Networks · Communications

DECnet–RSX

Release Notes

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DECnet–RSX

Release Notes

Order No. AA–J517D–TC

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DECnet–RSX Release Notes inform the user of updated information not included in the manual set. This information covers software and/or documentation errors or changes made late in the development cycle, plus installation and operation information. This manual should be read before others in the manual set.

Supersession/Update Information: This is a new manual.

Operating System and Version: RSX–11M V4.2
RSX–11S V4.2
RSX–11M–PLUS V3.0
Micro/RSX V3.0

Software Version: DECnet–11M V4.2
DECnet–11S V4.2
DECnet–11M–PLUS V3.0
DECnet–Micro/RSX V1.0

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CONTENTS

1.0 Release Description

These are the *DECnet-RSX Release Notes* for DECnet-11M/S V4.2, DECnet-11M-PLUS V3.0, and DECnet-Micro/RSX V1.0. This release supports hierarchical routing, heterogeneous command terminals using the CTERM protocol. This release also supports host support for LAT-based terminal servers for DECnet-11M-PLUS and DECnet-Micro/RSX only.

NOTE

> This kit must be generated and run only on RSX-11M/S V4.2, RSX-11M-PLUS V3.0, Micro/RSX V3.0 or VMS V4.0 systems with VAX-11 RSX V2.0. DECnet and PSI kits distributed on magnetic tape or RL01s contain identical NET kits. Therefore, users who have ordered both DECnet and PSI software will receive two NET kits, either of which can be used.

1.1 New Features

The following items are the major new features in this release:

o **Hierarchical (area) routing.** This feature allows the network to be divided into a number of areas with a maximum of 63. A detailed explanation of area routing can be found in the *DECnet-RSX Network Management Concepts and Procedures* manual.

o **Heterogeneous command terminal (CTERM) support.** This feature provides a virtual terminal connection to remote Phase IV DECnet systems which provide similar support. A detailed explanation of CTERM support can be found in the *DECnet-RSX Guide to User Utilities* manual.

o **Nonrouting node support for Micro/RSX.** DECnet-Micro/RSX V1.0 is a new product which allows Micro/RSX systems to participate in DECnet Phase IV networks as end nodes.

o **Streamlined NETGEN procedures.** The time required to generate the DECnet software has been reduced by prebuilding some of the DECnet tasks and processes.

o **LAT host support for terminal servers.** This feature allows terminals connected to LAT terminal servers to establish a virtual connection to an RSX-11M-PLUS or Micro/RSX host system.

o **TK50 distribution**.

o **Executive vectoring**. DECnet privileged tasks and
   processes take advantage of the RSX11-M-PLUS and
   Micro/RSX executive vectoring feature. This allows
   privileged tasks to be transported between like systems.
   It also means that it is not necessary to rebuild the
   network if a new SYSGEN has been performed. The device
   drivers DU, DUV, and PCL have not been vectored. If
   these devices are included in the network, it is
   necessary to do a NETGEN when a new SYSGEN is formed.

Following are the major features in this release:

o Utility to interpret binary event logging file (EVF)

o DCL support for NFT and EVF

o NFT/FAL named directory and decimal version number
   support

o Ability to modify down-line load parameters (SET/CLEAR)
   with NCP

o DHU/DHV comm device support

o PHONE is a supported utility

2.0 Reporting and Isolating Problems

2.1 Reporting a User Problem

A separate Software Problem Report (SPR) should be used for each
problem. This simplifies record keeping for quick responses.

User problems are often difficult to reenact. In an SPR, please
describe the system state when the problem occurred. Keep the
description simple and accurate. Illustrate a general problem
with several examples. When an SPR contains concise information
about a problem, the problem is easier to reenact and correct.
Please ensure that questions are direct and simple.

2.2 Investigating and Correcting Serious Errors

This section contains information that should be used for both
isolating problems and reporting problems to Digital.

To investigate and correct problems such as system hangs or crashes, the following information is essential:

- o A description of the events leading to the problem

- o Console dialog or output, if appropriate

- o A machine-readable copy of:

    - o Crash dump file

    - o RSX symbol table file (RSX11M.STB) M-PLUS only

    - o CEX symbol table file (CEX.STB) 11M/S only

    - o CEX database file (CETAB.MAC)

    - o Any user task involved (source copy)

    - o The task build command files or parameters used at NETGEN for the appropriate network tasks involved

    - o The task build map files created during NETGEN for the appropriate network tasks involved

    - o Suggestions for problem isolation

NOTE

If the problem is device related, the modem or type of local connection being used must be identified.

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

If the problem occurs when the network is running and the software that does not use the network is involved, unload the network software and try to reproduce the problem without the software.

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.

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 Reporting a Documentation Problem

When describing a problem in a manual, specify the full title of
the manual and identify the appropriate section, table, and/or
page number.   Describe what the manual says and suggest a
correction.

3.0 Documentation Errors

This section describes information that is documented incorrectly
in the DECnet-RSX V4.2/3.0 manual set.

The SHOW LINE section of RSX-11S NCP command summary in the
DECnet-RSX Guide to Network Management Utilities states that the
commands SHOW LINE *line-id* SUMMARY and SHOW LINE *line-id* STATUS
will work when locally initiated. These commands will only work
when given from a remote node.   The command SHOW LINE *line-id*
COUNTERS is the only local command valid for lines on DECnet-11S
systems.

4.0 NETGEN Notes

On RSX-11M-PLUS systems, the slow task builder is no longer
required for NETGEN to build any network tasks. NETGEN will not
function properly if you use the small indirect command processor.

When tasks are linked to one of the FCS resident libraries, the
three letter mnemonic corresponding to the resident library
selected during NETGEN is appended to the task name. For example,
if FCSRES is selected, the task name for CFE is CFERES.TSK. If
FCSFSL is selected, the task name is CFEFSL.TSK. The three letter
mnemonic is only appended to the tasks which are linked to the
resident libraries.

4.1 Prerequisites

This release of DECnet-RSX will run on an RSX-11M/S Version 4.2
system, an RSX-11M-PLUS Version 3.0 system, or a Micro/RSX Version
3.0 system. It will not run with earlier versions of the RSX
systems.   The NETGEN is also intended to run with these versions
of the RSX-11M/M-PLUS and Micro/RSX software and will not generate
properly with earlier versions of the RSX operating system. This
includes earlier versions of TKB and MAC.

Saved response files from DECnet-11M Version 4.0 can be used with DECnet-RSX-11M Version 4.2. Saved response files from DECnet RSX-11M-PLUS Version 2.0 can be used with DECnet-11M-PLUS Version 3.0. When using saved responses from a previous release, certain sections may be automatically repeated to obtain information not provided by the previous release saved responses.

4.2 Micro/RSX

The TK50 distribution for DECnet-Micro/RSX consists of 1 tape. The tape contains the same 3 kits that the 9 diskettes contain. When you invoke OPTION.CMD with this tape, you can install either DECnet, DECNETAPO or DECNETSSC. The default for event logging for DECnet-Micro/RSX is File Event Logging.

5.0 Pregenerated M-PLUS Systems

5.1 System Selection

On the RSX-11M-PLUS pre-SYSGENned distribution kit, there are two system images. Before doing a full NETGEN you should use the procedure provided with the RSX-11M-PLUS distribution kit to delete the system that you will not be using. If you do not use the procedure that was provided, there may be some libraries left on your target disk that should not be there and NETGEN may give you the option of using them (for example, supervisor mode FCS library).

5.2 Processor Type in RSXMC.MAC

It is no longer necessary to modify the processor type in RSXMC.MAC. NETGEN allows any device to be generated during NETGEN which allows for portability of systems between UNIBUS and QBUS systems.

5.3 Startup File Customization

The RSX-11M-PLUS pregenned system that supports only instruction space now comes with a startup file that deallocates the Communications Executive (CEX) space in the executive, unless the file LB:[1,2]SYSPARAM.DAT is modified. You must change the line

in this file from DECNET=NO to DECNET=YES and reboot the system before you can load your network software.

The startup file then displays:

> Step 2 - Deallocating DECnet communications executive
> System configuration includes DECnet

If the second line is displayed as shown, the CEX space has not been deallocated.

5.4 Device Questions

NETGEN questions 3.01, 3.02, 4.03, and 4.04 ask about device CSR and vector addresses. Typically, each device has several device registers and vector addresses associated with it. `You must specify the lowest device register and vector address when answering the questions. This is also true when specifying CSR and vector addresses to NCP, CFE, or VNP.

NETGEN question 2.04 asks for the line speed for the device. The speed of a synchronous line is determined by the modem. The line speed specified in NETGEN is used to calculate timing criteria for the line and buffer requirements. If the line speed specified is incorrect, the timing will be incorrect and the large data buffer allocation may be incorrect. If the line speed is set higher than the actual line speed, there may be errors on large data blocks or there may be allocation failures of large data buffers. Errors on large data blocks usually appear as data CRC errors. If the actual line speed is higher than the specified line speed, there is a long delay on timeouts. Use CFE to reset the specified line speed if the modem speed is changed.

NETGEN question 4.02 asks if the device is a DL11-E. You should answer this question NO if your DL11 or DLV11 is any one of the following:

>   DL11-A,
>   DL11-B,
>   DL11-C,
>   DL11-D,
>   DL11-WA,
>   DL11-WB,
>   DLV11-F
>   DLV11-J

The *DECnet-RSX Network Generation Manual* lists the PCL as a supported device for the pregened end node. The PCL is not a supported device for the pregened end node. None of these specified devices support the Clear to Send (CTS) signal.

NETGEN questions 4.05 and 4.06, in NETGEN Section 3, ask about modem signal monitoring and whether or not the modem switches carrier with Request to Send (RTS). Bell 202 modems (or their equivalents) provide this. If the device is a DL11-E or a DLV11-E, and the modem provides switch carrier with RTS, you should answer NO to question 4.05. Answering YES would require the monitoring of Data Set Ready (DSR), and this signal is not available from the DL or DLV device. If the modem does not switch carrier (such as the Bell 103 or the Bell 113), you may answer YES to question 4.05, since Carrier (CAR) will be monitored, and this signal is available from the DL or DLV device.

If these questions are both answered YES for a DL or DLV device, NETGEN will reset the answers to NO automatically.

5.5 Swapping NETGEN Input Disks

Question 1.00 in NETGEN Section 9 asks for the object disk device for the next CEX product to be built, such as DECnet or PSI. If you plan on using a disk drive which currently contains another disk, do not replace the disk until you have typed the <RET> to question 1.00. At this point, question 1.01 asks if the disk is ready. You may now change disks, and, when the proper disk is spinning and ready, type YES to question 1.01.

Following this procedure guarantees that NETGEN dismounts the first disk before the second disk is accessed. If the second disk is spun up before NETGEN checks to see if the first disk should be dismounted, a disk directory problem could result. FCS may indicate that some of the files NETGEN requires are on the disk, while not finding others. This causes NETGEN to attempt using the disk without dismounting and remounting it, and causes the build procedures to fail.

5.6 Post NETGEN Suggestions

For RSX-11M/M-PLUS systems, before bringing your network up using the MCR command file NETINS.CMD, you may first set the network UIC, using the VMR or MCR command SET /NETUIC=[x,54]. If you set the network UIC to the wrong UIC, NETINS.CMD will use that UIC and may load the wrong network.

5.7 Abnormal NETGEN Termination

If NETGEN terminates abnormally with an AT. error message, such as ...AT. -- File read error, or if it stops prematurely with an

end-of-file (@<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.

5.8   Generation on VMS Hosts

The VAX11-RSX V2.0 release on VMS V4.0 supports all of the
features necessary to perform a DECnet-11M, DECnet-11S, or
DECnet-11M-PLUS network generation. See *DECnet-RSX Network
Generation and Installation Guide* sections 3.3.6 and 4.2.2 for
more details.

When doing a PREGEN or a NETGEN on a VMS host, do not allocate the
disks before starting the procedure. Use the RSX syntax when
specifying a disk. Use the syntax DLO instead of DLAO.

6.0   Device notes

6.1   DEUNA/DEQNA

When running a UNA/QNA on a network with foreign devices, ignore
and disable event type 5.15. This is the result of the UNA/QNA
receiving a message larger than the buffer it has to put it in.
This is most often seen when sharing an Ethernet with a XEROX
system that sends a lot of broadcast messages.

6.2   DMP and DMV Multipoint Controllers

If you use a DMP or DMV device as a multipoint controller, there
are parameters that you should ensure are set properly. If these
parameters are not set properly, the performance of the line may
be degraded. For a complete description of these parameters,
consult the *DMP11 Synchronous Controller Manual* or the *DMV11
Synchronous Controller Technical Manual*.

Set the DEAD TIMER parameter using the following NCP commands:

```
>NCP SET LINE DMP-cnt DEAD TIMER msc
>NCP SET LINE DMV-cnt DEAD TIMER msc
```

Where

```
cnt        is the controller.
msc        is the dead timer value in milliseconds.
```

This may be calculated as follows:

```
         maximum delay in seconds before
         a node is recognized
1000     -------------------------------
         maximum number of dead tributaries
```

NOTE

For best results the dead timer should be set as
high as possible.

Set the DELAY TIMER parameter using the following NCP commands:

```
>NCP SET LINE DMP-cnt DELAY TIMER msc
>NCP SET LINE DMV-cnt DELAY TIMER msc
```

Where

```
cnt    is the controller number.

msc    is the delay timer value in milliseconds. This
       may be calculated as follows:

           0    for coax.
          50    for multipoint EIA lines.
         200    if any software implementations  of
DDCMP
              are on the multipoint line.
```

NOTE

If more than one value could apply, choose the
larger value.

You should also note that dead tributaries are always polled if
they are set ON.   If any tributaries are known to be in a dead
state, (either permanently or temporarily) for some significant
amount of time, it is suggested that they be turned off. This may

significantly improve performance for the tributaries that are truly on. To do this, use the following command:

>NCP SET CIRCUIT DMP-cnt.tri STATE OFF

Where

cnt   is the controller number.
tri   is the tributary number.

6.3 Powerfail Recovery

If a power failure occurs while a DMC-11 line is active, the DMC may corrupt memory before the network software is signaled of the recovery. This situation can cause the system to crash.

6.4 Error Counters

If a header CRC error occurs as a result of line interference, the Header Format Error and Buffer Too Small error counter flags may be incremented instead of the Header CRC Error. This is a result of the device drivers checking these conditions before calculating the header CRC.

6.5 Device CSRs for Down-line Loaded Systems

It is important to have the "floating" device CSRs at the proper addresses on the system to be loaded. The proper addresses are determined according to the standard UNIBUS and Q-BUS ranking of the devices, as when setting up the CSRs for a system which will auto-configure to determine the devices on the system.

A command file, [200,200]FLOAT.CMD, has been provided on the DECnet distribution kit to help you determine what these CSR addresses should be.

7.0 System Notes

7.1 System Pool Usage

The installation and operation of DECnet software can add significantly to the system pool usage, depending on user

requirements. To help in minimizing the system pool usage, a
general breakdown of pool requirements for various DECnet features
is given here.

Network parameters that use pool include:

> o Number of control buffers   17. words/control
>   buffer

> o Incoming network command   30. words/allowed link
>   terminal links   for HT: and RT:
>   driver
>
>   data structures

> o Maximum logical   2. words/allowed link
>   links allowed

> o Number of   21. words/circuit
>   circuits defined

Loading and starting the network can use a wide range of values of
system pool, depending on your specific system configuration.
During network load and start-up, control buffers and common areas
for DECnet processes are allocated.

When running network tasks, the first logical link adds 18. words
to pool usage and each additional logical link adds 11. words.
This does not include the pool required for any QIOs issued on the
logical unit.

7.2   Network Resource Problems

When running your system, periodically check the system counters
using the NCP SHOW SYSTEM COUNTERS command.

In many cases of apparent network problems, the difficulty can be
traced to insufficient network resources. If there are receive
buffer allocation failures, increase the minimum number of receive
buffers with the CFE DEFINE SYSTEM MINIMUM RECEIVE BUFFERS
command. Increasing the minimum number of receive buffers
effectively decreases the number of large buffers that can be used
for transit messages. Therefore, you may need to increase the
number of large buffers. Use the CFE DEFINE SYSTEM MAXIMUM LARGE
BUFFER command to increase the number of large buffers.

If there are large buffer allocation failures, increase the number

of large buffers with the CFE DEFINE SYSTEM MAXIMUM LARGE BUFFER command. Alternately, you can decrease the minimum number of receive buffers with the CFE DEFINE SYSTEM MINIMUM RECEIVE BUFFER command, since this will effectively increase the number of large buffers that can be used for transit messages. If you do this, however, watch for receive buffer allocation failures.

For further information involving receive buffer and large buffer allocation failures, see the *DECnet-RSX Network Management Concepts and Procedures* manual.

7.3 Tuning

When tuning your system, you should periodically check the system counters using the command NCP SHO SYS COU.

If there are allocation failures for receive buffers, increase the minimum number of receive buffers using the CFE command DEF SYS MIN REC BUF. You may also wish to increase the number of large buffers using the CFE command SET SYS MAX LARGE BUF, since increasing the minimum number of receive buffers will effectively decrease the number of large buffers that can be used for transit messages.

If there are allocation failures for large buffers, increase the number of large buffers using the CFE command DEF SYS MAX LARGE BUF. Alternately, you may decrease the minimum number of receive buffers, using the CFE command DEF SYS MIN REC BUF, since this will effectively increase the number of large buffers that can be used for transit messages. If you do this, however, you should then watch for allocation failures on receive buffers.

7.4 Powerfail Recovery

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

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 wish to clear the network from memory during SHUTUP, include the following in LB:[1,2]SHUTUP.CMD:

```
.IFINS LCP LCP STOP          (M+ only)
NCP SET EXECUTOR STATE OFF
.WAIT NETACP
NCP CLEAR SYSTEM
```

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Because the NCP command SET EXECUTOR STATE OFF completes asynchronously, immediate issuance of a CLEAR SYSTEM command causes the following error message to be displayed.

NTL -- Device NS: Still Active

To avoid this, .WAIT NETACP must be included.

8.0 Utility Notes

8.1 NCP, CFE, and VNP

Networks which do not include hierarchical routing will display all node numbers with the area 1 designation. Phase III nodes and Phase IV to Phase III compatibility are not affected by this change.

Named directories may not be used as the locations for the Logging File Component, which defaults to LB:[1,6]EVENTLOG.SYS. Named directories may not be used as the location for the output of the KMX-DUMP command, which defaults to LB:[1,6]PSIKMXMEM.SYS. Named directories may not be used as the location for the output of the PSI TRACE command, which defaults to LB:[1,6]PSITRACE.SYS.

8.2 CFE

If you have a very large CETAB.MAC you may get the error message:

CFE -- Insufficient Buffer Space

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. See the *RSX-11M/M-PLUS MCR Operations* manual for details of the RUN and INS commands.

8.3 NCP

NCP now allows you to change the down-line load parameters in the volatile network database. Parameters may be set or changed with the NCP SET NODE command, or the default parameters may be overridden when the NCP LOAD NODE, LOAD VIA, TRIGGER NODE, or TRIGGER VIA commands are given. The parameter values may be

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cleared with the NCP CLEAR NODE commands. These parameters are described in the *DECnet-RSX Guide to Network Management Utilities* and *Network Management Concepts and Procedures* manuals.

The up-line dump parameters may also be set and cleared with NCP. When a satellite node requests an up-line dump, the host node will look for these parameters in its remote node database if they are not supplied in the request. See the *DECnet-RSX Guide to Network Management Utilities* and *Network Management Concepts and Procedures* manuals for details.

Support has been added to NCP to allow it to change the executor parameters: Incoming Timer, Outgoing Timer, Inactivity Timer, and Retransmit Factor.

All NCP commands that are not system-specific to systems other than RSX are now parsed. When DECnet-RSX does not support a command, NCP will fail 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 *<VMS 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, and any messages or display will be shown 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 may 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.

Three special alias names are now allowed by NCP. These are $HOST, $LOCAL, and an alias name consisting of from 1 to 6 blanks. Any number of blanks in the valid range will map to the same alias.

8.4 VNP

The VNP command SET EXECUTOR STATE ON is illegal for RSX-11M and RSX-11M-PLUS systems. The reason for this restriction is that the operating system startup command procedure must establish checkpoint allocation space on disk before the network state is changed to ON. The NCP SET EXECUTOR STATE ON command should be added to the startup command file.

RSX-11M and RSX-11M-PLUS systems must be saved using the RSX SAVE command before the network is loaded with VNP.

Loading network software into a system image file with greater
than 124KW address space is supported for RSX-11S and RSX-11M-PLUS
systems only.

8.5 NFT

When reporting problems with NFT, a DAP message trace of your
particular problem will help 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.CMD to change $DNFTR
to true and rebuild NFT using the NETGEN component mode.

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

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

8.6 FTS

Each FTS job is scheduled by sending one or more user request
block (URB) files to the system queue manager. The queue manager
dequeues the job from the FTS queue and activates the FTS dequeue
task (FTSDEQ) to process the URB files describing the job. The
job UIC, jobname and URB files associated with a given request may
be displayed by issuing SHOW QUEUE (DCL) or QUE /LI (MCR).
Several changes to the FTS/FTSDEQ/queue manager interface will be
apparent.

The naming convention for URB files has been changed to support
named directories of up to 9 characters. Formerly, if an FTS job
was submitted by a user whose default directory was [g,m], a URB
file describing that request would be created with the filespec
LB:[*workuic*]FTS*gggmmm*.URB, where *workuic* is set to [1,4] at FTSGEN
time and where *gggmmm* is the user's directory name, with comma and
leading zeros suppressed. For instance, a job requested under
[5,11] would result in LB:[1,4]FTS511.URB being sent to the queue
manager. Now, the URB file is named LB:[*workuic*]*directory*.URB,
where *directory* is the user's default directory string if named or
is the user's numeric directory, with comma (but not leading
zeroes) suppressed if numeric. The above job, for instance, will
now result in LB:[1,4]005011.URB being queued, while a job
requested under [ANDERSON] will queue the URB file
LB:[1,4]ANDERSON.URB.

Formerly, FTSDEQ always ran under [1,1], which caused problems

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when a job originally requested by a user under a different UIC
failed and was requeued by FTSDEQ. When the failed job was
requeued by FTSDEQ, the queue manager set the UIC of the job to
[1,1] and would report a privilege violation if the original user
attempted to use FTS to kill the job. The job could be killed
only by issuing the FTS kill command under the UIC [1,1], which
was not available to a nonprivileged user. FTS now dynamically
changes its current UIC to the UIC of the current user job being
processed. When FTSDEQ requeues a failed user job, the queue
manager assigns the job its original UIC, allowing the user to
kill or otherwise access the job.

8.7   FAL

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

FAL allows network file access to occur 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, then
the device must be made public using the SET /PUB=ddu: MCR
command before the disk is mounted. 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 has the ability to provide logging of file accesses. To
enable logging, you must provide the empty file LB:[1,4]FAL.LOG.
If this file exists, an entry will be appended to it for each file
access request. The system manager should take care that the file
is emptied often enough so that it does not overload with
continued use.

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 QAR. FAL must be
rebuilt to enable message tracing.

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

To activate tracing, assign the FT: logical device name to the
desired trace, using the ASN $dd\hat{n}$:=FT:/TERM=CO: command

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

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, which is not used by the RMS
based FAL.

9.0 MCM

The MCM utility submits command files for execution by invoking
either the indirect command file processor or, if the system
supports batch, the batch file processor.   Only one type of
submission will be supported by MCM; the type of submission is a
generation option.

If command files are to be submitted to the indirect command file
processor (...AT.), MCM will initiate the processing by executing
a command line at a specified terminal (the default is TT0:).
This default may be changed by reassigning LUN 1 of the MCM task
(installed with the task name .CMTS.), or by editing the file
[x,24]MCMBLD.CMD, changing the appropriate ASG option, and then
rebuilding the MCM task using the following commands:

```
SET /UIC=[x,24]
ASN aau:=IN:
ASN bbu:=OU:
ASN ccu:=MP:
ASN ddu:=LB:
TKB @MCMBLD
```

Where

```
     x:    is the group code for the network UIC.
   aau:    is the DECnet object disk.
   bbu:    is the output disk, where the network tasks reside.
   ccu:    is the map disk, where the network maps reside.
   ddu:    is the library disk, where the system files reside.
```

On systems which support multi-user protection, the specified
terminal must be logged on for MCR to accept the commands. Since
the system and file access privileges will be determined by the

account used to login the terminal, a non-privileged account
should be used or any network user could execute commands in a
privileged context.

The tasks MCM and AT. cannot be permitted to checkpoint each
other and should never be installed in the same partition unless
it is in a large system-controlled partition. Due to MCM's small
task size, consider installing it in the SYSPAR partition.

9.1 NFARs

This release includes no major changes to the NFARs.

You may wish to use the DAP trace module to debug 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.

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.

9.2 NCT

The following items should be noted when using NCT.

There is a problem with the VMS terminal server; terminal
characteristics may be incorrectly reported. An example is: upon
exiting EDT the terminal characteristics will be set to
NOLOWER and NOSCOPE. A temporary workaround to this is to type
SET /INQUIRE = TI:. This will set the characteristics correctly
even though a DEV TI: will still report the characteristics
incorrectly. This is a known problem, and a fix to the VMS server
is forthcoming.

VMS V4.0 treats escape differently than RSX. Thus when remoted
from VMS to RSX, escape will not be recognized as a terminator.
This can be prevented by setting NOLINEEDIT on the VMS system
BEFORE remoting to the RSX system.

When remoted from VMS to RSX, certain control characters may echo
differently than on RSX: for example, <CTRL/Z> echoes as EXIT.

When remoted from RSX to VMS there may be some screen formatting
differences as compared to a local VMS terminal. These
differences do not affect EDT or screen display programs, but may
affect read-with-prompt operations.

Some non-English LK201 keyboards do not have a backslash character
(\). To generate the CTERM enter-control-mode sequence, on an
LK201 keyboard, press the CTRL key, and then the numeral 4 <RET>,
instead of pressing the CTRL key and a backslash (\) <RET>.

A task issuing output to a terminal using embedded carriage
control and vertical forms control (VFC) will not work over a
CTERM link.

9.3 RMT

9.4 Use of RMT from Command Files

It is recommended that you do not invoke the RMT utility from an
indirect command file or from a batch job. The results are
unpredictable and depend much upon the system and upon the timing
involved.

9.5 Terminal Characteristics

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

   o   The local node terminal driver features.

   o   The local device characteristics that were set before the
       RMT session using the MCR SET command.

Any optional features not supported at the local node are not
supported during the RMT session. However, the characteristics
ANSI, DEC, AVO, EDT, BLK, RGS, and SFC are user selectable on a
remote host, even when unsupported on the local node. These
characteristics are implicitly set, based on the local terminal
type at the start of the RMT session, and by changing the terminal
type during the session. DECnet-11M-PLUS V2.0 and DECnet-11M/S
V4.0 nodes do not support these characteristics and will ignore
them if received.

9.6 Aborting RMT

On DECnet-11M-PLUS systems, the Remote Terminal task (RMTACP) is
made abortable through an Executive feature. Since this feature

does not exist on RSX-11M or RSX-11S, it is possible for a privileged user to abort the task while it is in use. If RMTACP or any other privileged task is aborted, the system data structures may be left corrupted.

If such an abort occurs, the users connected through RMT can enter a "garbage" line. The line causes RMTACP to be invoked again, and resets their terminals to the original state.

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

9.7 NETACP

NETACP has been modified to accept ASCII node address in the connect block and node names. The ASCII node address must be in the form *aannnn* where *aa* is the area number and *nnnn* is the node address within the area. The node address must be six characters long. Use leading zeros where required. For example 030022 would be the representation for node 3.22. All of the DECnet utilities allow ASCII node addresses as well as node names except for SET HOST.

9.8 NTDEMO

NTDEMO has been modified to include a new display for networks which use hierarchical routing.

10.0 LAT Control Program (LCP)

The LAT Control Program (LCP) controls the LAT process on a DECnet-11M-PLUS or a DECnet-Micro/RSX service node.

10.1 LDB Size

The LAT process requires a minimum buffer size of 576 bytes to start a circuit. If the buffer is too small, LCP rejects the START command.

10.2 Permanent Database

The LAT permanent database is stored in the LAT process template
file LAT.DAT in the network UIC. This file should only be edited
with LCP.

11.0 LCP Error Messages

Following is a complete list of LCP error messages with an
explanation for each error condition. Corrective measures are
suggested where possible.

LCP -- Command not accepted, privilege violation

>   The user does not have sufficient privilege to perform
>   the requested command.

LCP -- FATAL Comm Exec not loaded

>   The Comm Exec must be loaded before the LAT process
>   can be started.

LCP -- FATAL error allocating resources

>   There are not enough system resources to allocate the
>   data structures necessary to add the LAT terminals to
>   the system.

LCP -- FATAL error in system data structures

>   While linking the LAT terminal data structures into
>   the system data structures, LCP detected an error. A
>   detailed error message can be acquired by running HRC.

LCP -- FATAL error loading LAT process

>   NTL not installed or NTL could not load the LAT
>   process.

LCP -- FATAL error reading permanent database

>   This message indicates an error while accessing the
>   permanent database.   Check the LAT.DAT file in the
>   network UIC and ensure that the network UIC is set
>   properly.

NOTE

If this error results from using the CREATE
command, you can use the /TERMINAL=n switch
because the permanent database does not need
to be accessed.

LCP -- FATAL error starting LAT process

The LAT process returned an error when initializing.

LCP -- FATAL error stopping process

The LAT process returned an error when stopping.

LCP -- FATAL error updating permanent database - no update

The error occurred while creating a new file for the
updated permanent database. The original database is
unaffected.

LCP -- FATAL HRC error

HRC detected an error in the system data structure
while CONing the LAT terminals ONLINE. A detailed
error message can be acquired by running HRC.

LCP -- FATAL LAT process not in system

The LAT process is not in the network configuration.

LCP -- FATAL LDB too small to start LAT

The LAT process requires a minimum buffer size of 576
to start a circuit.

LCP -- FATAL parameters missing from permanent database

There is an error in the permanent database. The
permanent database LAT.DAT in the network UIC must be
restored to its original context.

LCP -- FATAL syntax error in permanent database

The error occurred while parsing the permanent
database. The permanent database, LAT.DAT, in the
network UIC must be restored to its original context.

LCP -- FATAL terminal driver does not support LAT

The terminal driver does not contain support for LAT.

LCP -- LAT process already started

> The LAT process has already been started.

LCP -- LAT process not active - issue START command

> The LAT process is not active.

LCP -- LAT terminals already created

> The LAT terminals have already been added to the
> system.

LCP -- LAT terminals not in system - issue CREATE command

> The LAT process cannot be started until the LAT
> terminals have been created.

LCP -- Line error, line in wrong state

> The line specified in the /DEVICE switch or in the
> permanent database is in the wrong state to execute
> the command.

LCP -- Line error, line not ready

> The line specified in the /DEVICE switch or the
> permanent database is not ready to START.

LCP -- Line error, no such line

> The line specified in the permanent database was not
> found in the system.

LCP -- Process not started

> The LAT process has not been started.

LCP -- Syntax error

> An invalid command has been issued.

A detailed explanation of the LCP utility can be found in the
DECnet-RSX Guide to Network Management Utilities manual.

11.1   PHONE

On DECnet-Micro/RSX systems, the initial size of Secondary Pool
provided by the operating system may not provide sufficient space
to allocate enough Accounting Blocks for users. This will result

in the Phone utility not being able to find the accounting
information for a logged-in user. If this condition occurs, Phone
will not allow the user to initiate a conversation with another
user since the accounting information is required.

If this problem is found, edit the LB:[1,2]SYSPARAM.DAT file to
increase the size of Secondary Pool. Refer to Chapter 6 of the
DECnet-RSX Micro/RSX System Manager's Guide for more detailed
information.

12.0 Cross-system File Transfer Notes

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

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

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

Neither the RMS-11 based nor the FCS-11 based RSX-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.

12.2 VAX/VMS V4.0 File Transfer Capabilities

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

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 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 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.

RSX-11M/M-PLUS and VAX/VMS have differing meanings for the E
protection category. On RSX, E means extend file access. On VMS
it means execute (run) file access. When transferring files to a
VMS system, the extend protection setting will be lost and execute
access will be allowed. When transferring from a VMS system, the
execute protection setting will be lost and extend access will be
allowed.

Space for VAX/VMS files is always allocated according to the
disk's cluster size. When transferring files from a VMS system to
an RSX system using the VMS COPY command, the extra blocks
allocated due to cluster round-up will not be truncated. When
this happens, you may truncate the file on the RSX node using PIP
file/TR command. In particular RSX task image files transferred
from a VMS system must 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 of the 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:

o   Stream-CR or Stream-LF Record Format (RFM) types.

o   The Contiguous-Best-Try Allocation option (*fop* or *aop* =
    CTB). VMS suppresses this option.

o   Numerous *fop* options including Truncate-On-Close.

o   Prologue Version 3 indexed sequential files. You must
    use CONVERT to change the file to Prologue Version 1 or
    2.

o $RELEASE and record locking: RMS-11 V2.0 only supports
    bucket level locking.

12.3 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 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 a 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.

12.4 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:

    o   Relative and indexed file organizations.

    o   Variable and VFC record formats.

    o   FORTRAN and implied LF-CR record attributes.

12.5 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.

12.6 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
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 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:

    o Relative and indexed file organizations.

    o Fixed, variable and VFC record formats.

    o FORTRAN and implied LF-CR record attributes.

    o Random record and block I/O access modes.

13.0 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.

All unsupported software can be generated by invoking the file [200,200]UNSGEN.CMD on the distribution disk.

13.1 CEDUMP - Communication Executive Database Dump Program

CEDUMP is a utility for dumping 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.

13.2 CEDUMP Switches

The functions of CEDUMP are controlled by a number of switches. The switches are divided into four categories:

    o General

    o Comm/Exec

    o DECnet

    o PSI

The operations of these switches are listed in the following sections.

13.3 General Switches

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

13.4 /HE - List the CEDUMP Switch Descriptors

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

13.5 /AL - Dump All Available Data Structures

Note that the data structures that will be dumped by the /AL switch depends upon the support built into the program at generation time and also the state of the network software at the time the switch is invoked. For instance, if the Comm/Exec is not loaded (via SET SYSTEM), no data structures will be dumped.

13.6 Comm/Exec Specific Switches

The basic network data structures are those which are present for all products layered upon the Comm/Exec and are dumped by the following switches.

    o   /CM - Dump the Comm/Exec common database

    o   /FR - Dump the free resource list status

    o   /LT - Dump the DLC/DDM process line tables and LLC
             databases

    o   /NL - Dump the network loader information

    o   /PD - Dump the process descriptors

    o   /PO - Dump the pool statistics

    o   /RV - Dump the reverse mapping table

o /SL - Dump the system line table

13.7 DECnet Specific Switches

DECnet specific data structures are dumped using the following
switches:

o /DH - Dump the DECnet home block

o /GE - Dump the DECnet general delivery queue

o /IO - Dump the NETACP I/O queue

o /LI - Dump the active line count

o /LL - Dump the logical links

o /LN - Dump the physical link blocks

o /MB - Dump the DECnet mailbox queue

14.0 RVT

RVT cannot be run under a terminal connected via RMT.   There are
some features which used to work when connected to VMS systems
using RVT which no longer work with VMS V4.0.

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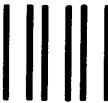
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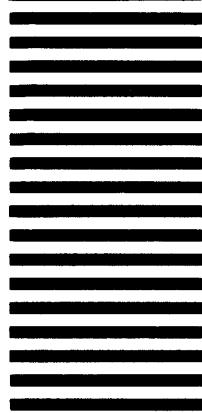
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