP is a utility that allows you to control NNS by starting and stopping the server.

The following are the SCP commands you use to control NNS:

- **START options** - causes the server to start
- **STOP options** - causes the server to stop
- **EXIT options** - causes SCP to stop, after which control returns to the CLI prompt

In these syntax statements, *options* are:

- **FROM *dduu*:[*net dir*]** - specifies the device and directory in which the network tasks reside. The FROM option may be applied only to the command START. The default value for this option is LB:[*netuic*].
- **CACHE-SIZE *x*** - specifies the size of the node definition cache in numbers of node definitions. The cache size is specified as a decimal value from 1 to 511. The CACHE-SIZE option may be applied only to the command START. The default value for this option is 50. (See the discussion of optimal cache sizing in Section 1.1.5.1.)
- **TEMPORARY-DATABASE-SIZE *x*** - specifies the size of the node definition database, in numbers of node definitions, used to hold temporary (volatile) definitions. The database size is specified as a decimal value from 1 to 64449. The TEMPORARY-DATABASE-SIZE option may be applied only to the command START. The default value for this option is 25.
- **SILENCE (*x*)** - suppresses display of informational, warning, and error messages (see Section 1.1.3). By default, all messages will be displayed unless you use this option. It is coded where *x* can be I, E, and/or W in any combination. For example, SILENCE (IE) suppresses display of informational and error messages but still allows warnings to be output; whereas SILENCE (I) silences only informational messages. The SILENCE option may be applied to the commands START, STOP, and EXIT.

1.1.3 SCP Error Message Information

SCP error messages documented in this section are classified according to severity and cause. Both classifications are described in the following paragraphs and are noted at the beginning of each error description.

1.1.4 Severity Classifications

Warning Type	Explanation
Informational	Gives status information not associated with an error condition.
Warning	Minor error. Processing continues.
Error	Major error. The command was rejected. The system waits for a new command.

1.1.5 Error Messages and Causes

SCP-I-1: The node name server was successfully *oper*

Indicates that the node name server was either successfully started or stopped.

SCP-W-0: The supplied file name will be ignored

The FROM option takes as its argument a device and directory where the node server permanent database can be found. If a file name is also supplied, this message will be displayed indicating that it will not be used.

SCP-E-*dec*: Failed to assign LUN to NN:

SCP could not assign the LUN to the node server device (NN:). The reason for failure is reflected in the directive error code, *dec*, in the message header.

SCP-E-375: Command file name syntax error

The name of the command file presented to SCP was not valid.

SCP-E-*dec*: Executive directive failure: Directive = *x*

The executive directive *x* failed with a directive error code of *dec*.

SCP-E-*fec*: Failed to *oper* file *filnam*

An FCS operation *oper* on file *filnam* failed with an FCS error code of *fec*.

SCP-E-0: FROM option argument error - *errtyp*

The argument supplied for the FROM option was in error. The error text *errtyp* explains the exact reason for the failure.

SCP-E-0: Illegal *element* at *errtxt*

An undefined option or command was detected in the command input, or an option was used inappropriately with a command.

SCP-E-377: An I/O error occurred while reading the command line from *filnam*. The I/O error code is *fec*

GCML detected an error while reading the command file *filnam*. The FCS error code *fec* describes the problem in detail.

SCP-E-374: Command file nesting limit of *lmt* exceeded

The maximum number of nested command input files *lmt* was exceeded.

SCP-E-*sts*: Server error - *errtxt*

The node name server encountered an error while trying to fulfill the current request. The server error code *sts* is described in detail by the text in *errtxt*.

SCP-E-*sts*: An unexpected status was returned from the node name server - *errtxt*

A status, *sts*, inappropriate for the current request was returned by the node server. The problem is described in detail by *errtxt*.

SCP-E-*sts*: An *errtyp* error occurred in the node name server while *oper*. The error status is *err*

Either an executive directive or I/O error was detected by the node server while it was trying to fulfill a user request. The operation being performed is defined by *oper*. Depending on the operation, *err* is either an I/O error code or a directive error code.

SCP-E-0: The *opt* option argument is *errtxt*

SCP detected a command option error with the *opt* option in the current command line. The error is described in detail by the *errtxt*.

SCP-E-376: Unable to open or reopen the command file *filnam*. The I/O error code is *fec*

The supplied command file *filnam* could not be opened. The FCS error code *fec* describes the exact nature of the problem.

SCP-E-330: Command line '*cmdlin*' too long

The command line supplied is too long.

SCP-E-0: The parameter(s) for the SILENCE option are missing or invalid

The arguments supplied for the SILENCE option are either:

- Missing
- Not I, W, E or some combination of the three
- Not enclosed in parentheses

1.1.5.1 Optimal Sizing for the Temporary Node Name Cache

As noted in Section 1.1.2, the cache size specifies the size, in numbers of node definitions, of the node definition cache. The cache size has a default value of 50. The temporary database size specifies the size, in numbers of definitions, of the node definition database used to hold temporary (volatile) definitions. The default value for this option is 25.

In order to optimize the use of system resources, you must adequately size the temporary node name cache and temporary database for your individual system requirements. Ideally, you would size the cache so that it would hold those node names that are the most frequently referenced. This allows optimal use of disk and memory resources.

1.1.6 The Node Name Server

Other DECnet components obtain node name and address information from the Node Name Server. This server is composed of the following five components:

- The server task (NT.NNS)
- The server device driver (NN:)
- The permanent node name database (NNS.DAT)
- The temporary node name database (NNS.TMP)
- The server common region

The functions of the NNS components are:

The server task (NT.NNS)

Fulfills the request for node name and address information.

The server task uses two task names: NT.NNS when it is executing and NT\$NNS when it is stopped.

The server device driver (NN:)

The interface between requesting tasks and the server.

The permanent node name database (NNS.DAT)

Contains permanent node name and address pairs.

The temporary node name database (NNS.TMP)

Contains volatile node name definitions.

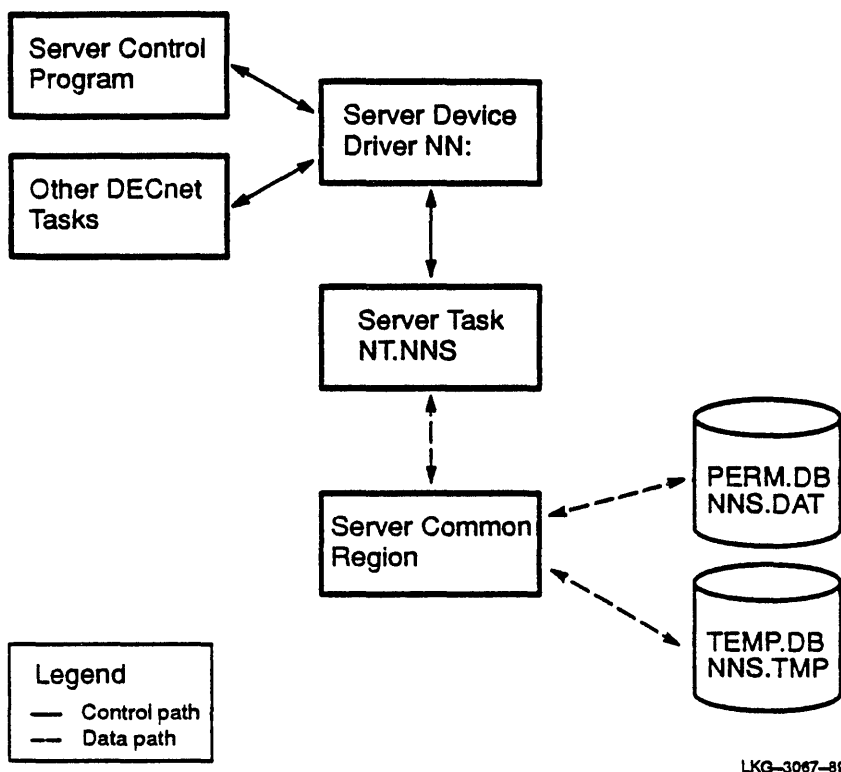
The server common region

Contains parts of the node name databases and a node name cache for quick access. This cache contains the most recently referenced node definitions.

As noted previously, the database is managed differently from past RSX versions. With this release, node definitions are no longer stored in CETAB.MAC. In order for DECnet components (such as CFE or VNP) to access node name information, NNS must be operating.

Figure 1-2 illustrates the components and the flow of data within NNS.

Figure 1-2: Structure of Node Name Service



1.1.7 System Crashes and Aborts

In the event of a system crash or NNS abort, you must clean up the network disk. After rebooting and before restarting the network, run the RSX-11M-PLUS Verify (VFY) utility to capture lost files. The Verify utility is documented in the *RSX-11M-PLUS Utilities Manual*. VFY should find the temporary node name database (NNS.TMP) which will be put into UIC [1,3]. This file should be deleted. If the permanent database (NNS.DAT) has blocks allocated but not used, you must not truncate them. If you truncate these blocks you will corrupt the database.

1.2 Considerations for Creating the Node Name Database

Before generating a network, please consider the method by which you will build the permanent node name database. The following text lists several methods and describes respective advantages and disadvantages of each. These points should influence your final decision on how you build the permanent node name database.

- Enter node names and addresses during NETGEN. Node names and addresses entered during NETGEN are no longer placed in CETAB.MAC. Instead they are moved to a file in [*netuic,1*]NETRND.CMD. When you initially start the network using NETINS.CMD, you invoke CFE using the command file NETRND.CMD to define the node names and addresses in the empty database provided by NETGEN. If you start the network by means other than NETINS.CMD, it is the user's responsibility to make sure the node name definitions are entered into the permanent database. The following table lists advantages and disadvantages of this method.

Advantages	Disadvantages
Quick method to set up the permanent database for a small network, or when only a small subset of node name definitions is needed.	NNS.DAT will not contain the executor node definitions, making it not generic, so NNS.DAT can not be distributed easily to other RSX nodes that support the node name service.

- After NETGEN is complete, use NNC to build a new permanent node name database. The following table lists advantages and disadvantages of this method.

Advantages	Disadvantages
Used to create the database if your network is very large and/or you want to construct a generic database containing all node definitions in your network.	Inconvenient if you start your network using the default database (supplied by NETGEN) and then build a new database. You must stop and restart the server to begin using the new database.
You need only build the database once and then distribute it to all other RSX nodes supporting the node name service.	
Useful because the existing database may be used with future networks.	

The commands to stop and restart the server are SCP STOP and SCP START FROM *dduu:[netuic]*.

To use NNC, you must first install it by using the following command:

INSTALL *dduu:[netuic]NNCtyp*, where *typ* is either RES or FSL, depending on how you generated your network.

- After the NETGEN is complete, use CFE or VNP to define node names and addresses in the empty database provided by NETGEN. The following table lists advantages and disadvantages of this method.

Advantages	Disadvantages
Quick method to set up the permanent database for a small network, or when only a small subset of node name definitions is needed.	NNS.DAT will not contain the executor node definitions, making it not generic, so NNS.DAT can not be distributed easily to other RSX nodes that support the node name service.

- Use NCP to define node names and addresses each time you start the network. The following table lists advantages and disadvantages of this method.

Advantages	Disadvantages
Quick method to set up the permanent database for a small network, or when only a small subset of node name definitions is needed.	<p>NNS.DAT will not contain the executor node definitions, making it not generic, so NNS.DAT can not be distributed easily to other RSX nodes that support the node name service.</p> <p>The node name database must be defined each time the network is started</p> <p>There is no permanent database which can be distributed to other RSX nodes.</p>

1.3 Using the NNC Utility

This section tells you how to initiate the build or reorganization procedures by specifying options displayed within a menu. Interactive dialog, as described in Section 1.3.1, shows you how to implement your option. Three examples help illustrate the node name database management tasks and show how to resolve the possible conflicting situations that might occur while running the NNC utility.

When you start NNC, the options you can exercise are displayed at your terminal (see Section 1.3.2). Enter all input from the terminal. Because you will not need to run this program frequently, NNC does not accept input from indirect command files.

The examples of interactive dialog instruct the user to exercise options. User responses appear in red type followed by **Return**. Where a default is selected, **Return** is shown.

Refer back to Figure 1-1 for an illustration of the flow of data from the possible sources of input flowing into the NNC utility and then to the destination in permanent storage (NNS.DAT).

1.3.1 Selecting Options from the Menu

The following section shows interactive dialog and the consequences of selecting the various options. Should problems arise with any menu selection, the information contained within the displayed text helps you choose the proper action.

The examples in the following section outline the procedures for:

- **Building the node name database by:**
 - Providing information from a terminal
 - Collecting information from CETAB.MAC
 - Collecting information from another Phase IV node
- **Reorganizing an existing node name database**

Reorganizing compresses dead space (caused by deleted node name definitions) and cleans up partial definitions caused by deletes or incomplete writes due to system crashes.

1.3.2 Building a New Node Name Database

NOTE

It is assumed that the network UIC has been set and LB: is assigned to the proper device (see Section 1.1.1).

The following example illustrates the interactive dialog generated when you use NNC to collect node names and addresses to build a new node name database.

Example 1-1: Collecting Node Names and Addresses for a New Database

>

To select a menu item, enter the letter to the left of the item's description at the prompt. Your choices are:

- A) Collect node names and addresses and build a node name database from them
- B) Reorganize an existing node name database
- C) Exit

Enter your choice here [Default:C] >

To select a menu item, enter the letter to the left of the item's description at the prompt. Your choices are:

- A) Input node names and addresses from the terminal
- B) Collect node names and addresses from old CETAB.MAC files
- C) Collect node names and addresses from another node
- D) Build the node name data base and exit to the main menu
- E) Exit to the main menu without building the node name data base

Enter your choice here [Default:D] >

Example 1-1

Example 1-1 (Cont.): Collecting Node Names and Addresses for a New Database

At the prompt, enter the node's address and name separated by a blank (for example, 12.386 FIDO). When there are no more node names and addresses to enter, press **Return** or enter **Ctrl/Z** to return to the previous menu.

Enter a node definition

Enter your choice here [Default:] >

Enter a node definition

Enter your choice here [Default:] >

Enter a node definition

Enter your choice here [Default:] >

To select a menu item, enter the letter to the left of the item's description at the prompt. Your choices are:

- A) Input node names and addresses from the terminal
- B) Collect node names and addresses from old CETAB.MAC files
- C) Collect node names and addresses from another node
- D) Build the node name data base and exit to the main menu
- E) Exit to the main menu without building the node name data base

Enter your choice here [Default:D] >

Enter the name of the CETAB.MAC file you want to collect node definitions from. To return to the previous menu, enter **Ctrl/Z** or press **Return**. (NOTE: Depending on the number of node definitions in the CETAB.MAC file, this operation could take several minutes to complete.)

Enter your choice here [Default: SY0:[005,054]CETAB.MAC] >

Example 1-1

Example 1-1 (Cont.): Collecting Node Names and Addresses for a New Database

Enter the name of the CETAB.MAC file you want to collect node definitions from. To return to the previous menu, enter **Ctrl/Z** or press **Return**. (NOTE: Depending on the number of node definitions in the CETAB.MAC file, this operation could take several minutes to complete.)

Enter your choice here [Default: SY0:[005,054]CETAB.MAC] > ^Z

To select a menu item, enter the letter to the left of the item's description at the prompt. Your choices are:

- A) Input node names and addresses from the terminal
- B) Collect node names and addresses from old CETAB.MAC files
- C) Collect node names and addresses from another node
- D) Build the node name data base and exit to the main menu
- E) Exit to the main menu without building the node name data base

Enter your choice here [Default:D] >

Enter the name of the node from which you want to collect node definitions. To return to the previous menu, enter **Ctrl/Z** or press **Return** without entering a node name. (NOTE: Depending on network activity, line speed, and the number of definitions being collected from the remote node, this operation could take up to several hours to complete.)

Enter your choice here [Default:] >

Enter the name of the node from which you want to collect node definitions. To return to the previous menu, enter **Ctrl/Z** or press **Return** without entering a node name. (NOTE: Depending on network activity, line speed, and the number of definitions being collected from the remote node, this operation could take up to several hours to complete.)

Enter your choice here [Default:] >

Example 1-1

Example 1-1 (Cont.): Collecting Node Names and Addresses for a New Database

To select a menu item, enter the letter to the left of the item's description at the prompt. Your choices are:

- A) Input node names and addresses from the terminal
- B) Collect node names and addresses from old CETAB.MAC files
- C) Collect node names and addresses from another node
- D) Build the node name data base and exit to the main menu
- E) Exit to the main menu without building the node name data base

Enter your choice here [Default:D] >

637. node definitions have been loaded into DU0:[005,054]NNS.DAT;4

To select a menu item, enter the letter to the left of the item's description at the prompt. Your choices are:

- A) Collect node names and addresses and build a node name database from them
- B) Reorganize an existing node name database
- C) Exit

Enter your choice here [Default:C] >

\$

1.3.3 Reorganizing an Existing Node Name Database

The following illustrates a sample dialog generated when you use NNC to reorganize an existing node name database.

Example 1-2: Reorganizing an Existing Database

>

To select a menu item, enter the letter to the left of the item's description at the prompt. Your choices are:

- A) Collect node names and addresses and build a node name database from them
- B) Reorganize an existing node name database
- C) Exit

Enter your choice here [Default:C] >

Enter the file specification of the node name database to reorganize. To return to the previous menu, enter **Ctrl/Z**. (NOTE: Depending on the number of node definitions in the database, this operation could take several minutes to complete.)

Enter your choice here [Default: SY0:[005,054]NNS.DAT] >

637. node definitions have been loaded into DU0:[005,054]NNS.DAT;5

To select a menu item, enter the letter to the left of the item's description at the prompt. Your choices are:

- A) Collect node names and addresses and build a node name database from them
- B) Reorganize an existing node name database
- C) Exit

Enter your choice here [Default:C] >

\$

1.3.4 Resolving Conflicts When Building a Database

When using NNC to build a database, conflicts arise when you attempt the following:

- Enter two node definitions having the same node address but with different node names
- Enter two node definitions having different node addresses but with the same node names

The following illustrates what actions to take when such conflicts arise.

Example 1-3: Resolving Conflicts When Building a Database

>

To select a menu item, enter the letter to the left of the item's description at the prompt. Your choices are:

- A) Collect node names and addresses and build a node name database from them
- B) Reorganize an existing node name database
- C) Exit

Enter your choice here [Default:C] >

To select a menu item, enter the letter to the left of the item's description at the prompt. Your choices are:

- A) Input node names and addresses from the terminal
- B) Collect node names and addresses from old CETAB.MAC files
- C) Collect node names and addresses from another node
- D) Build the node name data base and exit to the main menu
- E) Exit to the main menu without building the node name data base

Enter your choice here [Default:D] >

Example 1-3

Example 1-3 (Cont.): Resolving Conflicts When Building a Database

At the prompt, enter the node's address and name separated by a blank (for example, 12.386 FIDO). To return to the previous menu, enter **Ctrl/Z** or press **Return** without entering a node definition.

Enter a node definition

Enter your choice here [Default:] >

Enter a node definition

Enter your choice here [Default:] >

Enter a node definition

Enter your choice here [Default:] >

The node definition being added, OTHER (1.1) and the previous definition, FIRST (1.1), conflict. To resolve this condition, chose one of the menu items below by entering the letter to the left of the item's description at the prompt.

- A) Discard the definition being added
- B) Discard the previous definition
- C) Discard all of the conflicting definitions, both new and previous

Enter your choice here [Default:A] >

Enter a node definition

Enter your choice here [Default:] >

The node definition being added, SECOND (1.1) and the previous definitions, SECOND (1.2) and FIRST (1.1), conflict. To resolve this condition, chose one of the menu items below by entering the letter to the left of the item's description at the prompt.

- A) Discard the definition being added
- B) Discard the previous definitions
- C) Discard all of the conflicting definitions, both new and previous

Enter your choice here [Default:A] >

Example 1-3

Example 1-3 (Cont.): Resolving Conflicts When Building a Database

Enter a node definition

Enter your choice here [Default:] >

To select a menu item, enter the letter to the left of the item's description at the prompt. Your choices are:

- A) Input node names and addresses from the terminal
- B) Collect node names and addresses from old CETAB.MAC files
- C) Collect node names and addresses from another node
- D) Build the node name data base and exit to the main menu
- E) Exit to the main menu without building the node name data base

Enter your choice here [Default:D] >

To select a menu item, enter the letter to the left of the item's description at the prompt. Your choices are:

- A) Collect node names and addresses and build a node name database from them
- B) Reorganize an existing node name database
- C) Exit

Enter your choice here [Default:C] >

\$

1.4 Post-NETGEN Considerations

CFE, NCP, and VNP commands are used to modify an existing database. The following lists the commands and explains when to use them.

- CFE and VNP commands are used to add to, to delete from, or to show node names in the permanent database, NNS.DAT.
- NCP commands are used to add to, to delete from, or to show node names in the temporary database, NNS.TMP.

1.5 NNS Return Codes

A list of NNS return code information follows:

Symbol from NNSDF\$ -----	Description -----	Octal value -----	Decimal value -----
IS.SUC	Request was successful	1	1
IS.MOR	Request successful and there is more information to return	2	2
IS.DON	Request was successful and there is no more information to return	3	3
IE.SNP	Server not present	233	-101
IE.SNI	Server not initialized	232	-102
IE.SAI	Server already initialized	231	-103
IE.SSD	Server shutting down	230	-104
IE.CLS	Stream shutting down	227	-105
IE.IDV	Network device not valid	226	-106
IE.FID	FID not valid	225	-107
IE.TDS	Temporary database size error	224	-108
IE.CAS	Cache size error	223	-109
IE.DIR	Directive error	222	-110
IE.IO	I/O error	221	-111
IE.ALC	Internal pool allocation error	220	-112
IE.BCF	Bad control flags	217	-113
IE.BSI	Bad stream ID	216	-114
IE.BNA	Bad node address	215	-115
IE.BNM	Bad node name	216	-116
IE.BNF	Bad node flags	215	-117
IE.IE	Internal error - you should always make out an SPR	214	-118
IE.OOC	Operation out of context	213	-119
IE.DNF	Definition not found	212	-120
IE.NSK	No search key supplied - node name and address are missing	211	-121
IE.NAU	Node address in use	210	-122

IE.NNU	Node name in use	207	-123
IE.CAF	Failed to write or delete a definition from cache	206	-124

Release Notes

2.1 Release Description

These are release notes for DECnet-11M/S V4.5, DECnet-11M-PLUS V4.3, and DECnet-Micro/RSX V4.3 software.

2.1.1 Required Operating System Software

This kit can be generated and run on the following operating system versions:

- RSX-11M and RSX-11S V4.5
- RSX-11M-PLUS V4.2
- Micro/RSX V4.2

2.2 New Features

These are the major new features for this release:

- **The node name service.** The Node Name Collector (NNC) utility, the Server Control Program (SCP), and the Node Name Server (NNS), extending the node name database for Micro/RSX V4.2 and RSX-11M-PLUS V4.2 networks, are implemented.
- **Increase in number of interactive LAT terminals.** The maximum number of LAT terminals is increased to 128 for DECnet-Micro/RSX and DECnet-11M-PLUS I/D systems. The maximum number of LAT application terminals is 31.

- **NCT utility logical and CTERM repair.** NCT characteristics and CTERM WRITES that span multiple segments for all varieties of DECnet-RSX software, are repaired.
- **New CFE command.** The following CFE commands are added to handle allocation failures for receive buffers or large buffers:
 - DEFINE SYSTEM MINIMUM RECEIVE BUFFERS
 - DEFINE SYSTEM MAXIMUM LARGE BUFFERS
 - SET SYSTEM MAXIMUM LARGE BUFFERS
- **Correction of documentation errors.** All outstanding documentation errors contained in previous versions of DECnet-RSX software are corrected.

2.3 Reporting and Isolating Problems

To simplify record keeping for quick responses, a separate Software Problem Report (SPR) should be used for each problem.

User problems are often difficult to reproduce. Therefore, in the SPR please describe the system state when the problem occurred. Keep the description simple but accurate, and illustrate a general problem with several examples. When an SPR contains concise information about a problem, the problem is more easily reproduced and corrected. Please ensure that questions are direct and simply stated so that they can be answered clearly and directly.

2.3.1 Severe Errors

Severe errors are errors that hang or crash your system. To investigate and correct severe errors, the following information is essential:

- A description of the events leading up to the problem
- Console dialog or output, if appropriate
- A machine-readable copy of:
 - The crash dump file
 - The RSX symbol table file (RSX11M.STB)—for RSX-11M-PLUS only
 - The CEX symbol table file (CEX.STB)—for RSX-11M/S only
 - The CEX database file (CETAB.MAC)

- Any user task involved (source copy)
- The task build command files or parameters used at NETGEN for the appropriate network tasks involved
- The task build map files created during NETGEN for the appropriate network tasks involved
- If the problem is device related, the modem or type of local connection being used
- Suggestions for problem isolation

All media sent to Digital Equipment Corporation will be returned to the sender.

If the problem occurs when the network is running and involves software that does not use the network, unload the network software and see whether you can still reproduce the problem.

If the problem occurs during periods of high interrupt loading, try to reproduce the problem without the load. Examples of high interrupt loading include many active high-speed communications lines, many active terminals, and any process I/O operations.

If the problem involves file transfer or file access, please include a DAP trace of the situation. See the following sections on NFT, NFARs, and FAL for information on creating DAP traces.

2.3.2 Reporting a Documentation Error

When describing a problem in a manual, specify the full title of the manual, and identify the section and page number where the error occurs. Please list any recommendations or solutions that you have.

2.4 Documentation Changes

This section lists the changes to information in the DECnet-11M/S V4.5, DECnet-11M-PLUS V4.3, and DECnet-Micro/R SX V4.3 manual set.

2.4.1 DECnet-RSX Network Generation and Installation Guide

Please note the following changes to the *DECnet-RSX Network Generation and Installation Guide* manual:

- In Chapter 2, Section 2.1.1 — The host system can be an RSX-11M/S Version 4.4, an RSX-11M-PLUS Version 4.1, or a VMS system running VAX-11 RSX Version 2.4.
- In Chapter 2, Section 2.1.2 — A target system must be an RSX-11M/S Version 4.5, or an RSX-11M-PLUS Version 4.2.
- In Chapter 3, Section 3.1.1.2: This section must be removed because SYSGEN does not ask the question CE122 now. The LAT terminal server support is included in the terminal driver itself.
- In Chapter 3, Section 3.2.6.2 — Near the bottom of the page the two appearances of the word SUPPORT should not be on separate lines. (Red type in the documentation is used to indicate user responses; so there should not be red type here for these editorial insertions.) The text should read:

```
C$$CKP=0                ;CHECKPOINTING SUPPORT
D$$ISK=0                ;TASK LOADER SUPPORT
```

- In Chapter 3, Section 3.3.6.2 — Step 1 should note that the distribution tape must be loaded onto the tape device before mounting the tape. In step 3, the symbol *tdu* refers to the user's area.
- In Chapter 4, Section 4.2.1 — Before you run NETGEN, the logical LB: must be correctly assigned. Use the following MCR command, where *ddnn*: is the device that contains SYSLIB.OLB:

>
- The documentation on page 5-42 is not stated clearly. Actually, the default large data buffer size is calculated during NETGEN, and it varies depending on the network that is generated. Normally, a size of 292 is large enough for all normal network traffic, but if you generate all the network components and if LAT is also included in your system, then the default LDB size is 576.

- In Chapter 9, the note on page 9-1 should show the following command:

```
SET /NETUIC=[x,54]
```

where the syntax *x* refers to the group code of the NETINS.CMD procedure as declared during NETGEN.

- In Chapter 9, on page 9-9, replace the existing text of Section 9.3.1 with the following text (there is now an additional step).

To install a task using VMR commands, perform the following procedure. After you enter the PIP command, you must invoke the virtual monitor routine. Then the VMR will prompt you for the RSX-11S system image file name.

```
MCR>
MCR>
MCR>
Enter filename:
```

- In Chapter 10, Section 10.1.2 — The sample command for running the test should be:

```
>
```

where the syntax *ddnn*: indicates the device containing the generated network.

- In Chapter 10 — The following three lines of the sample listing for the NTEST.CMD are not displayed by the command file:

```
>SET /BUF=TI:80
>SET /UIC=[1,1]
>SET /UIC=[100,24]
```

- In Chapter 10 — The sample listing for the NTEST.CMD may be different than your actual listing. For example, the counters for Aged packet loss, Node out-of-range packet loss, and Partial routing update loss do not appear for end nodes. Also, NTEST.CMD may exist on a device other than SY.

2.4.2 *DECnet-RSX Guide to Network Management Utilities*

Please note the following changes to the *DECnet-RSX Guide to Network Management Utilities*:

- In Chapter 1, the SET EXECUTOR command — the MAXIMUM BROADCAST ENDNODES parameter is not supported.
- In Chapter 1, the NCP SET KNOWN CIRCUITS command — the COUNTER TIMER parameter is not supported.
- In Chapter 1, the SET KNOWN LINES command — the COUNTER TIMER parameter is not supported.

A clarification for LAT regarding application ports should be noted in Chapter 5, Section 5.3.9 SET PORT. The maximum number of ports that can be set for application terminals is 31.

Refer to Section 2.9 for new information about LAT and LCP.

2.4.3 *DECnet-Micro/R SX Installation Guide*

After you install DECnet-Micro/R SX on a Micro/PDP-11/23, you must reboot the system.

2.4.4 *DECnet-RSX Guide to User Utilities*

Please note the following changes to the (*DECnet-RSX Guide to User Utilities* manual:

Two additions have been made to the NFT switches that are discussed in Chapter 4. A new NFT switch, /CD, preserves the creation date of the output file created by a transfer. If this switch is not used, the output file is given the date and time of the transfer.

The switch /CO, has been modified. This switch, which forces the output file to have contiguous allocation, can now be explicitly negated (/CO) to force the creation of a noncontiguous output file. If neither /CO nor /CO is specified, the output file takes the same attribute as the input file.

2.4.5 DECnet-RSX Network Manager's Pocket Guide

Please note the following changes to the *DECnet-RSX Network Manager's Pocket Guide*:

- In the NCP and VNP Command Summary sections, the SET EXECUTOR command does not support the MAXIMUM BROADCAST ENDNODES parameter.
- In the NCP Command Summary section, the NCP SET KNOWN CIRCUITS command does not support the COUNTER TIMER parameter.
- In the NCP Command Summary section, the SET KNOWN LINES command does not support the COUNTER TIMER parameter.

2.4.6 DECnet-RSX Network Management Concepts and Procedures

Please note the following changes to the *DECnet-RSX Network Management Concepts and Procedures* manual.

- In Chapter 5, on page 5-8, Table 5-1 incorrectly shows the DELQA does not support down-line load detection. The table should read as follows:

DEQNA	N/A	5	5
DELQA	1	5	5

- On page 5-19, Table 5-2, the table entry for the LQA should be changed to the following:

LQA	SECQNA.SYS	TERQNA.SYS
-----	------------	------------

In the appendixes, please note the following changes:

- In the NCP and VNP Command Summary sections of Appendix A, the SET EXECUTOR command does not support the MAXIMUM BROADCAST ENDNODES parameter.
- In the NCP Command Summary section of Appendix A, the NCP SET KNOWN CIRCUITS command does not support the COUNTER TIMER parameter.
- In the NCP Command Summary section of Appendix A, the SET KNOWN LINES command does not support the COUNTER TIMER parameter.
- In Appendix A, the MAXIMUM BROADCAST ENDNODES parameter should not be listed for the SET EXECUTOR command in the VNP and NCP Command Summary sections.

- At the end of the Data Link Layer Event section on page D-17 of Appendix D, the text should read:

5.16 Collision detect check failed on line *n*

A check for collision detection failed on an Ethernet line. This message displays the name of the line to which the event applies.

2.4.7 DECnet-RSX Programmer's Reference Manual

Please note the following changes to the *DECnet-RSX Programmer's Reference Manual*:

- A documentation error appears on page 2-24 regarding the CONB\$\$ macro. Please note the description of the *fmt* and the *descrip* argument should read as follows:

fmt

is the descriptor format type. To connect to a named object, specify 1 for the descriptor format type and specify the *descrip* argument. To connect to a numbered object, specify 0 and omit the *descrip* argument.

descrip

is the target task name (1 to 16 ASCII characters). Specify this argument only if the object type is a named object (in other words, if you specified 1 for the *fmt* argument).

- The same documentation error appears on page 2-29 regarding the CONL\$\$ macro. Please note the description of the *fmt* and the *descrip* argument should read as described in the previous paragraph.
- On page 2-44, Table 2-4, the text in the status word 1 byte 1 column describing the NT.ABT condition should read "LUN over which the user abort message was received", instead of "LUN over which the network abort message was received."
- On page 2-65, the SPA\$ example near the top of the page is incorrect. The third line of the example appears as follows:

```
SPA$$      ... #CMPAST,<SPAAST>
```

Please change this text to read correctly:

```
SPA$$      ... #CMPAST,<#SPAAST>
```

- A documentation error appears on page 3-26, under the BFMT1 macro call. The explanation for the parameter *name* should be read as:

name

specifies a 1-to-16 element array/string containing the name of the target program.

- On page 3-41, Status Table B, the low-order byte and high-order byte descriptions for type code 3 are missing. The low-order byte description should read the same as the status word 1 byte 0 description (see Table 2-4, page 2-44) for the NT.DSC condition. The high-order byte description should read the same as the status word 1 byte 1 description (see Table 2-4, page 2-44) for the NT.DSC condition.

Also note the type of message for type code 4 should read "User abort", instead of "User disconnect".

- The low-order byte and high-order byte descriptions for type code 4 are missing. The low-order byte description should read the same as the status word 1 byte 0 description (see Table 2-4, page 2-44) for the NT.ABT condition. The high-order byte description should read the same as the status word 1 byte 1 description (see Table 2-4, page 2-44) for the NT.ABT condition.
- A documentation error appears in Table C-3 on page C-6. The last column (Miccode Table) refers to the table in the appendix which contains miccode values that correspond to maccode values. All references to Tables E-2, E-3, and E-4 should be changed to C-4, C-5, and C-6, respectively.

2.4.8 DECnet-RSX Guide to User Utilities

Please note the following changes to the *DECnet-RSX Guide to User Utilities* manual:

- The following footnote should be added to Table 5-1 on page 5-4:
The APPEND, COPY, SPOOL, and SUBMIT commands now support the /BK qualifying switch.
- The text explaining the block mode xfer qualifying switch (/BK) should be added to page 5-6. This text will be identical to the BK text on page 4-15, Section 4.2.3.
- In Chapter 8, in Section 8.5.9, page 8-16, add the following description of how to use the MAIL command from PHONE utility:
RSX Mail-11 product must be installed on the system in order to use this command.
- In Appendix A, Section A.2.3, on page A-10, the explanation of NFT's secondary error message was not documented. The information should read:

Input file has conflicting attributes

This error is caused by the concatenation of files with different attributes.

- In Appendix A, Section A.6.2, on page A-31, please add the following error message:

An error has occurred trying to send mail. MAIL and/or SEND task not installed.

This message indicates that the necessary RSX Mail-11 product tasks are not installed on the system.

2.5 NETGEN Notes

2.5.1 Prerequisites

This release of DECnet-RSX software runs on the following systems:

- RSX-11M V4.5
- RSX-11S V4.5
- RSX-11M-PLUS V4.2
- Micro/RXS V4.2

Saved answer files from DECnet-11M-PLUS V4.0, DECnet-Micro/RXS V4.0, DECnet-11M V4.3, DECnet-11S V4.3 and older releases can not be used.

The following information belongs in Section 9.0 (see note on page 9-1) of the *DECnet-RSX Network Generation and Installation Guide* manual.

If you set the network UIC to the wrong UIC, NETINS.COMD will use that UIC and may load the wrong network.

In Chapter 9, on page 9-14, in Section 9.4.3, Loading the Network Using VNP Commands, when doing an RSX-11S NETGEN under VAX-11, the file extension .TSK for VNP should be used on the RUN command to invoke VNP, or you can rename the task to VNP.EXE and invoke VNP without specifying the file extension. This should also apply to CFE and NDA.

2.5.2 Abnormal NETGEN Termination

The information in Section 4.6 (see page 4-12) of the *DECnet-RSX Network Generation and Installation Guide* manual should read:

If NETGEN terminates abnormally with an "AT." error message (such as ...AT.—File read error), or if it simply stops prematurely with an end-of-file (such as @<EOF>) on the command file, the indirect command file processor (AT.) most likely encountered a disk error. Restarting NETGEN from the beginning and using a different disk drive may alleviate the problem.

2.6 Device Notes

2.6.1 Powerfall Recovery

If a power failure occurred while any DMC-11 line was active, there is a possibility that the DMC can corrupt memory before the network software is aware of the recovery. This situation can cause the system to crash.

2.6.2 Error Counters

If a header CRC error occurs as a result of line interference, the Header Format Error counter flag and the Buffer Too Small Error counter flag might be incremented instead of the Header CRC Error counter. This happens because the device drivers check these conditions before calculating the header CRC.

2.6.3 Device CSRs for Down-Line Loaded Systems

The following information belongs in Section 3.2.6 (see page 3-26) in the *DECnet-RSX Network Generation and Installation* manual.

It is important to have the "floating" device Controller Status Registers (CSRs) at the proper addresses on the system to be loaded. The proper addresses are determined by the standard UNIBUS and Q-bus device rankings. The command file [200,200]FLOAT.COMD on the DECnet distribution kit will help you determine what these CSR addresses should be.

2.6.4 Down-Line Loading 11S Systems

Please add the devices DELUA, DELQA to the text in the *DECnet-RSX Network Management Concepts and Procedures* manual in Section 5.1.1.3, page 5-6, paragraph 1.

The following paragraph belongs as a footnote in Table 5-1, on page 5-8.

If you down-line load an 11S system to a remote node that contains a DELQA, the node database on the host node should have TERQNA.SYS specified as the tertiary loader. Refer to the *DELQA User's Guide* for the switch settings that enable down-line system loading.

2.7 System Notes

The following information belongs in the *DECnet-RSX Network Concepts and Procedures* manual, Section 6.

2.7.1 Testing

If you run NTEST after NETGEN by the remote node function, you must install DTR and FAL as described in *DECnet-RSX Network Generation and Installation Guide*, page 10-22, Section 10.3.1.

2.7.2 Tuning

When tuning your system, you should periodically check the system counters, using the command NCP SHOW SYSTEM COUNTERS.

If there are allocation failures for receive buffers, increase the minimum number of receive buffers, using the CFE command DEFINE SYSTEM MINIMUM RECEIVE BUFFERS. You may also want to use the CFE command SET SYSTEM MAXIMUM LARGE BUFFERS to increase the number of large buffers. By increasing the minimum number of receive buffers, you effectively decrease the number of large buffers that can be used for transit messages.

If there are allocation failures for large buffers, use the CFE command DEFINE SYSTEM MAXIMUM LARGE BUFFERS to increase the number of large buffers. Alternately, you can decrease the minimum number of receive buffers, using the CFE command DEFINE SYSTEM MINIMUM RECEIVE BUFFERS, because this effectively increases the number of large buffers that can be used for transit messages. If you do this, however, watch for allocation failures on receive buffers.

2.7.3 Support for Multi-Segment CTERM WRITE Messages

A correction has been made to the Network Command Terminal (NCT) process to support multi-segment CTERM WRITES. Multi-segment CTERM WRITE messages are received whenever the data buffer is larger than the size of a Large Data Buffer (LDB). The message is segmented on the transmit side and then sent in multiple packets. These packets are then reassembled on the receive side by NCT into a large buffer, allocated from the network pool, and then output in a single QIO.

The size of the buffer allocated by NCT for multi-segment WRITES is 8128 bytes, which is the largest write allowed by the terminal driver. In the event NCT is unable to allocate the required buffer space when a multi-segment CTERM WRITE is processed, then each message is written as it arrives. If this occurs, the text will probably be displayed incorrectly on the user's screen due to the carriage control written with each message.

2.7.3.1 Allocating Network Pool For Multi-Segment WRITES

If your system uses multi-segment messages and you want to enable this capability, you must allocate additional network pool using the CFE command `DEFINE SYSTEM POOL BLOCK-AREA n`. This command specifies the number of 32-word blocks to allocate. To calculate the value for `POOL BLOCK-AREA n`, use the following equation:

$$\text{current UMR-unmapped block-area} + ((\text{number-of-buffers} * 8128) / 32)$$

The current UMR-unmapped block-area can be obtained by using the CFE command `LIST SYSTEM`. The number-of-buffers is the number of connections that will be using multi-segment CTERM WRITES. For example, to enable three connections for multi-segment WRITES, the additional blocks necessary would be calculated with the following equation:

$$(3 * 8128) / 32 = 762$$

After you increase the network pool in the permanent network database using CFE, you must change the volatile network database by reloading the network. There is no equivalent NCP command to change the network pool since this area is allocated when the network is loaded. If the VNP command was used on your system, you must issue the appropriate VNP commands to unload and reload the network in the system image.

The advantages of this network enhancement are:

- Faster writes for multi-segment messages since only one QIO is issued for the entire message.

- Applications writing large buffers to the screen now display properly on the user's terminal.
- You tailor your network with the number of connections requiring multi-segment WRITES.

The disadvantages of this network enhancement are:

- You must calculate and allocate the additional network pool manually instead of automatically during the NETGEN process.
- You must reload the network after you increase the network pool using CFE to enable this feature.
- You cannot specify which lines have this feature enabled for them. All connections will attempt to use this feature when multi-segment WRITE messages are processed.

2.7.4 Powerfall Recovery

If a power failure occurs during the loading of network software, logical links may be aborted and switched lines are disconnected. They are restarted upon recovery.

2.7.5 Running SHUTUP

The Shutup procedures used under RSX-11M and RSX-11M-PLUS correctly dismount the network during the dismount phase. If you want to clear the network from memory during Shutup, include the following entry in LB:[1,2]SHUTUP.CMD:

```
NCP SET EXECUTOR STATE OFF
.WAIT NETACP
NCP CLEAR SYSTEM
```

Because the NCP command SET EXECUTOR STATE OFF completes asynchronously, issuing the CLEAR SYSTEM command immediately afterwards displays the following error message:

```
NTL -- Device NS: Still Active
```

Including .WAIT NETACP avoids this problem.

2.7.6 CFE Utility Enhancements

The following information belongs in Section 1.1 of the *DECnet-RSX Guide to Network Management Utilities* manual.

The CFE command LIST NODE *node-id* is enhanced to allow you to enter the wildcard character (*) in the area and/or number fields of the node address. For example, *.* specifies all nodes in all areas, *n*.* specifies all nodes in area number *n*, and *.*n* specifies all areas that have a node address of *n*. When the node information displays, enter `CTRL/C` to abort the output.

2.7.6.1 CFE Error Messages

The following error messages have been added to CFE for errors you might encounter during a Node Name Server request:

Node Name Server QIO directive failed, \$DSW=*dec*

This error is displayed whenever the QIO directive issued to NNS fails. The Directive Status Word, *dec*, is a decimal value which indicates the exact nature of the failure.

Node Name Server QIO returned wrong length, expected=*exp*, received=*rec*

This error displays after an NNS QIO completes successfully, but the I/O status block indicates that the server returns a different amount of data than expected. The amount expected displays in *exp* and the amount received displays in *rec*.

Node Name Server QIO failed, Function=*func*, I/O Status=*sts*

This error displays whenever the QIO issued to NNS completes with an error. The function, *func*, will be one of the NNS function codes IO.WND, IO.RND, IO.RMD, IO.DND, IO.OST, IO.CST, or IO.CCX. The I/O status code, *sts*, displays as an octal value and will be either an RSX standard I/O status error or an NNS function code described in Section 1.5.

Node Name Server assign LUN failed on device NN0:, \$DSW=*dec*. Node Name Server requests will not be performed

If CFE is used to modify an RSX-11M-PLUS CETAB.MAC on a system which does not support the node name service, or if the NN: driver is not loaded the assign LUN directive to the NN0:, the device will fail. The reason for failure is described by the directive status word, *dec*. Since this is only a warning message, you can still use CFE to modify the non-volatile database.

2.8 Utility Notes

2.8.1 CFE

This section belongs in the *DECnet-RSX Guide to Network Management Utilities* manual, Section. 1.1.

If you have a very large CETAB.MAC you may get the "CFE—Insufficient Buffer Space" error while CFE is attempting to read in the CETAB.MAC. If this happens, run or install CFE with an increment large enough to fit your CETAB. Refer to the *RSX-11M/M-PLUS MCR Operations Manual* for details about the RUN and INS commands.

2.8.2 NCP

The following sections belong in the *Guide to Network Management Utilities* manual, Section. 1.2.

NCP allows you to change, override, or delete the down-line load parameters in the volatile network database.

You can set and clear up-line dump parameters with NCP.

DECnet-RSX parses all NCP commands, except those that are system-specific to non-RSX systems. When DECnet-RSX does not support a command, NCP fails with the message "*command failed—invalid message format.*" These commands are parsed so that the local node may be used as a network control center. For example, TELL *ums-node* SHOW SIGNIFICANT NODES COUNTERS will be parsed and passed to the named node. If the remote node supports the command, it will be executed there; any messages will be displayed on the originating terminal or written to the specified local file.

The Phase II node name delimiter "_" (underscore) is no longer a valid node name delimiter. It can now be used in passwords and in the RSX-specific form: *NODE/user/password::*. Also, NCP no longer converts characters within quoted strings to uppercase. This allows better communication with systems that require case-sensitive passwords.

Alias user name and password size have been extended to 39 characters.

2.8.3 NFT

The following information belongs in the *DECnet-RSX Guide to User Utilities* manual, Chapter 4, Section 4.2.

Multiblock support has been added to both NFT and to the RMS FAL in order to improve the performance of block file transfers between RSX systems. This feature reduces both the number of disk accesses and the number of DAP data messages that must be processed during a file transfer in block mode. Note that only single-block transfers will be done against RSX and VMS systems that are running DAP V7.0 or earlier.

NFT now supports 39-character passwords, user names, and accounts.

When reporting problems with NFT, adding a DAP message trace of your particular problem will help us isolate the problem quickly. Please submit trace output with any NFT-related SPR. NFT must be rebuilt to enable message tracing.

To add trace support, modify [137,24]DECPRM.COM to change \$DNFTR to true and then rebuild NFT using the NETGEN component mode.

To activate tracing, assign the TR: logical device name to the desired trace, using the ASN *ddnn:=TR:* command.

If the trace output device is a disk, the output will be placed in the file NFARS.TRC under the current UIC.

2.8.4 FAL

The following information belongs in the *DECnet-RSX Guide to User Utilities* manual, Section 4.

There are two versions of FAL: one supports basic sequential FCS file access and can be made into a subset for use on RSX-11S nodes, and one supports RMS-11 file access.

FAL allows network file access only to or from public devices. If a device is to be accessed by a remote user, using either NFT, FTS, or any task which is linked to the NFARs, the device must be made public. To make a device public, use the SET /PUB=*dduu*: MCR command before mounting the disk. Note that magtapes can be set public but must be mounted for use by a single user. Since FAL cannot mount the tape, magtapes cannot be accessed by FAL.

FAL can provide logging of file accesses. To enable logging, you must provide the empty file LB:[1,4]FAL.LOG. If this file exists, FAL makes an entry in it for each file access request. The system manager should ensure that the file is emptied often enough so that it does not grow too large.

When reporting problems with FAL or NFT, a DAP message trace of your particular problem will help isolate the problem quickly. Please submit trace output with any FAL-related SPR. FAL must be rebuilt to enable message tracing.

To add trace support, modify [137,24]DECPRM.COM to change \$DFLTR to true and then rebuild FAL using the NETGEN component mode.

To activate tracing, assign the FT: logical device name to the desired trace, using the ASN *ddnn*:=FT:/GBL command.

If the trace output device is a disk, the output will be placed in the file [1,4]FAL.TRC.

The FCS-11 based FAL does not support random record access, relative or indexed files, stream files, and VFC files with fixed record headers whose header length is not equal to 2. It also does not support the rename, change protection, or block mode transfer features of NFT.

If the RMSRES version of FAL is improperly installed, it will abort (T-BIT TRAP or BPT EXECUTION) during file transfer. The following is a list of the correct install commands:

```
INS LB: [3, 54]RMSRES. TSK/PAR=GEN/RON=YES
INS LB: [1, 1]RMSLBL. TSK/PAR=GEN/RON=YES
INS LB: [1, 1]RMSLBB. TSK/PAR=GEN/RON=YES
INS LB: [1, 1]RMSLBC. TSK/PAR=GEN/RON=YES
INS LB: [1, 1]RMSLBD. TSK/PAR=GEN/RON=YES
INS LB: [1, 1]RMSLBE. TSK/PAR=GEN/RON=YES
INS LB: [1, 1]RMSLBM. TSK/PAR=GEN/RON=YES
```

NOTE

RMSRES is installed from [3,54]. There is also a file [1,1]RMSRES.TSK, that is not used by the RMS based FAL.

2.8.5 NFARs

The following information belongs in *DECnet-RSX Programmer's Reference Manual*, Section 3.9.

This release includes extended access control information size to the network file access routines (NFARs).

You may wish to use the DAP trace module to remove errors in user programs that use the NFARs. To add trace support, explicitly include in the task image the NFATRC module from the DAPTRC object library. The reference to NFATRC must come before any references to the DAPFOR library in the task build command file. Also, you must add the following line to the options in the taskbuild file:

```
GBLDEF = $TRLUN:6
```

To activate tracing, assign the TR: logical device name to the desired trace device. If the trace output device is a disk, the output will be placed in the file NFARS.TRC under the current UIC.

2.8.6 CTERM

The following information belongs in the *DECnet-RSX Guide To User Utilities* manual, Section 6.

Note the following when using CTERM:

- The character size for a CTERM session is now set in the following manner:
 - Before setting host, set the terminal driver character size. For example, to set eight bit mode, issue the MCR command SET /EBC=TI:.
 - If necessary, set the terminal controls that are appropriate to the character size that you selected in the prior step.
 - Set host.

The character size may not be altered for the duration of the CTERM session.

- VMS treats the ESCAPE control-key differently than RSX. When a VMS system sends an ESCAPE to an RSX system, the RSX system does not recognize it as a terminator. You can prevent this by setting NOLINEEDIT on the VMS system before connecting to the RSX system.
- VMS-style command line editing and recall are not supported between VMS and RSX systems. When you SET HOST from an RSX to a VMS system, the UP ARROW, DOWN ARROW, and certain other control-key sequences such as `CTRL/A` and `CTRL/E` cannot be used to perform VMS-style command editing. Due to the way VMS handles command line recall, one level of command line recall is available, in both directions, by using the UP ARROW and DOWN ARROW keys or by entering `CTRL/B`.

RSX does not support command line editing or recall; therefore neither function can be performed when you SET HOST from RSX to RSX.

- Certain control characters may echo differently when using CTERM from a VMS system to an RSX system than on a local RSX system. For example, `CTRL/Z` echoes as `<EXIT>`.
- There may be some screen formatting differences between using NCT from an RSX system to a VMS system and using a local VMS terminal. These differences do not affect EDT or screen display programs, but may affect read-with-prompt operations.
- VMS applications using FMS or TDMS to do screen I/O are not supported using CTERM from an RSX system.
- Before this release, when setting host to an RSX system from a different type of operating system (VMS, RSX, or other), the following message appeared at the beginning of the session:

```
Connected to "xxxxxxx", System type = RSX-11M-PLUS
System ID: xxxxxxxxxxxxxxxxxxxx
```

For security reasons, this message is changed to:

```
Connected to "xxxxxxx"
```

- The following CTERM problem occurs when running RSX-11M-PLUS V4.2 or Micro/RSX V4.2. RSX-11M-PLUS V4.3 or Micro/RSX V4.3 solves this problem.

When setting host from a terminal which does not recognize the inquire escape sequence, ESCAPE Z, the SET TERMINAL /INQUIRE and SET /INQUIRE=TI: commands hang. To work around this problem, press the Return key after the command hangs.

2.8.7 RMT

2.8.7.1 Use of RMT from Command Files

The following information belongs in the *DECnet-RSX Guide To User Utilities* manual, Section 7.

Avoid invoking the RMT utility from an indirect command file or batch job. The results are unpredictable and depend on the system and the timing involved.

2.8.7.2 Terminal Characteristics

When using RMT, the characteristics of your terminal depend on two things:

- The local node's terminal driver features
- The local device characteristics, as set by the MCR SET command prior to the RMT session

Optional features not supported at the local node are generally not supported during the RMT session. However, certain characteristics (ANSI, DEC, AVO, EDT, BLK, RGS and SFC) can be set on a remote host, even when the local host does not support them. These characteristics are implicitly set according to the RMT user's local terminal type. The terminal type at the start of the RMT session determines these characteristics for the session; however, the user can change characteristics by changing terminal types during the session.

2.8.7.3 Aborting RMT

DECnet-11M-PLUS systems allow the aborting of the Remote Terminal task (RMTACP) through an Executive feature.

RSX-11M and RSX-11S systems do not include this feature, and it is possible for a privileged user to abort RMTACP while it is in use. If RMTACP or any other privileged task is aborted, the system data structures may be left corrupted. If this occurs, a user connected through RMT can

enter a line of random characters. This invokes RMTACP again and resets the user's terminal to its original state.

If RMTACP is aborted, do not remove it from the system until all terminals are reconnected to the local system. Prematurely removing RMTACP after an abort may lead to a system crash.

2.9 Local Area Transport (LAT) Support

The following information belongs in the *DECnet-RSX Guide To Network Management Utilities* manual, Section 5.

2.9.1 Increase in the Number of LAT Terminals

The maximum number of LAT terminals is increased to 128 for DECnet-Micro/R SX and DECnet-11M-PLUS I/D systems. The maximum number of LAT application terminals is 31.

2.9.2 Additional SHOW PORT Information

This section provides information about the SHOW PORT command that is not presently covered in the documentation set.

2.9.2.1 SHOW PORT TTnn: Command

You can use the SHOW PORT TTnn:command (where TTnn: is a specific terminal) to display information about a single terminal. When an application terminal is specified, /FULL information is displayed. The following example shows a sample command and display.

>

LAT Interactive Terminals:

Terminal	Local Port	User Name	Server Name	Server Port Name
TT30:	PORT_1	S. DAVIS	GROTON	PORT_7

2.9.2.2 SHOW PORT TTnn: Error Messages

The following error messages are defined for the SHOW PORT TTnn: command.

LCP — Device specified is not a valid LAT device

The specified device is not a LAT terminal or is not a valid device name.

LCP — Device not active

The device is available for an interactive session or for use as an application terminal if set up by LCP or a user program.

2.9.2.3 SHOW PORT /APP Display Parameters

The LCP SHOW PORT command displays detailed information about LAT application terminals, including server (Ethernet) address, last status, and last error. Individuals such as Digital Field Service specialists and network managers use this detailed information for correcting errors and problem determination.

The following example shows a sample SHOW PORT command and display. Descriptions of the new parameters follow the example.

```
>
LAT Application Terminals:
Terminal  Local Port  Server Name      Service Name      Server Port Name
TT47:    PORT_26      SERVER1          None Provided     PORT_2
Status:  Not Connected      Flags: RSV
Connect Requests: 532      Requests Retransmitted: 3
Connect Request Failures: 1  Server Address: 08-00-2B-02-ED-B7
Last Status Received: 0    Last Error Received: 0
```

- **The Server Address** parameter is the Ethernet address, and is the first parameter with which the terminal server responds to a connect request initialization. The Server Address parameter is always returned, even if the requested port or service is unavailable or does not exist.

The Server Address parameter is set to 00-00-00-00-00-00 when a LAT terminal is initialized or when the target node (terminal server, port, or service) information is changed. The address remains at this setting until the terminal server has returned this parameter as a result of a connection solicitation.

- **The Last Status Received** parameter is used by Digital Field Service specialists and others involved in correcting network problems. The Last Status Received parameter contains the last entry status that was received from the terminal server as the result of a connection solicitation sequence. This value is usually 0. A value of 200 indicates that an error has occurred during the connection solicitation. If the value is 200, the Last Error Received parameter should contain an error value.

- **The Last Error Received** parameter is used by Digital Field Service specialists and others involved in correcting network problems. This parameter contains the numerical value returned by the terminal server when the Last Status Received parameter is 200. The value contained in the Last Error Received parameter is translated to one of the LAT error codes described in the *DECnet-RSX Programmer's Reference Manual*. In some cases, more than one parameter value is translated to the same LAT error code.

The following list shows the parameter value codes that may occur when a connection solicitation is rejected (Last Status Received = 200).

Code	Meaning
0.	Reason is unknown
1.	User requested disconnect
2.	System shutdown in progress
3.	Invalid slot received
4.	Invalid service class
5.	Insufficient resources to satisfy request
6.	Service in use
7.	No such service
8.	Service is disabled
9.	Service is not offered by the requested port
10.	Port name is unknown
11.	Invalid password
12.	Entry is not in the queue
13.	Immediate access rejected
14.	Access denied
15.	Corrupted solicit request
16.	COMMAND_TYPE code is illegal/unsupported
17.	Start slot cannot be sent
18.	Queue entry deleted by local code
19.	Inconsistent or illegal request parameters

2.9.3 New LCP Error Messages

There are several new error messages added which relate to the creation and deletion of the common data region. The list of these error messages follows:

- **Number of terminals exceeds maximum** - This error displays when the command LCP CREATE/TERM=*n* exceeds the maximum value allowed. Support exists for only 64 terminals on a non-I/D space system, or 128 terminals on an I/D space system.
- **NT.LA2 data space region not loaded** - This error displays when the data region can not be created. It will be preceded by one of the other messages described in the following text which indicates the exact reason for the region not being loaded.
- **Main partition GEN not found** - Since the data region is only supported on RSX-11M-PLUS operating systems with I/D space support, LCP always expects the GEN partition to exist (where all other processes are loaded) and attempts to load the data region into this main partition. This error displays if the GEN partition could not be located while searching the partition list.
- **NT.LA2 PCB DSR allocation failed** - This error displays when the call to the Executive routine (\$ALOCB) returns an error while trying to allocate a Partition Control Block (PCB) for the NT.LA2 subpartition.
- **No memory available in partition** - This error displays when LCP is unable to find a contiguous chunk of memory in the GEN partition large enough for the NT.LA2 subpartition that it is attempting to create. Under usual circumstances this will not happen if the LAT process is loaded and started at boot time. If it does happen, memory will have to be released by removing other tasks and/or commons from the GEN partition.
- **NT.LA2 common already installed** - This error displays when LCP detects the NT.LA2 common already being loaded before attempting to create the data region. Since the LAT process is not loaded when this routine is called, either the LAT process did not successfully delete the common when the process was cleared by NCP/NTL, or the region was inadvertently left existing after an unsuccessful load by NTL.
- **Common region NT.LA2 not found** - This error displays when LCP attempts to delete the data region after detecting an error from NTL after requesting the loading of the LAT process. This error indicates LCP could not locate the NT.LA2 data region which it created prior to requesting NTL. This is the only time LCP attempts to delete the data

region since the LAT process is expected to delete the region at process termination time.

2.10 Cross-System File Transfer Notes

2.10.1 RSX-11M/M-PLUS File Transfer Capabilities

Support of the DAP Rename operation is currently limited to the RMS-11 based FAL and RSX based 11M/M-PLUS NFT utilities.

Support of the DAP Change Protection operation is currently limited to the RSX based 11M/M-PLUS NFT utility, and to the 11M/M-PLUS and VMS RMS based FAL utilities.

Neither the RMS-11 based nor the FCS-11 based 11M/M-PLUS FAL will support the FOP delete-on-close option bit in combination with the spool-on-close option. The file will be spooled but not deleted.

2.10.2 VMS File Transfer Capabilities

VMS supports a transparent remote file access interface integrated with the RMS file system. For more information, see the VMS VAX-11 RMS manuals and Cross System Notes. The VMS FAL supports most of the capabilities of VAX-11 RMS.

Wildcard transfers from VMS to RSX-11M nodes may result in errors. These errors occur because VMS has decimal file-name version numbers while RSX-11M supports octal file-name version numbers. See the previous NFT section for details.

Many text files on VMS systems use the print file carriage control attribute (RAT=PRN). In particular VMS batch log files and files created by VMS DCL default to print file carriage control. This is now a supported record format for the 11M/M-PLUS RMS-11 based FAL, but not for most RSX text editors and utilities. Users must be careful when transferring files from a VMS system to an RSX system. If the file is to be used on the RSX system, it must be converted by the RMS Convert utility.

11M/M-PLUS and VMS have differing meanings for the E protection category. On RSX, E means "extend" file access. On VMS, it means "execute" (run) file access. Files transferred to a VMS system will lose the "extend" setting and gain the "execute" setting. Files transferred from a VMS system will lose the "execute" setting and gain the "extend" setting.

Space for VMS files is always allocated according to the cluster size of the disk. When the VMS COPY command transfers files from a VMS system to an RSX system, the extra blocks allocated due to cluster round-up will not be truncated. When this happens, you can truncate the file on the RSX node, using the PIP *file/TR* command. RSX task image files transferred from a VMS system must especially be truncated, because the INSTALL command on the RSX system will not install a file whose high block is not the same as the end-of-file block.

The VAX-11 RMS file system supports a superset of the RMS-11 V2.0 capabilities. Some capabilities are suppressed or modified by the VAX-11 RMS network access code when working against an RSX system, and some are not. See the *VAX/VMS Cross System Notes* for more detail. In particular the following capabilities or attributes are not supported by the RSX RMS-11 based FAL:

- Stream-CR or Stream-LF Record Format (RFM) types.
- The Contiguous-Best-Try Allocation option (FOP or AOP = CTB). VMS suppresses this option.
- Numerous FOP options including Truncate-On-Close.
- Prologue Version 3 indexed sequential files. You must use CONVERT to change the file to Prologue Version 1 or 2.
- \$RELEASE and record locking: RMS-11 V2.0 supports bucket level locking only.

2.10.3 RSTS DECnet/E V2.0 File Transfer Capabilities

RSTS now supports an RMS-11 based FAL and NFT. For information on the RSTS DAP utilities, consult the *RSTS DECnet/E Guide to User Utilities* and the *RSTS DECnet/E Release Notes*.

Most text files on RSTS systems are in Stream ASCII record format. This is now a supported record format for the 11M/M-PLUS RMS-11 based FAL, but not for most RSX text editors and utilities. Users must be careful when transferring files from an RSTS system to an RSX system. RSTS NFT will translate stream ASCII files into variable length record format if the /VA switch is specified. RSX NFT will translate variable length record files into stream ASCII if the /AS switch is specified.

RSTS NFT cannot copy sequential files in block mode from an RSX RMS-11 based FAL that have an FFB value of other than 0 or 512. RSTS RMS-11 currently restricts block I/O writes to units of 512 bytes. Such sequential files must be transferred in record mode.

The RSTS FAL only supports block mode transfer of indexed files.

2.10.4 RT-11 V2.0 File Transfer Capabilities

The RT-11 FAL supports only sequential files and a basic set of file operations. For more information see the *RT-11 DECnet Guide to User Utilities* and the *RT-11 DECnet Release Notes*.

Most text files on RT-11 systems are in Stream ASCII record format. This is now a supported record format for the RSX-11M/M-PLUS RMS-11 based FAL, but not for most RSX text editors and utilities. Users must be careful when transferring files from an RT-11 system to an RSX system. RT-11 NFT will translate stream ASCII files into variable length record format if the /AS switch is specified. RSX NFT will translate variable length record files into stream ASCII if the /AS switch is specified.

The RT-11 FAL does not support the following:

- Relative and Indexed file organizations
- Variable and VFC record formats
- FORTRAN and Implied LF/CR record attributes

2.10.5 IAS V3.0 File Transfer Capabilities

The IAS FAL is FCS-11 based and supports only basic FCS file transfer services. It is essentially the same as the RSX-11M DECnet V3.1 FAL.

The IAS NFT is essentially the same as the RSX-11M/M-PLUS NFT, but without the new features.

2.10.6 TOPS-20 File Transfer Capabilities

The TOPS-20 FAL supports only sequential files and a basic set of file operations. For more information see the *TOPS-20 DECnet Guide to User Utilities* and the *TOPS-20 DECnet Release Notes*.

Most text files on TOPS-20 systems are in Stream ASCII record format. This is now a supported record format for the 11M/M-PLUS RMS-11 based FAL, but not for most RSX text editors and utilities. Users must be careful when transferring files from a TOPS-20 system to an RSX system. TOPS-20 NFT will translate stream ASCII files into variable length record format if the /AS switch is specified. RSX NFT will translate variable length record files into stream ASCII if the /AS switch is specified.

TOPS-20 does not support the following:

- Relative and Indexed file organizations
- Fixed, Variable and VFC record formats
- FORTRAN and Implied LF/CR record attributes
- Random record and Block I/O access modes

2.11 Installing a DECnet Router Server

During DECnet Router Server installation, the installation procedure looks for the account program (ACNT) in [1,54] when you answer YES to the question "Do you need to run the Account program?" With DECnet-11M-PLUS V4.0 systems, the account program (ACNT) resides in [3,54]. Because of the change in location, if the PLUTO account and UIC [40,40] do not exist you should run the RSX account program **before** you install the DECnet Router Server to create the correct account and directory.

2.12 Unsupported Software

The UFD [200,200] on the distribution media contains Unsupported Software provided by Digital as a courtesy to customers. These utilities are **not** supported by Digital Equipment Corporation.

Invoke the file [200,200]UNSGEN.CMD on the distribution disk to generate all unsupported software.

2.12.1 Communication Executive Database Dump (CEDUMP) Program

The CEDUMP utility dumps the internal data structures in formatted text. This utility is **not** supported by Digital, but is provided for use by Digital Software Specialists and as a courtesy to our customers.

CEDUMP functions are controlled by switches. There are three types of switches:

- General
- Comm/Exec
- DECnet

The following sections list the switches in these categories.

2.12.1.1 General CEDUMP Switches

For ease of use, two switches of general use for all Comm/Exec-based communications products are provided:

/HE List the CEDUMP switch descriptors

The switches listed by the /HE switch are the valid switches at the time the /HE switch is invoked. For instance, if a DECnet system is available but not currently active (Executor state = ON), the DECnet-specific switches will not be listed.

/AL Dump all available data structures

The data structures that the /AL switch will dump depend on the support built into the program at generation time and on the state of the network software when the switch is invoked. For instance, if the Comm/Exec is not loaded (through SET SYSTEM), no data structures will be dumped.

2.12.1.2 Comm/Exec CEDUMP Switches

The following switches dump the basic network data structures (those present for all products layered upon the Comm/Exec).

/CM Dump the Comm/Exec Common Database

/FR Dump the Free Resource List Status

/LT Dump the DLC/DDM Process Line Tables and LLC Databases

/NL Dump the Network Loader Information

/PD Dump the Process Descriptors

/PO Dump the Pool Statistics

/RV Dump the Reverse Mapping Table

/SL Dump the System Line Table

2.12.1.3 DECnet CEDUMP Switches

The following switches dump the DECnet-specific data structures.

/DH	Dump the DECnet Home Block
/GE	Dump the DECnet General Delivery Queue
/IO	Dump the NETACP I/O Queue
/LI	Dump the Active Line Count
/LL	Dump the Logical Links
/LN	Dump the Physical Link Blocks
/MB	Dump the DECnet Mailbox Queue

2.13 Network Loading Hints for Systems with 512KB

The following information belongs in the *DECnet-RSX Network Generation and Installation Guide* manual, Section 9.

If the NTL error message "Partition too fragmented" occurs during network loading, this indicates that the GEN partition does not contain enough available memory for loading the network. If this error occurs, you must tailor your system to make more memory available.

After the initial attempt to load the network fails, you should use the following series of commands (depending upon your system) to remove the AT. task and retry the loading procedure:

```
REM AT.  
NCP SET EXEC STATE OFF  
NCP CLEAR SYS  
NCP SET SYS  
NCP SET EXEC STATE ON  
LCP START (for RSX-11M-PLUS and Micro/R SX systems with Ethernet support)  
INS LB:[3,54]ICM (for RSX-11M-PLUS systems)  
INS LB:[3,54]ICMRES (for Micro/R SX systems)  
INS LB:[1,54]ICP (for RSX-11M systems)
```

If the network loading still fails after using the preceding commands, you must remove other tasks from GEN. Once you have successfully loaded the network, you can reinstall the tasks that you removed.

In the *DECnet-RSX Guide to Network Management Utilities* manual, on page 1-62 after the table entry for **MINIMUM RECEIVE BUFFERS number**, insert the following:

POOL BLOCK-AREA *block-count*

Specifies the number of statically allocated UMR-unmapped blocks of 32 words each.

HOW TO ORDER ADDITIONAL DOCUMENTATION

DIRECT TELEPHONE ORDERS

In Continental USA
call 800-DIGITAL

In Canada
call 800-267-6215

In New Hampshire
Alaska or Hawaii
call 603-884-6660

In Puerto Rico
call 809-754-7575 x2012

ELECTRONIC ORDERS (U.S. ONLY)

Dial 800-DEC-DEMO with any VT100 or VT200
compatible terminal and a 1200 baud modem.
If you need assistance, call 1-800-DIGITAL.

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Nashua, New Hampshire 03061

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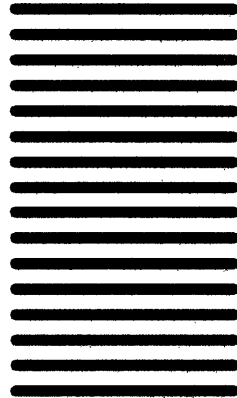
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