

NOS 2.5.2 LEVEL 678/670 SOFTWARE RELEASE BULLETIN

Control Data Corporation recommends that the Software Release Bulletin be read in its entirety prior to any NOS installation.

SMD131321



4201 Lexington Avenue North
Arden Hills, Minnesota 55112

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Dear NOS Customer:

In addition to the CIP, deadstart, and permanent file tapes you normally receive for a release, there is a new tape that contains the following files:

File 1: The Software Release Bulletin

File 2: The Feature Notes

File 3: A program library containing copies of NOS decks prior to being resequenced.

The tape is nine-track, 1600 density, internal format, and internally labeled with a VSN of SRB1.

Sincerely,

CONTROL DATA CORPORATION

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Chapter 1

SRB Introduction

This document is the NOS 2.5.2 L678/670 Software Release Bulletin (SRB). It is to be used in conjunction with the NOS Installation Handbook (IHB) for installing NOS and its products. Control Data recommends that the SRB be read in its entirety prior to software installation. You should also ensure that all of your hardware is at the FCA levels indicated in the Configuration Management section of the Software Availability Bulletin (SAB).

The NOS 2.5.2 L678/670 system described in this document is being released at the following levels:

Operating System	Level 678
Network Host Products	Level 678
Common Product Set	Level 670
CDCNET	Level 678

Audience

The SRB is written primarily for the site analyst. It contains notes and cautions about installation and usage of NOS 2.5.2 L678/670. Chapter 4 contains information intended for a system/operations administrator and Chapter 6 contains information for the end user.

Central Software Support Hotline

Central Software Support maintains a hotline to assist you if you have trouble using our products. If you need help not provided by the documentation, or find the product does not perform as described, call one of the following numbers. A support analyst will work with you.

From the USA and Canada: (800)-345-9903

From other countries: 612-851-4131

Chapter 2

Installation

Notes and Cautions

This section highlights system and installation changes that may significantly affect the installation of NOS 2.5.2 L678/670.

CIP V7 L678 Required for All CYBER 180 Mainframes

All CYBER 180-class machines require CIP V7 L678 to deadstart NOS 2.5.2 L678/670. For further information regarding CIP, refer to the CIP V7 L678 SRB.

Changes to Operating System Decks

The following decks were resequenced at NOS 2.5.2 L678/670:

COMCCMD	COMPGFP	COMSLSD	ORP	CPUPFM	QGET
COMCVQF	COMPLDA	COMSSFm	ORT	CPUREL	ROUTE
COMDDSP	COMPMRM	COMTCVT	1MA	DSDI	SMFSUBS
COMFDS1	COMPPDI	COMTNAP	1MD	EQPINST	TCOMND
COMFDS2	COMPSDN	REC	1MI	FSESCRN	VIRTERM
COMFVD1	COMPSFE	SET	1RI	IAFEX	
COMFVD3	COMPTMA	STL	1RO	ICPD	
COMFVDT	COMSACC	TLX	1TA	IPRINST	
COMPMAC	COMSDSP	VEJ	1TO	KEYEX	
COMPCEA	COMSEVT	ODQ	CLASS	MSI	
COMPDDT	COMSHIO	OFA	CONTROL	QFSP	

To aid in upgrading local modsets, a PL containing the pre-resequenced versions of these decks (containing all 2.5.2 code up to the time of resequencing) is available on the SRB tape.

The following decks are new at NOS 2.5.2 L678/670 :

- DDF - Display disk file utility.
- 1CL - Firmware loading routine for CIO PPs.
- 1HY - 887 PP driver.
- 1XY - 895 DMA single PP driver.
- 6DD - Concurrent PP MS overlay loader.
- DDFILE - CPU helper program for display disk file utility.
- ISHARED - Modset to allow MSE use with independent shared device MMF.
- MSGID - Message IDs for the security audit reduction tool.
- SECART - Security audit reduction tool.

The following decks were deleted at NOS 2.5.2 L678/670 :

CPUDSD
All decks on the Mass Storage Subsystem (MSS) PL

Change to DECKOPL SEED Procedure

One of the parameters in the SEED procedure in DECKOPL has changed. The REBUILD parameter has been changed to NOREBLD. Now, the SEED procedure loads the full set of binaries needed to satisfy any dependency into GLOBLIB and PRODUCT by default. Previously, it was necessary to specify REBUILD to accomplish this task. If the NOREBLD parameter is specified, only the minimal set of binaries are put in GLOBLIB and PRODUCT. This was the old default. NOREBLD should be specified ONLY if all products will be rebuilt; for example, 63 character set sites should use this keyword. This change is reflected in the NOS Installation Handbook, Revision J.

PSR Summary Report

A summary report of all the NOS PSR modsets in NOS 2.5.2 L678/670 is available on the permanent file tapes. It is loaded to the installation user name INSTALL during the SYSGEN procedure call SYSGEN(SOURCE) with a permanent file name of PSRRPT.

CODEPL Modsets

CODEPL is automatically loaded to disk on your installation user name by the SYSGEN(SOURCE) procedure call. This code is not on the program libraries, but was used to generate the binaries for this release. CODEPL contains modsets for the following products:

- PASCAL An incompatibility exists between PASCAL and CMM with segmentation when interfaced with other products using common memory manager. Code to fix this problem is available under PSR PA10027.
- SORT5 The wrong minimum buffer length causes SORT5 to hang. Code to fix this problem is available under PSR ST5A381.

CDCNET Installation

Installation of CDCNET is documented in the NOS IHB, however, upgrade and component order customers should note the following:

1. Upgrade customers will notice that a number of new files to aid in configuring CDCNET are now loaded as part of the installation of CDCNET. The CDCNET chapter of this SRB, chapter 7, contains additional information about these files in the section on CDCNET configuration.
2. If you are installing CDCNET for the first time as part of a component order, follow the instructions in the NOS IHB for installing CDCNET. However, if you are adding a CDCNET separately priced TIP in a component order, use the following instructions:

- a. Log into user name INSTALL from an interactive terminal.

- b. Execute the following command:

```
RECLAIM,Z./DELETE,UN=NS2678,PF=*/PFGNDL1,PFGCHA1,PFGCHA2,PFGDCNS
```

This command "deletes" these files from the database. (The files are still there, but they are not processed during normal operations.)

- c. Update the RECLAIM database with information about the files on the component order tape by entering:

```
SYSGEN,UPGRADE,O,O,vsn,density.
```

Replace vsn with the VSN of the CDC supplied component order tape. The VSN is listed in the media number field of the external tape label. Replace density with the tape density of the permanent file tape (HY, HD, PE, or GE).

- d. Log into user name NETADMN from an interactive terminal.

- e. Execute the following command:

```
BEGIN,UPGRADE,DCNPLIB,NETADMN.
```

This command requests the permanent file tape and updates the files on user name NETADMN. Since the CDCNET version level is the same as the original release level of CDCNET, the existing files whose names contain the CDCNET version level will be overwritten. The only file which is different is L70vvvv, the CDCNET object library.

Installation of the software is complete. You now must alter your DI configuration procedures to configure in the separately priced TIP. Consult the CDCNET Configuration and Site Administration Guide for details.

All Local PP Programs Must Be Reassembled

Changes to PPR entry points at NOS 2.5.2 L678/670 require that all sites reassemble any locally written PP programs.

Dual State Support

NOS 2.5.2 L678/670 includes support of the Dual State product. A build procedure in DECKOPL, a source library, and permanent files are released with this product. Dual state binaries for NOS/VE 1.2.2 L678 are contained on the NOS deadstart tape for Dual State customers. Binaries for NOS/VE 1.2.2 L678 compiled to run on NOS 2.5.1 L670 and L664/650 are contained on the permanent file tapes. For complete information, refer to the NOS IHB on how to obtain these binaries.

Support Change for Mass Storage Subsystem

Support for the Mass Storage Subsystem (MSS) is being dropped for NOS 2.5.2 L678/670. The successor product, Mass Storage Extended (MSE), remains fully supported.

The following manuals contain references to MSS:

NOS Version 2 Analysis Handbook	60459300
NOS Version 2 Diagnostic Index	60459390
NOS Version 2 Installation Handbook	60459320
NOS Version 2 Operations Handbook	60459310
NOS Version 2 Reference Set, Volume 3, System Commands	60459680
NOS Version 2 Systems Programmer's Instant Binary Maintenance Log (BML), Message Formats	60459370 60459940

References to MSS were removed from the NOS Installation Handbook. However, the other manuals will not reflect this change until their next revision.

Chapter 3

Analysis

Notes and Cautions

This section highlights changes in the NOS 2.5.2 L678/670 operating system which may be of interest to the site analyst.

CPM Function 56B Change

A new option is available with CPM function 56B. If this option is selected, the calling job will receive an error status rather than rolling out when CPM encounters a mass storage error or finds the mass storage device inaccessible when trying to access the validation file. Instead, an error status is returned to the caller. See the documentation in deck CPM if you are interested in selecting this option.

Incompatibilities

This section describes any system incompatibilities with previously released NOS systems. The intended audience is primarily the NOS system site analyst.

I4 FCO Required to Run NOS 2.5.2 L678/670 with 887 Disks

All sites with 887 disk drives and an I4 CIO are required to upgrade the JZ boards in the I4 CIO in order to run NOS 2.5.2 L678/670. The disk drives do not operate properly without FCO number CA48479. Sites may still run NOS 2.5.1 L670 without this FCO if they wish.

Change in Tape Detailed Status Error Message

The following is an example of a detailed status error message for tapes:

```
NT,C33-0-03,***053,RD,    S0,GS03013360
NT,C33,D00120000000440000077720000001500
NT,C33,U4056000000000013200000101,T4000.
NT,C33,F07,I00,B000000,L0504,P10020200.
NT,C33,E32,H42636640, sss.
```

The "sss" portion at the end of the message describes the error condition. For some error conditions, the format of "sss" has been changed to a 3-character mnemonic. The following is a list of the 3-character mnemonics along with the error messages they represent:

Error Code	Definition
-----	-----
BCR	MTS BUFFER CONTROLLER RESTART
BFR	READ ID BURST FAILURE
BFW	WRITE ID BURST FAILURE
BTL	BLOCK TOO LARGE
CMF	CHANNEL MALFUNCTION
ERA	ERASE ERROR
LCH	LOAD CHECK DURING CONNECT (WARNING)
MDW	CHANNEL DOWNED DUE TO MARGINAL CONDITION
MOF	UNIT TURNED OFF - READ/WRITE PATH FAILURE
MWT	MARGINALLY WRITTEN TAPE
NBE	NOISE BLOCK ERROR
OPA	OPPOSITE PARITY MODE
OTF	ON THE FLY ERROR CORRECTION
PLO	POSITION LOST
RCE	REPOSITION CORRECTED ERROR
REC	RECOVERED ERROR
SMB	SINGLE BLOCK MISPOSITION BACKWARD
SMF	SINGLE BLOCK MISPOSITION FORWARD
STE	STATUS ERROR
TCF	TAPE CLEANER FAULT
TME	WRITE TAPE MARK FAILURE
WVF	WRITE VERIFY FAILURE

For further information, refer to Appendix B of the NOS 2 Reference Set, Volume 3, System Commands.

Change in Tape Error Codes

Most of the tape error codes have been changed. NORM and HPA have already been changed to respond to these error codes, but any other user diagnostics should be changed accordingly. The new error codes and their definitions are as follows:

Error Code	Definition
12B	TAPE MANAGER ERROR
13B	LABEL MISSING
14B	LABEL CONTENT ERROR
15B	TRAILER BLOCK COUNT ERROR
16B	LABEL PARAMETER ERROR ON OPEN
17B	ILLEGAL LABEL TYPE
20B	XL BUFFER/FET PARAMETER ERROR
21B	OPPOSITE PARITY MODE
22B	MULTI-FILE NOT FOUND
23B	BLOCK TOO LARGE
24B	BLOCK NUMBER ERROR
25B	NOISE BLOCK ERROR (WARNING ONLY)
26B	ON THE FLY ERROR CORRECTION
27B	READY DROP
30B	FUNCTION REJECT
31B	WAIT EOP OR BUSY TIME OUT
32B	CONNECT REJECT
33B	STATUS ERROR
34B	ERASE ERROR
35B	POSITION LOST
36B	CHANNEL MALFUNCTION
37B	MTS BUFFER CONTROLLER RESTART
40B	SINGLE BLOCK MISPOSITION FORWARD
41B	SINGLE BLOCK MISPOSITION BACKWARD
42B	CHANNEL DOWNED DUE TO MARGINAL CONDITION
43B	UNIT TURNED OFF - READ/WRITE PATH FAILURE
44B	LOAD CHECK DURING CONNECT (WARNING)
45B	REPOSITION CORRECTED ERROR
46B	MARGINALLY WRITTEN TAPE
47B	WRITE VERIFY FAILURE
50B	WRITE TAPE MARK FAILURE
51B	ERROR FLAG TERMINATION
52B	TAPE CLEANER FAULT
53B	READ ID BURST FAILURE
54B	WRITE ID BURST FAILURE

Refer to Appendix B of the NOS 2 Reference Set, Volume 3, System Commands for further information.

Chapter 4

Operations

Notes and Cautions

This section highlights changes to the NOS 2.5.2 L678/670 system which may be of interest to the administrator responsible for performing user validations and accounting activities and/or the person responsible for operational activities.

Disk Validation

NOS performs hardware verification on each mass storage device during the deadstart process before users are allowed to access the device. The hardware verification sequence includes writing data to the disk, reading the data from the disk, and finally comparing the read data with the write data to ensure integrity. For 887 disks, the hardware verification includes running the 887 in-line level two diagnostics. Since the level two diagnostics verify the quality of the disk media more completely, it is to your advantage to run them. These diagnostics take approximately three minutes to execute, during which time the 887 disk is not available for use. If you want to keep deadstart time to a minimum (i.e., when you are doing testing), disk validation can be disabled via the following IPRDECK command:

```
DISABLE,DISK VALIDATION.
```

Removal of the HD Parameter from the NDL

Since the HD parameter has been changed to be a one-time terminal user request, it is no longer necessary to specify it in the NDL. Therefore, network administrators should remove any TERM/DEVICE statements that may contain it.

In the next release, NDLP will be modified to issue a fatal error if it encounters an HD parameter.

Security Audit Reduction Tool

The Security Audit Reduction Tool (SECART) is provided to assist the system security administrator. It does this by reducing the volume of information which must be analyzed to audit security relevant system activities. SECART is designed to process messages recorded in the system dayfile and the account dayfile and to produce reports and files useful for security auditing purposes. Further information regarding SECART is available by executing the following commands:

```
ATTACH,DPL=opl.  
MODIFY,C,Z./*EDIT,SECART  
DOCUMENT,L=list.
```

where opl is the name of your composite opl and
list is the name of the file to contain
the program documentation.

Queue Utility Changes

A new parameter, PO=U, has been added to QLOAD, QDUMP, QMOVE and QREC. If PO=U is specified, the utility unconditionally processes all files regardless of family, lid, creation date, or other selection criteria. This is especially useful for manipulating queue files originating on NOS/VE; they are frequently not selected by the queue utilities because of the family name under which they were queued.

We also suggest that you specify this new parameter on the QREC command issued at deadstart (from the DSD command in the IPRDECK); the released versions of the IPRDECK have been changed to include a QREC(PO=NU) for this reason.

In most cases, other selection parameters are ignored if specified with PO=U.

Incompatibilities

This section describes the operational changes made in the NOS 2.5.2 L678/670 system which may be incompatible with previously released NOS systems. The intended audience is primarily the administrator responsible for performing user validations and accounting activities and/or the person responsible for operational activities.

DSD Display Changes

The following changes have been made to DSD:

1. Generic ID Command

The individual commands that change the identification of unit record equipment have been replaced by the ID command. This new command eliminates the need to specify both the EST ordinal and the equipment type when changing an equipment's identification. The format of the command is:

ID,est,id.

where est is the EST ordinal and id is the equipment identifier, ranging from 0 to 67B.

The equipment type of the specified EST ordinal must be CP, CR, LQ, LR, LS, LT, LX, or LY.

The following commands have been eliminated:

CP,est,id.
CR,est,id.
LQ,est,id.
LR,est,id.
LS,est,id.
LT,est,id.
LX,est,id.
LY,est,id.

2. Changes to T-Display

The T-Display has been modified to display the network terminal name in addition to the connection number, JSN, user name, and WARN message flag. Also, the active user and total user counts have changed from octal to decimal, with a trailing 'D' as a reminder of the change. The 'MORE' message, indicating a second page of the display, has moved to the center of the page rather than beneath the first column.

3. Changes to "QDSPLAY,jsn." and "DROP,,qt." Commands

The "QDSPLAY,jsn" command, where jsn represents job sequence name, has been changed to not require UNLOCK status if in unsecured mode; SECURITY UNLOCK status is still required for secured systems.

The "DROP,,qt." command, where qt represents queue type,

4. Changes to H-Display

The H-display has been modified to display the local files assigned to a job, as well as system files. "H,jsn." displays the local files of a job at a control point. "H,." displays the system files as before. is modified to require UNLOCK status to be set.

5. Changes to S-Display

The S-Display has been modified to show the number of active jobs in each service class. The new field is labeled 'AJ' (active jobs) and is present below the 'NJ' field, which displays the total number of jobs possible for each service class.

6. Changes to A-Display

The A-Display has been enhanced to display more of the dayfile buffer on the screen. In the past, not all of the data was displayed and the screen periodically was cleared with only the most recent messages being displayed at the top of the screen. Now the A-display never clears the screen.

In addition, the keys normally used to page displays are used to enable and inhibit scrolling on a CC545 console. The backward keys, - or), inhibit scrolling for about 20 seconds. To resume scrolling before the 20 seconds has elapsed, the forward keys, + or (, can be used.

7. Changes to Q-Display

The Q-display has been modified to show the QFT ordinal of each queue file in the display.

8. Changes to "B,A." Display

The default B display is now the "B,A." display rather than the "B,O." display. The format of the "B,A." display has been changed as follows:

Upon bringing up the display, the following information is shown:

B,A. SYSTEM STATUS.

CP	JSN	SC	PR	FL	CPU	STATUS
1	IAF	X	76	414	X	WAITING FOR NETWORK.
2						
3	AAAG	S	30	24	X	REWIND,*.
4	AAAD	S	75	32		
5	AAAN	M	2	100	W	DUMP COMPLETE.
.						
.						
.						
24						

MORE

Upon hitting the "=" key (if the display is on the right screen) or the "/" key (if on the left), the "B,A." display shows the following alternate data fields.

B,A. SYSTEM STATUS.

CP	JSN	EJT	SCPR	FLE	SS	STATUS
1	IAF	2	7776	0		WAITING FOR NETWORK.
2						
3	AAAG	3	7776	0		REWIND,*.
4	AAAD	6	7776	0		
5	AAAN	17	10	0		DUMP COMPLETE.
.						
.						
.						
24						

MORE

Validation Range Changes

The validation ranges for the permanent file validations and the executing batch job count have been changed to the following:

Batch Job Count (DB)

Old Formula: job count = 2 * index

New Formula: job count = 2 ** index

where index represents the value of the index in the VALIDUS file.

Permanent File Validations

<u>Parameter</u>	<u>Index</u>	<u>Old Validations</u>	<u>New Validations</u>
CS	0	use job origin	use job origin
(Cumulative	1	1000	1000
size of all	2	2000	5000
indirect	3	5000	50000
access files	4	10000	100000
for user)	5	50000	200000
	6	100000	400000
	7	unlimited	unlimited
DS	0	use job origin	use job origin
(Direct	1	1000	1000
access file	2	2000	5000
size limit)	3	5000	50000
	4	10000	100000
	5	50000	200000
	6	100000	400000
	7	unlimited	unlimited
FC	0	use job origin	use job origin
(Maximum	1	10	10
number of	2	20	40
permanent	3	30	100
files)	4	40	200
	5	50	1000
	6	100	4000
	7	unlimited	unlimited

Parameter	Index	Old Validations	New Validations
FS	0	use job origin	use job origin
(Indirect	1	10	10
access file	2	30	30
size limit)	3	50	100
	4	100	300
	5	150	1000
	6	300	2000
	7	unlimited	unlimited

NOTE

Existing validations are increased automatically unless the site explicitly changes the user validations to a lower index value.

For further information, consult the NOS 2 Administration Handbook.

Changes to the BLANK Command

The BLANK command has been modified to inform the operator of any errors encountered while writing tape labels. In addition, the ability to retry the blank labeling operation is also provided; simply enter "GO,jsn." when prompted.

If the vsn entered on the command is a legal file name other than SCRATCH, the vsn is displayed in the flashing BLANK request rather than just displaying BLKTAPE. BLANK uses a file with the same name as the vsn.

Known Problems

This section describes known problems at the time of this release.

Involuntary Detach Problem.

A job will hang and be unrecoverable if an involuntary detach of the job occurs (i.e., interactive line disconnect) and the user is not validated for the DETACHED INTERACTIVE(DI) service class. This is the result of modset 1MA17 (PSR NS2F163) which caused LMA to switch the service class of a job upon involuntary detach to the detached service class.

Sites should ensure that all users are validated for the DETACHED INTERACTIVE service class to avoid encountering this problem. However, if this problem does occur, an operator drop will terminate the job and the job will need to be rerun.

Code to fix this problem can be found on SOLVER under PSR NS2F584.

NDLP Deficiencies When Compiling OUTCALL Statements

NDLP has the following deficiencies when compiling OUTCALL statements in the local configuration file (LCFFILE):

1. NDLP does not accept the special characters underscore, commercial at, pound sign, and dollar sign (`_`, `@`, `#`, `$`) in the SERVICE name. This problem can be tracked under PSR NA5B781.
2. NDLP does not enforce that the SERVICE = service_parameter is specified if the destination operating system is NOS/VE (NETOSD=xxV). This problem can be tracked under PSR NA5B782.

Chapter 5

End User

Notes and Cautions

This section highlights changes to the NOS 2.5.2 L678/670 operating system which may be of interest to the end user.

Password Masking Fails Without CCP Upgrade

Sites running NAM level L678 but not upgrading CCP, will find that the user password is not be masked out at login time. There is no problem, however, running with a pre-L678 N M and L678 CCP.

Incompatibilities

This sections describes changes made to the NOS 2.5.2 L678/670 system which may be incompatible with previously released NOS systems.

DAYFILE Change

The manner in which DAYFILE functions when the FR parameter is used has changed. If the FR parameter is specified on the DAYFILE command and the specified string is not found, DAYFILE no longer copies the entire dayfile to the output file unless the output file is assigned to the terminal. This change was made to conform with the way DAYFILE has always been documented in the NOS 2 Reference Set, Volume 3, System Commands.

Change in Error Processing

There is now a limit on the number of times a job can continue processing (via REPRIEVE, EREXIT, or DISTC) following an error. The value for this limit is defined by the common deck COMSMSC constant *EPRL*. The released default value of this limit is 777B. A value of 7777B is considered to be infinite (unlimited).

Known Problems

This section describes known problems at the time of the release.

FORTTRAN 5 Job May Fail on Large Memory Configuration

The FORTTRAN 5 subroutine MOVLCH fails if a user calls this subroutine on a system with all of the following characteristics:

- . The system is a CYBER 180 model 810, 830, 840, 845, 850, 855, 860, or 870.
- . More than 2 million words of memory (CM and UEM) have been defined for NOS.
- . User extended memory is defined in the EQPDECK via the XM command.

This problem has been fixed by PSR FL5A699 and the code is available on SOLVER.

Chapter 6

Configuration Management

Notes and Cautions

This section highlights changes in configuration management at this release.

Testing Environment

The NOS 2.5.2 L678/670 system was tested in an environment containing the following components:

Hardware Component -----	Release Level -----	CIP Level -----
Model 810 Microcode	M14AA14	V7 L678
Model 815 Microcode	M11AA14	V7 L678
Model 825 Microcode	M12AA14	V7 L678
Model 830 Microcode	M13AA14	V7 L678
Model 835 Microcode	M20AA15	V7 L678
Model 840 Microcode	M340X08	V7 L678
Model 845 Microcode	M310X10	V7 L678
Model 850 Microcode	M330X11	V7 L678
Model 855 Microcode	M300X09	V7 L678
Model 860 Microcode	M320X10	V7 L678
Model 990 Microcode	M40AX17/18	V7 L678/678A
Model 990 Microcode	M41AX17/18	V7 L678/678A
800 Series Environment Interface (EI)	Level 18	V7 L678
MDD	V13	V7 L678
SCD	V05	V7 L678
DFT	V03	V7 L678
SCI	V01	V7 L678

NOTE

Microcode for model 870 is the same as that for the 860 and microcode for model 995 is the same as that for the 990.

PTF/QTF Transfer Facilities Interconnections

The following are the recommended systems for proper operation of the PTF/QTF Transfer Facilities through RHF/LCN, NAM/CCP, or NAM/CDCNET:

NOS 2.5.2 L678/670 to NOS 2.5.2 L678/670 (RHF/LCN, NAM/CCP, and NAM/CDCNET)
NOS 2.5.2 L678/670 to NOS 2.5.1 L664/650 (RHF/LCN, NAM/CCP, and NAM/CDCNET)
NOS 2.5.2 L678/670 to NOS/VE 1.2.2 L678 PTF (RHF/LCN and NAM/CDCNET)
NOS 2.5.2 L678/670 to NOS/BE 1.5 L650 (RHF/LCN)
NOS 2.5.2 L678/670 to VSOS 2.3 L670 (RHF/LCN)
NOS 2.5.2 L678/670 to IBM RHF 1.2.2/2.2.2 L671 (RHF/LCN)
NOS 2.5.2 L678/670 to VAX RHF 1.7 L678 (RHF/LCN)
NOS 2.5.2 L678/670 to CYBER 120 AOS/VS (NAM/CCP and NAM/CDCNET)

Chapter 7

CDCNET

Introduction to the CDCNET Chapter

The information contained in this chapter pertains to CDCNET as used in NOS, NOS/VE, and NOS-NOS/VE dual state systems. Sections specific to NOS only or NOS/VE only, are so indicated. Material not specifically designated as NOS ONLY or NOS/VE ONLY applies to CDCNET in all types of network environments.

This chapter provides information about CDCNET which is generally divided into two categories.

1. The first two sections of the chapter (Significant Problems and Notes and Cautions) contain information addressing known problems and difficulties which may be encountered with CDCNET and its associated hardware or software. This information is provided to help prevent, identify, and correct such problems and difficulties.
2. The remaining sections offer informative articles about the configuration, operation, and use of CDCNET that is generally not available in manuals or is specific to this and future releases.

Command Convention for the CDCNET Chapter

To distinguish CDCNET commands from other command language groups, the following conventions apply to the examples in this chapter:

- . CDCNET and CDCNET Host Utility commands are represented in all lower case characters. An example of a CDCNET command is:

```
change_working_connection (chawc) connection_name=$A
```

- . Operating system and other non-CDCNET commands are in upper case characters. An example of a non-CDCNET command is:

SET_COMMAND_LIST (SETCL) ADD = MY_COMMANDS

- . CDCNET command examples are printed in full followed by the abbreviated form in parenthesis. The optional abbreviated form is given for convenience; it may be entered in place of the full command.
- . The CDCNET network command character (default = %) is represented by the notation <ncc>.

Significant Problems

This section identifies significant problems associated with CDCNET. Problems are identified and tracked by Programming System Reports (PSRs). The following is a list of identification numbers and brief descriptions of outstanding CDCNET PSRs described in this section.

- AC1E105 - NPA REFCLF Reprocesses a Previously Processed Log File
- AC1E560 - Create_Connection Command Lock Out Effect
- AC1F393 - Incorrect Service Status Display
- AC1F418 - Incorrect State of Device Displayed
- AC1F449 - ESCI Subsystem Statistics Collection
- AC1F472 - Explicit Configuration Causes Log/Alarm messages
- AC1F564 - Limit Byte Count on Memory Displays
- AC1F638 - Routing algorithm error causes DI reset
- AC1F668 - Improper Commands Cause Excessive Memory Usage
- AC1F669 - Inconsistent Results Loading a DI
- AC1F704 - Passthrough Ports Periodically Lock Up
- AC1F722 - Error in @PASS_TO_HOST1 TUP
- AC1F724 - Garbled Output on Two Printer HASP Station
- AC10184 - Batch Device Definition Parameters Not Processed Properly
- AC1E002 - ANACD User Breaks - NOS/VE Only
- AC1F486 - Cycle 1 Files Cause REPCF failure - NOS/VE Only
- AC1F674 - Batch Device Errors Cause File Mix-up - NOS Only
- AC10199 - NPA and NOS COLLECT File Name Conflict - NOS Only
- CHAA190 - NETOU Aborts During Host Operator Log Out - NOS Only

A detailed description of each PSR is provided in the following sections. If a suitable work-around is known for the problem it is included.

AC1E105 - NPA REFCLF Reprocesses a Previously Processed Log File

NPA REFCLF operates under an incorrect assumption that all log files are in increasing date and time order. Misleading reports can result because REFCLF can reprocess or never process some data.

Take care when reformatting log files with REFCLF to avoid loss of data. When a log file is reformatted to a database, NPA records the time of the last log message into the database. On a subsequent reformat, any log message with a time earlier than the time recorded in the data base is skipped. An example of a lost data situation is reformatting two log files separately and in the wrong order. Reformatting the same two log files in a single NPA reformat run does not result in a lost data situation since NPA sorts out the order.

AC1E560 - Create_Connection Command Lock Out Effect

The `crc` command does not complete until the selected service accepts or rejects the users connection attempt. Under some conditions, a service may not be able to immediately respond to a connection attempt. In extreme cases the response may not arrive for a long time. While the `crc` command processor is waiting for a response from the service, the user's working connection is the connection from which the `crc` command was issued. The user is put in solicited input mode where his input is accepted by the network but is not processed until the `crc` command completes. The user is essentially locked out until the `crc` command completes.

During a `crc` "lock out", the user can enter the Break or Attention character to cause input to be processed. A message received from the network operator during this time also causes input to be processed. The input following either of these events is treated as a command and is discarded if the `crc` command was issued from the `$CDCNET_Command` connection. If the `crc` is entered from a `$I/O` connection, the input is forwarded on that connection. Any output from that `$I/O` connection is delivered to the terminal. In either case, until the `crc` command completes, the connection from which it was issued remains the working connection and no terminal user commands are processed.

AC1F393 - Incorrect Service Status Display

The following command is subject to delays and incorrect service status.

```
display_service(s) (diss)
```

Delays are due to DI polling of network directories to obtain their current status. In most cases, no delay occurs.

The UP/DOWN service status, returned by this command, may intermittently be incorrectly reported. The DI reporting the status does not always have the latest status of the services available in other systems. When multiple titles are used for the same service (aliases), it is possible to receive conflicting status. A `create_connection` (`crc`) command causes the status for the service name specified to be updated, but not for the aliases.

AC1F418 - Incorrect State of Device Displayed

The status of BSC 3270 lines is incorrectly returned as 'not ready' when there is output queued for the device and the following command is issued.

```
display_line_status (disls) ..  
display_option = extended
```

This problem can occur during a print operation or when the console is waiting for a response for a hold-page.

AC1F449 - ESCI Subsystem Statistics Collection

When more than one ESCI subsystem is active in a DI, the ETHERNET error statistics listed below are only collected for the last subsystem started:

1. Number of messages lost from CRC errors
2. Number of messages lost from resource errors
3. Number of messages lost from alignment errors
4. Number of messages lost from overrun errors

The corresponding items in the following list addresses the effect of the missing statistics:

1. ESCI failure management generates a log message (log ID 1200) whenever the number of CRC errors reaches its failure threshold. The default threshold is 2 per 60 second interval. This message is a good replacement for the missing CRC error statistic.
2. The "Number of messages lost from resource errors" is only one of a number of low memory availability indications. The loss of this statistic is of no consequence in the diagnosis of ESCI problems.
3. The alignment error occurs whenever there is a collision. No alternative statistic is available at this time.
4. No alternative is available for the missing "number of overrun errors" statistic, however, the possibility of overrun errors is extremely remote.

AC1F472 - Explicit Configuration Causes Log/Alarm messages

Configuration files containing commands defining the ETHER/CHANNEL/HDLC trunk and network that a DI is loaded over will cause log and alarm messages indicating that the trunk and network are already defined.

The commands to define the trunk and network that a DI is loaded over are performed implicitly by the DI software load process. Explicit use of these commands does not permit redefinition of the trunk and network names which were implicitly defined. The presence of these commands in configuration files does not adversely affect the loading and configuration process. The

log and alarm messages mentioned above can be ignored. However, any other commands in the configuration file which mention the trunk or network name will fail if the default trunk and network names are not used and the configuration process will be affected.

This situation is most likely to occur under the following circumstances.

1. When using TDI and NDI configuration files created by MANCC which contain `define_ether_trunk` and `define_ether_net` commands for the trunk and network which was implicitly defined.
2. In configurations where the site has chosen to allow loading over multiple trunks (the boot enabled switch is set for multiple cards). In this case, all trunks and networks must be defined explicitly since it is not known which card slot will be configured implicitly. The above typically applies to dual ESCI/MCI/HDLC configurations where the site has chosen to allow loading over both ETHER/CHANNEL/HDLC trunks.

In the first case, it is recommended that the unnecessary commands be removed from the configuration files or that the network administration and operations personnel be advised that these log messages and alarms are not a cause for concern. Additionally, any other commands in the configuration files that mention the ETHER trunk or network which is implicitly defined must be changed to specify the trunk name assigned by the load process and to omit the network name parameter (allowing the default value to be used).

In the latter case, it is recommended that all commands in the configuration files that mention the ETHER/CHANNEL/HDLC trunks or networks be changed to specify the trunk names assigned by the load process and to omit the network name parameters (allowing the default values to be used). Network administration and operations personnel should be advised that the log messages and alarms, indicating that the trunk and network that the DI was loaded over are already defined, are not a cause for concern.

The load process assigns the following trunk names.

- . \$ESCI_n for an ETHER trunk, where *n* is the slot number in the DI that contains the ESCI card.
- . \$MCI_n for a CHANNEL trunk, where *n* is the slot number in the DI that contains the MCI card.
- . \$LIM_n_PORT_m for an HDLC trunk, where *n* is the slot number in the DI that contains the LIM card and *m* is the number of the port on the LIM card to which the HDLC line is connected.

AC1F564 - Limit Byte Count on Memory Displays

When using the `display_memory` command, use the default value for `byte_count` and a `repeat_count` value less than 1500 (decimal). If a `byte_count` between 2 and 15 is specified, a large `repeat_count` causes the `display_memory` command to use large amounts of data buffers to hold the response. Depending on the number of buffers available at the time, this could cause a DI reset.

AC1F638 - Routing algorithm error causes DI reset

There are some conditions involving multiple paths between systems, such as redundant Ethernets connecting several DIs or parallel HDLC trunks, which will cause one or more of the DIs in the path to reset if the cost or availability of the path changes.

If this type of reset occurs, you will see the following information when analyzing the dump:

```
reset_code 18(16) = TASK_ERROR_NO_RECOVERY_PROC
```

Also, the executive error table display indicates "zero divide" and the traceback will include `INTERNET_PMM+4CA` and `INTERNET_PMM+148`.

AC1F668 - Improper Commands Cause Excessive Memory Usage

The loss of System Main Memory (SMM) in an MDI/NDI, can be caused by the inappropriate execution of the following commands:

```
define_tip (deft)
define_line (defl)
start_line (stal)
stop_line (stol)
```

When these commands are executed in a DI without the proper configuration, certain tasks are started prematurely and not terminated. This causes a considerable amount of memory (upwards of 100,000 bytes) to be lost until the DI is reset. The DI can go to a memory fair, poor or congested state and may not accept commands from NETOU.

Avoid executing these commands in a DI when they are not appropriate for the way in which the DI is configured.

AC1F669 - Inconsistent Results Loading a DI

Various errors have been found to occur while loading a NOS/VE MTI. This problem has also been seen in other DI variants, but more often with a NOS/VE host. The list below describes the various ways the errors occur.

1. The time it takes to load and configure a DI is longer than normal (in excess of 2 minutes).
2. Errors occur in executing configuration file commands. Log and alarm messages (number 22) are produced as a result of the errors.
3. Unchanged configuration files, that have loaded successfully, can not be found. A DI reset code of 1B(16) occurs as a result.

In the first case, the DI is configured properly despite the long load time; no action is required. In the other two cases the DI should be reloaded after waiting about 7 minutes. This allows the DI to be configured properly.

These problems are likely to occur if a DI is repeatedly reset before the NOS/VE host or corresponding NOS MDI times out disconnected Transport connection table entries. When data is received on one of these connections it is discarded with no indication to the peer Transport.

AC1F704 - Passthrough Ports Periodically Lock Up

If a passthrough port receives a flow control condition (XOFF or CTS drop) from a foreign host just prior to the passthrough connection being deleted, the passthrough port may remain in a flow control state for all subsequent passthrough users. Input from the subsequent users will not be sent to the foreign host. To recover from this condition, the passthrough port must be stopped and restarted using the network operator `Stop_Line` and `Start_Line` commands.

AC1F722 - Error in @PASS_TO_HOST1 TUP

The TUP `@PASS_TO_HOST1` contains an error. The second line of the `put_string` command in the procedure does not contain the continuation ellipsis (..) that it should. The complete `put_string` command should read as follows:

```
put_string (puts) ..  
  string='define_passthrough_titles title = HOST1' ..  
  destination=connection
```

Also, to run the passthrough line in the preferred configuration of full 8 bit support and EIA flow control, the procedure should contain the following parameter specifications in the change terminal attributes command.

```
change_terminal_attributes (chata) ..  
  character_flow_control=off parity=none ..
```

AC1F724 - Garbled Output on Two Printer HASP Station

When a HASP station has two printers configured and active, garbling of output has been observed on one printer. In all cases observed it has been the first printer configured that has had the problem. Typically, the garbled output has been one or two lines in a 1500 line output. When running only one printer the problem has not been seen. The only workaround available at this time is to only configure one printer.

AC10184 - Batch Device Definition Parameters Not Processed Properly

The string values for the external characteristics (n) parameter (used for NOS/VE batch and NOS RBF devices) and the forms code (n) parameter (used for NOS/VE batch devices) are not processed properly in batch device definitions. An example of the batch device definition command follows:

```
define_batch_device (defbd) ..  
ext_characteristics_n='xxxxxx' ..  
forms_code_n='yyyyyy'
```

Where n represents a number from 1 to 4 and xxxxxx and yyyyyy represent a string 1 to 6 characters long.

To set these values for batch devices, take the appropriate action from the following:

- . For NOS/VE devices

Use the OPES CHABDA command to set the external characteristics or forms code values.

- . For NOS RBF devices

Use the RBF SET command with the TR parameter to set the external characteristics (i.e., train) value. (As usual, use the RBF SET command with the FC parameter to set the forms code value.)

- . For NOS PSU devices

As is the usual practice, the PSU FORM command should be used to set the forms code and the PSU TRAIN command should be used to set the train value.

AC1E002 - ANACD User Breaks - NOS/VE Only

On NOS/VE systems, a user break sequence (<ncc>2) on any subcommand terminates that subcommand and continues with ANACD. However, there is no specific user break condition handler so that a specified output file may sometimes be left open. This causes output from a subsequent subcommand to be added to the output file of the terminated subcommand.

AC1F486 - Cycle 1 Files Cause REPCF failure - NOS/VE Only

If cycle 1 of the following files exists, problems are encountered when replacing configuration files on NOS/VE systems with CDCNET.

```
$SYSTEM.CDCNET.SITE_CONTROLLED.CONFIGURATION  
$SYSTEM.CDCNET.SITE_CONTROLLED.EXCEPTION_LIST  
$SYSTEM.CDCNET.SITE_CONTROLLED.PROCEDURES.DEVICE_LOAD  
$SYSTEM.CDCNET.SITE_CONTROLLED.PROCEDURES.TERMINAL  
$SYSTEM.CDCNET.SITE_CONTROLLED.PROCEDURES.USER
```

The SCL CDCNET installation procedure:

```
REPLACE_CONFIGURATION_FILE
```

aborts with the following message:

```
-ERROR- Cycle 1 of file xxxxx already exists.
```

If the above error message occurs while running this procedure, either delete cycle 1, or change cycle 1 to another cycle number. This example shows how to change the cycle number of a file:

```
CHANGE_CATALOG_ENTRY $SYSTEM.CDCNET.SITE_CONTROLLED.CONFIGURATION.1 ..  
NEW_CYCLE=2
```

AC1F674 - Batch Device Errors Cause File Mix-up - NOS Only

For CDCNET batch devices on NOS, if certain kinds of errors occur while a file is being printed or read, some of the information from that file may appear with the data of the next file to be processed when the device becomes active again.

The following actions can cause this kind of error and should be avoided while a file is in the process of printing or being read:

- . Taking down the NOS host or the link to the host. For example, turning off the EST ordinal of the MDI containing the batch gateway.
- . Taking down the application supporting the device, such as RBF or PSU.
- . Making a BSC 3270 device not ready, or offline, or taking the cluster or station down (i.e., errors that cause the device, but not the line, to go down).

AC10199 - NPA and NOS COLLECT File Name Conflict - NOS Only

There is a potential file name conflict between CDCNET NPA files and the NOS COLLECT utility files. This conflict can occur if your site changes the default residence of NPU dump files from NETOPS to NETADMN, and the network invocation number (NIN) equals or exceeds the last three digits of the CDCNET build level at release. A subsequent COLLECT execution could result in the purging of NPA files NPAvvvv, NPBvvvv and NPEvvvv, where vvvv is the CDCNET version level.

CHAA190 - NETOU Aborts During Host Operator Log Out - NOS Only

The Network Operator Utility (NETOU) aborts if the Host Operator (HOP) has logged in through the CYBER console and the following conditions occur:

- . The K-display has been assigned to NETOU.
- . The HOP routed command responses or alarms to the same or to two different files through the ROUCR/ROUA command. The ROUCR/ROUA command can be entered by a command file, user prolog or interactively through the K-display.
- . The HOP logs out of NETOU using the command, LOGOUT, BYE LOGIN or any other logout command.

NETOU aborts when the logout occurs.

Notes and Cautions

The following items provide notes and cautions about CDCNET and associated hardware and software. They are intended to help avoid problems and difficulties in the operation, maintenance and use of CDCNET.

- Changes in NPA REFCLF
- MANCC Generates Unnecessary TDI/NDI Commands
- Async Passthrough Production Usage
- Echoing Delays Across Passthrough Connections
- Abort Output Delays Across Passthrough Connections
- Cursor Positioning Delays Across Passthrough Connections
- Transparent Timeout Values Decreased
- Rotary Support
- MANCC File Connections to \$ERROR - NOS/VE Only
- MDI/MTI Resets During Host Mainframe Maintenance - NOS/VE Only
- Support for BSC 3270 - NOS Only
- CDCNET DI as Only Network Hardware - NOS Only
- Password Masking Fails Without CDCNET Upgrade - NOS Only
- Continuous MDI Error Status Indicates MCI Failure - NOS Only

Changes in NPA REFCLF

The operation of NPA REFCLF in CDCNET release 1.1 and 1.2 differs from the operation described in the CDCNET Network Performance Analyzer Manual (publication 60461510). The following two items describe these differences.

1. The REFCLF parameter, SI (STATISTICS_INTERVAL), is accepted but is non-functional.

DIOS, ETHR, HDLC, MCIS, SESS and TERM statistics are no longer collected into records (condensed) by REFCLF. These statistics are merely written to their respective databases. NPA CRECAR will be changed in a future release to perform condensation.

NOTE

Since these statistics are commonly written to the log files at one hour intervals, CRECAR reports will show few changes (except as noted in item 2) If statistics are written to the log files at other than one hour intervals, the reports will reflect the same time interval.

2. Actual ending times (HHMM) are reported by CRECAR in its DIOS, ETHR, HDLC, MCIS, SESS and TERM reports. Times are not rounded up to the nearest hour. Also, there are no **** entries for missing time intervals.

MANCC Generates Unnecesary TDI/NDI Commands

When CRECF is used to create a system configuration file for a TDI, the following commands are included in the configuration file.

```
define_ether_net (defen)  
define_ether_trunk (defet)
```

These commands are also included in both TDI and NDI system configuration files created in the EDICF environment using the TDI and NDI configuration templates.

Neither of these commands is required in a TDI or NDI system configuration file, as they are performed implicitly by the TDI/NDI software load process. The presence of these commands in a configuration file does not adversely affect the loading and configuration process. However, log messages and operator alarms will be issued during configuration indicating that the trunk and network are already defined. Refer to the section "AC1F472 - Explicit Configurations Causes Log/Alarm messages" for more details concerning the impact of the explicit definition of networks or trunks that have already been defined implicitly.

NOTE

Both the define_ether_net and define_ether_trunk commands are required in the configuration file for a DI with an ESCI card that is not loaded over the ETHER trunk (e.g.,

an MDI that is loaded over the CHANNEL trunk), as the load process only performs the implicit trunk and network definition of the trunk and network over which the DI was loaded.

Async Passthrough Production Usage

Async Passthrough has been extensively tested with various CDC and non-CDC host mainframes and software. Experience has shown that it can be a complex process to configure and verify the correct operation of the network, host, and the terminal/PC linked by a passthrough connection. CDC therefore, strongly encourages sites to plan sufficient resources for verifying the operation of this feature. The site should start with limited usage so that problems with CDCNET configuration, cabling, host software configuration (system, application, and user software), and PC communication package configuration can be resolved in an orderly fashion before entering large scale production usage.

Echoing Delays Across Passthrough Connections

Users that utilize remote echoing, common with VAX (TM) systems, will notice longer echoing delays when using passthrough connections to the echoing systems. Future performance enhancements will address this problem.

Abort Output Delays Across Passthrough Connections

Users that issue commands to remote systems to abort output will notice that output will not be terminated until all of the data in the passthrough connection has been displayed at the terminal. The exact amount of data varies from one to many screen fulls. Future enhancements will minimize the delay.

Cursor Positioning Delays Across Passthrough Connections

Host systems which implement cursor positioning delays by suspending output transmission cannot expect these delays to reliably pass through a network. The more networks involved the more likely this problem will be encountered. In particular this problem will very likely be seen if a Async Passthrough connection is made to a host that performs cursor positioning delays by suspending output. The only delays that can be expected to work in the network environment are those that are implemented by sending NUL characters for the desired time delay interval.

Transparent Timeout Values Decreased

The transparent timeout value associated with the transparent_timeout_mode is decreased from 400 milliseconds to a line speed dependent value in the range of 40..400 milliseconds. This can cause problems for intelligent terminals/PCs which are dependent on the full 400 millisecond timeout.

Rotary Support

CDCNET is currently not capable of "busying out" modems. If a communications line connected to a rotary is taken out of service, the rotary will become blocked, resulting in a ring with no answer. If a line within a rotary must be taken out of service, the modem should be manually busied out. Refer to the modem documentation to determine how to do this.

MANCC File Connections to \$ERROR - NOS/VE Only

Only the last MANCC error message is saved in the connected file when the output of the \$ERRORS file is directed to another file. The following NOS/VE SCL command is used to create the file connection:

```
CREATE_FILE_CONNECTION
```

To receive all error messages for a MANCC session in an external file, the output of both the \$ERRORS and \$RESPONSE files should be directed to the same external file. Specify a file position of \$EOI as part of the file reference. The following example connects standard files \$ERRORS and \$RESPONSE to file \$LOCAL.NCERRORS. The file is positioned to the end of information prior to its use.

```
CREFC $ERRORS      $LOCAL.NCERRORS.$EOI  
CREFC $RESPONSE    $LOCAL.NCERRORS.$EOI
```

MDI/MTI Resets During Host Mainframe Maintenance - NOS/VE Only

CYBER 180 channel-connected CDCNET systems (MDI or MTI) interfacing with NOS/VE standalone mainframes may reset when the connected host is down for maintenance. Actions that have caused this to happen include mainframe power-down/power-up sequences or loading a new level of CIP firmware. If the mainframe under maintenance is the only mainframe connected to the MDI or MTI, there is no user impact or problems with other CDCNET devices or mainframes when this problem occurs. The reset results in a dump and reload of the channel-connected Device Interface at the completion of NOS/VE deadstart and NAM/VE initialization on the mainframe that was down. The time the reset actually occurred is recorded in the DI's System Configuration Table. This table can be accessed with the following CDCNET Dump Analyzer command:

display_system_config_table (dissct)

The reset time can be used to confirm that the DI reset was the result of a maintenance action.

If the MDI or MTI connected to the mainframe under maintenance has multiple MCIs and is connected to other active mainframes, this problem interrupts communications with the active mainframe. If this occurs, contact Control Data Engineering Services and request installation of Field Change Order (FCO) 17970 for the affected MCI.

Support for BSC 3270 - NOS Only

The BSC 3270 capability is supported only on NOS in this release. We (CDC) have tested with a variety of BSC 3270 configurations and emulator packages, however, the overall general exposure and production use of this capability by experienced BSC 3270 users has been limited. In order to allow us to expand our knowledge of how our sites are configuring and using the BSC 3270 capability, we would encourage sites to communicate to CYBER Systems Support the types of usage they are making of this product and any difficulties encountered bringing it up in production.

CDCNET DI as Only Network Hardware - NOS Only

CDCNET accounting information is written to the NOS account file by the Communications Supervisor (CS); additional types of information are written by CDCNET to log files created by the Network Log Server (NETLS). Therefore, even if no Network Processing Units (NPUs) are present in the communications subsystem, CS must run if these account file messages are to be generated. CS does not initialize unless a Network Configuration File (NCF) is present. CDCNET-only systems need to generate a dummy NCF to enable logging of NOS account messages. A dummy NCF can be generated by using the following source input to the Network Definitions Language Processor (NDLP).

```
NCFFILE : NFILE.  
END.
```

The file NCFFILE generated by NDLP should be a permanent, direct access file of the same name under user name NETADMN.

If a CDCNET-only site does not want the NOS account file messages to be generated, then the CS job should not be submitted when NAM is started. This is done by changing the JOB statement for JOBCS in all PARAM records (INIT-MRECOV) in the NAMSTRT file under user name NETOPS to include the DI parameter. This change prevents the CS job from being submitted when NAM is initiated. For example:

JOB(JOBBS,CS,DI,SY,NS) CS JOB.

If the CS job is initially disabled, it is still possible to start the logging of NOS account file messages by a manual call to NAMI, with the RS option, after NAM has been initiated.

NS is not required in a CDCNET-only configuration. The NAMSTRT JOB statement can be modified to include the DI parameter as follows:

JOB(JOBNS,NS,DI,SY,NS) NS JOB.

Note that this change should only be made if no NPUs are present. This must be done in all PARAM records (INIT-MRECOV).

For more detailed information on the NCFFILE and JOB statements, refer to the NAM5/NAM5D section of chapter 7 in the NOS 2 Installation Handbook (IHB) revision J (publication 60459320).

Password Masking Fails Without CDCNET Upgrade - NOS Only

If a site runs NAM level 678 but does not upgrade CDCNET, the user password will not be masked out at login time. The Network Validation Facility (NVF) has been modified not to send the CTRL/CHAR service message to the TIP to turn off cursor positioning. Instead NVF sets the "no cursor positioning next input" (NCPNI) bit in the DBC. CDCNET prior to level 678 does not have logic to act on the NCPNI request and will perform cursor positioning following the entry of the password. There will be no problem running with a pre-L678 NAM and L678 CDCNET, because in L678, NVF sends the CTRL/CHAR service message to the TIP to turn off cursor positioning.

Continuous MDI Error Status Indicates MCI Failure - NOS Only

The error message 'MDI ERROR STATUS RECEIVED' is displayed when a problem is encountered with the MCI card in the DI. If continuous MDI ERROR STATUS RECEIVED messages appear in the NAM dayfile, the MCI board should be replaced.

Configurations

This section contains information about the configuration of CDCNET hardware and software. The following is a list of the topics found in this section.

- Changes Affecting Configurations for This Release
- Changes to Released Terminal User Procedures (TUPs)
- Changes to Released Terminal Definition Procedures (TDPs)
- Changes to Released DI Configuration Procedures
- TUP Support Limitation on HASP and BSC 3270 Protocols

- Default Buffer Allocation Parameters Recommended
- CIM Configuration Limitations
- BSC 3270 Device Configuration Limitations
- Configuration to Avoid Delays from Dynamic Loading of TIPs
- Passthrough Physical Connection Configuration
- Configuration of passthrough for XMODEM Usage
- X.25 Configuration
- Loading New Configuration Files - NOS/VE Only
- New CDCNET File Type - NOS/VE Only
- URI TIP Configuration for 585 Printers - NOS/VE Only
- Loading New Configuration Files - NOS Only
- CYBER 120 File Configuration - NOS Only

Changes Affecting Configurations for This Release

New features and changes in this release may affect previously defined configurations. The following items explain some of the changes which may require configuration changes.

- . In networks with mainframes at both old and new CDCNET levels, new configuration files may not be compatible with old boot files. For example, if a TDI or NDI configuration file contains command parameters exclusive to CDCNET release 1.2, but the DI gets loaded from a host running a CDCNET release 1.1 library, the command processor is not able to process the new commands in the configuration file.

Take care in configuring mixed networks to avoid load paths where situations such as the above can happen.

- . The following CDCNET commands are no longer supported on NOS and NOS/VE dual-state systems:

```
start_np_ivt_gw (stanig)
stop_np_ivt_gw (stonig)
```

These commands should be replaced with the following commands in any configuration files to be used with this release.

```
define_np_terminal_gw (defntg)
stop_np_terminal_gw (stontg)
cancel_np_terminal_gw (canntg)
```

- . The default carrier type for all line types (async/sync) is "constant". For the normal operation of synchronous dial-up lines through modems, the carrier type must be "controlled". In previous CDCNET releases, the setting of this parameter had no effect. No matter how the lines were defined, they worked exactly as if the carrier type had been specified as controlled. This has been corrected in this release. Configuration files should be checked for the omission or incorrect specification of this parameter. For synchronous lines requiring "controlled" carrier type, be sure to specify the carrier type parameter on the define line

command as follows:

```
define_line (def1) carrier_type=controlled
```

Changes to Released Terminal User Procedures (TUPs)

The following TUPS are new:

- . DEC_VT220 for a DEC VT220 terminal.
- . MAC_CONNECT_11 for a Apple Macintosh computer using CONNECT version 1.1.
- . PC_CONNECT_12 for a IBM PC or compatible using CONNECT version 1.2.
- . @PASS_TO_HOST1 shows usage of the Asynchronous Terminal Passthrough product.

NOTE

The TUP @PASS_TO_HOST1 contains an error. Refer to the section "AC1F722 - Error in @PASS_TO_HOST1 TUP" in the Significant Problems section of this chapter for a complete description of the problem.

The following TUPS were renamed in support of NOS/VE's terminal model naming conventions:

- . CDC721 -> CDC_721
- . CDC722 -> CDC_722
- . CDC722_30 -> CDC_722_30
- . VT100 -> DEC_VT100
- . Z19 -> ZEN_Z19
- . Z29 -> ZEN_Z29

The following TUPs were changed:

- . The Z19 and Z29 TUPs (now ZEN_Z19 and ZEN_Z29) were changed to correct the form feed sequence.

Changes to Released Terminal Definition Procedures (TDPs)

The following TDPs are new:

- . NOS_3270_STATION is used to configure an IBM BSC 3270 work station logged into a NOS host.
- . URI_PRINTER_1 is used to configure a Unit Record Interface (URI) printer such as the CDC 585 that is operated from a NOS/VE host.

The following TDP has been modified:

- . IO_STATION_1 now shows the definition of a card reader configured in the HASP work station.

Changes to Released DI Configuration Procedures

The released DI configuration procedures have been modified to show examples of the define_line commands used for the new features in CDCNET. Specifically, new define_line commands have been added for the URI printer (CDC 585), asynchronous terminal passthrough, and for NOS only an IBM BSC 3270 station.

The released procedures also use the new format for DEFINE_SOURCE_LOG_GROUP and DEFINE_SOURCE_ALARM_MESSAGE. The default set of message numbers for logs and alarms is now controlled in the DI software. Because of this, it is undesirable to specify the numbers in the configuration procedure. Sites who are upgrading are strongly encouraged to remove the specific message numbers from their configuration files.

TUP Support Limitation on HASP and BSC 3270 Protocols

One form of help CDCNET provides for configuring terminals, printers, workstations, and other network equipment is sample configuration files. Sample Terminal User Procedures (TUPs) and Terminal Definition Procedures (TDPs) are provided for all the currently available Terminal Interface Procedures (TIPs) except HASP and 3270. The sample TDPs for HASP and BSC 3270 stations are configured according to the standards universally accepted for these protocols. TUPs are not provided for HASP or BSC 3270 since these protocols do not generally encompass different terminal classes and only a limited set of interactive attributes are supported.

Default Buffer Allocation Parameters Recommended

The released default settings for buffer sizes, buffer percentages, various memory and buffer congestion thresholds and stack sizes should be used whenever possible. These parameters are specified in configuration files by the command:

```
define_system (defs)
```

Some non-default settings of these parameters may cause difficulties.

CIM Configuration Limitations

With one exception, CDCNET allows only a single Terminal protocol to be supported by a Communications Interface Module (CIM); ASYNC only, HASP only or URI only, for example. The exception is the specific combination of ASYNC and HDLC. To change protocols, modify or replace the DI configuration file to support a different protocol and reset the DI.

BSC 3270 Device Configuration Limitations

Currently, a BSC 3270 device will not work on LIMs 6 and 7. The `define_line` command specifically rejects line definitions specifying `tip_name = BSC3270` (3270 TIP) and `lim = 6` or `lim = 7`.

Configuration to Avoid Delays from Dynamic Loading of TIPs

If a TIP is not loaded as part of the initial DI load process, the first asynchronous user is likely to encounter a long delay (up to a minute in a heavily loaded system) before the terminal is recognized. The delay is due to the dynamic loading of the TIP. To avoid such delay, include the load module command in each TDI/MTI configuration file. Here is an example of a load module command for the Async. TIP:

```
load_module (loam) asynctip_module
```

This does not have any negative impact on memory usage or allocation.

Passthrough Physical Connection Configuration

The passthrough feature allows different terminal users to access the same passthrough port at different times. This "sharing" of the same port requires that each user must be completely disconnected before the next user is allowed access to the port. A complete disconnect is required to ensure that a new user does not accidentally get connected to a previous user's login session and file base. CDCNET signals a disconnect to the connected equipment by dropping its DTR output signal. CDCNET recognizes a disconnect by sensing a drop in its DSR and/or DCD input signals. The physical connection between the passthrough port and connected device must be configured so that CDCNET's disconnect signal is detected and processed as such by the connected equipment and propagated to the end system. If not, new users are connected to the previous user's login session and file base. The physical connection between the passthrough port and connected device must also be configured so that the disconnect signal initiated by an end system is detected and processed as such by CDCNET. If not, the passthrough

port will not be made available by CDCNET for new passthrough users.

Configuration of passthrough for XMODEM Usage

XMODEM file transfers require full 8-bit transparency. The passthrough port supporting XMODEM transfers must not be configured with XON/XOFF flow control; EIA flow control is recommended. The passthrough port must also be configured with PARITY=NONE. If the passthrough port has a line speed less than 9600 bps and is used for NOS/VE XMODEM, the TUP for the passthrough port must include the following command after the "crec passthrough" command:

```
change_connection_attribute (chaca) transparent_message_length=135
```

X.25 Configuration

The following are General X.25 Network Configuration Recommendations

- . Small packet sizes should be used with X.25 links connected by modems. A maximum default packet size of 256 is recommended for this parameter in the command:

```
define_X25_interface (defxi), default_packet_size=n
```

- . The default value of the pf_recovery_timer parameter (prt=500) in the command:

```
define_X25_trunk (defxt)
```

is recommended only for 56000 bps trunk speeds. The value specified should provide sufficient time to transfer the maximum size packet at the specified line speed and receive an acknowledgement. Experience with a specific application may be needed to determine a suitable value for the prt parameter. As a general example, a prt value of 7000 was used when testing a 4800 bps trunk.

- . For directly connected X.25 links (links that do not go through a PDN) without modems and using RS232 LIMs, the clocking parameter should be set to "transmit" in the command:

```
define_X25_trunk (defxt), clocking=transmit
```

The clocking parameter must be set to external (default) when using modems.

- . For directly connected X.25 links that use RS449 Model A LIMs without modems, hardware setup and strapping may be required to activate internal clocking. This should be done by Customer Engineering Support during hardware installation. When using directly connected links without modems, only the DTE configured end of the trunk should be strapped for internal clocking. The associated NDI's configuration file should specify transmit clocking, as in the previous example, when using

directly connected links without modems. The LIM at the DCE end of the trunk should be defined to have "external" clocking (default). This RS449 LIM port must be strapped for external clocking.

- . For directly connected links using RS449 Model A LIMs with modems, strapping of the LIMs is required to activate external clocking. This should be done by Customer Engineering Support during hardware installation. Both ends of the trunk should be strapped for external clocking. The NDI's configuration file should specify external clocking (default).
- . Defining large values for range parameters and/or default packet size may cause depletion of buffer resources. If NDI buffer status indicates buffer status other than good, reduce the value of these parameters in the NDI configuration files until a good NDI buffer status can be maintained. The following command issued from the Network Operator Utility (NETOU) displays the NDI buffer status:

```
display_di_system_status (disdss)
```

Following is an example of test configuration files used for X.25 Network Solution testing with RS449 LIMs at 56KB. Port 0 was strapped for internal clocking. Port 1 was strapped for external clocking on both LIMs.

```
define_system (defs), system_name=ndi_remote
define_x25_trunk (defxt), lim=0 port=1 trunk_name=remote_trunk ..
    mode=dce clocking=external retransmission_limit=20 ..
    trunk_speed=56000
define_x25_interface (defxi), interface_name=remote_pl ..
    trunk_name=remote_trunk twoway_range=(1..32) ..
    public_data_network=ve_test local_DTE_adress='3' ..
    default_packet_size=256
define_x25_net (defxn), trunk_name=remote_trunk ..
    network_ID=3456(16) remote_DTE_adress='1' ..
    network_name=remote_ns
define_system (defs), system_name=ndi_local
define_x25_trunk l=0 p=0 tn=local_trunk m=dte c=transmit rl=20 ..
    ts=56000
define_x25_interface in=local_pl tn=local_trunk tr=(1..32) ..
    pdn=ve_test lda='1' dps=256
define_x25_net tn=local_trunk ni=3456(16) rda='3' nn=local_ns
```

Loading New Configuration Files - NOS/VE Only

The upgrade installation process will not automatically add the new TUPs, TDPs, or VLP to their working libraries (\$SYSTEM.CDCNET.SITE_CONTROLLED catalog). To have them updated you must follow these instructions:

To update the libraries in the catalog

\$SYSTEM.CDCNET.SITE_CONTROLLED

procedures must be copied from the catalog

\$SYSTEM.CDCNET.VERSION_vvvv.SITE_CONTROLLED

where vvvv is the CDCNET release version level.

Commands must be executed either from the system console or from a terminal logged into a user name which has permission to update the catalog

\$SYSTEM.CDCNET.SITE_CONTROLLED

This example adds the new PC_CONNECT_12 TUP to the existing TUP library:

```
CREOL
  ADDM L=$SYSTEM.CDCNET.SITE_CONTROLLED.PROCEDURES.USER
  ADDM L=$SYSTEM.CDCNET.VERSION_vvvv.SITE_CONTROLLED.PROCEDURES.USER ..
      M=PC_CONNECT_12
  GENL L=$SYSTEM.CDCNET.SITE_CONTROLLED.PROCEDURES.USER.$NEXT
  QUIT
```

Replace "vvvv" with the released CDCNET version level.

To create the new file, DEVICE_LOAD, execute the following command from the system console or from a terminal logged into a user name which has permission to update the \$SYSTEM.CDCNET.SITE_CONTROLLED catalog.

```
COPF $SYSTEM.CDCNET.VERSION_vvvv.SITE_CONTROLLED.PROCEDURES.DEVICE_LOAD ..
  $SYSTEM.CDCNET.SITE_CONTROLLED.PROCEDURES.DEVICE_LOAD.2
```

Replace "vvvv" with the released CDCNET version level. It is very important to create the new file starting with cycle 2 to ensure the proper functioning of the command:

REPLACE_CONFIGURATION_FILE

New CDCNET File Type - NOS/VE Only

In support of the CDC 585 printer, a new CDCNET file type, LOAD_PROCEDURE has been added for this release. It allows the site to control the formatting of printer output utilizing the Vertical Format Unit (VFU) capabilities of the CDC 585 printer. The format is controlled via a VFU Load Procedure (VLP) that is sent to the printer. The default VLP is named CDC_VFU. VLPs are stored in the SCL procedure library

\$SYSTEM.CDCNET.SITE_CONTROLLED.PROCEDURES.DEVICE_LOAD.

For NOS/VE sites that specify specific file types on the command

ACTIVATE_NETWORK_FILE_ACCESS

This command is contained in the command file

\$SYSTEM.NETWORK_STARTUP_COMMANDS.

you will need to alter the list of file types in order to use the VFU load procedures. If you are using the release defaults, no changes will be necessary.

The commands

ATTACH_CONFIGURATION_FILE
REPLACE_CONFIGURATION_FILE

have been updated to accept VLP as a file/procedure type.

URI TIP Configuration for 585 Printers - NOS/VE Only

When defining a communications line that will use the URI TIP to support a CDC 585 printer, the line type should be defined as dedicated. The following example shows how the line type should be specified.

```
define_line, (def1) line_type=dedicated ..
```

If the line type is defined as switched or if the line type parameter is omitted, thus defaulting to switched, the following problems can occur:

1. If there are periods of inactivity, between printing files, the printer line will occasionally be automatically stopped and restarted. Any batch device attributes, made by the operator since the last time the line was started, will be lost.
2. If the printer is powered off, there could be an extremely large number of messages sent to the log file or sent as alarms to the operator.

With a dedicated URI printer line, a power-off condition will still cause log messages to occur, but less frequently (about every two minutes) than with a switched line. If a printer is going to remain powered off for long periods of time, the line should be stopped with the CDCNET stop_line (stol) command.

Loading New Configuration Files - NOS Only

Two new files are loaded to user name NETADMN as part of the the installation of CDCNET. Their names are TUPvvvv and TDPvvvv (vvvv is the CDCNET version level). They contain all of the released terminal user procedures and terminal definition procedures, respectively. The files are in ASCII 6/12

format.

You may update the network directory with the new procedures by using the Full Screen Editor (FSE) to copy selected procedures out of the above files, and add them to the NETDIR using the DEFCF procedure.

Alternatively, you may add all of the new procedures (not those that have changed names) to the NETDIR in one operation. This can be done at the time you perform the upgrade on user name NETADMN.

Follow the normal upgrade instructions for CDCNET documented in the NOS Installation Manual (60459320). After you have entered the following command:

```
BEGIN,UPGRADE,DCNPLIB,NETADMN.
```

enter this command before logging out or returning any files:

```
BEGIN,INSCS,DCNPLIB,NEW.
```

This command will add the new procedures to your NETDIR file.

CYBER 120 File Configuration - NOS Only

In order to get the outcall blocks from a NOS system to be answered by a CYBER 120 AOS gateway system, the Network Process Name (NPN) file on the CYBER 120 system (PTFSAOS) must be modified. Select option 5, "Manage NPN Configuration", from the AOS XODIAC menu. Change the second hexadecimal coded character pair in the NPN file (PTFSAOS) to 80 so that the value C00000.. becomes C08000..

Operational Considerations

This section contains information about the operation of CDCNET and its supporting utilities. The following items describe operational considerations for CDCNET:

- ANACD - Changes in Dump Analyzer Operation
- Managing Passthrough/Foreign Host Flow Control Modes
- New Procedure Required For Disconnected ETHERNET Cable
- Operational Changes for The New Failure Management Feature
- Network Status Display Changed for Release 1.2
- Recommendations for Defining Log Groups
- Global Variables and ANACD, MANCC and NPA - NOS/VE Only
- NAM/VE Attribute Management Differences - NOS/VE Only
- CDCNET Operational Changes For This Release - NOS Only

ANACD - Changes in Dump Analyzer Operation

Dump Analyzer numeric parameter values, particularly memory addresses, may now be entered in hex without specifying the radix. This saves time entering ANACD subcommand parameters during interactive use. Entering numbers with a specified radix still works as before. Entering decimal numbers, however (such as repeat counts), now requires a radix suffix of '(10)' to be interpreted as decimal. Input directives files where the radix on a number was already specified need not be changed. Where a radix was not specified, subcommands on a directives file interpret numbers as decimal before CDCNET release 1.2 and as hex after release 1.2. Thus any numeric parameter values on existing input directives files that do not have a radix specified and are greater than 9 must have the radix suffix '(10)' added to make them perform the same in CDCNET release 1.2. This work is expected to be minimal since most of the numeric values are addresses and these are invariably quoted in hex and already have a radix specification. The other numeric parameters are repeat counts. Repeat counts are normally smaller than 9, or if not then small enough such that a radix change does not significantly impact the output, even if the directives files are not upgraded.

A new parameter, `display_option`, is added to the following ANACD subcommands for this release:

```
display_buffer_chain (disbc)
display_data_queue (disdq)
display_task_control_block (distcb)
validate_stack_areas (valsa)
```

The values that may be specified for the `display_option` parameter are "full" and "brief". This parameter takes the same position as the output parameter for previous releases of these subcommands. The output parameter, by convention, remains the last on the list before status. The impact of this change is expected to be small but user input directives files may have to be checked if positional notation is used for the output parameter.

The "brief" display option, for the commands listed above, is a summary rather than the full data display output. Prior to this release, only the full display was available. The `disbc` and `disdq` subcommands default to the full display as before however, since the full display for the `distcb` and `valsa` commands can be time consuming and lengthy, they now default to the brief display. The use of these commands in directive files should be reviewed. In most cases, the brief displays are expected to be the most desirable for batch input.

Managing Passthrough/Foreign Host Flow Control Modes

Passthrough testing has shown that some host terminal drivers and some host applications transmit XOFF characters to stop input but never restart it by sending XON characters. This behavior will lock up passthrough ports that have been configured with character flow control on.

In order to avoid this problem it is suggested that passthrough ports to such hosts should be configured with character flow control off. This will cause such XOFF characters to be transmitted through the passthrough network to the terminal, allowing the terminal user to recover from the XOFF by unlocking the keyboard, etc.

To recover from a passthrough port which has been locked up in this manner, the passthrough port must be stopped and restarted using the Stop_Line and Start_Line network operator commands.

New Procedure Required For Disconnected ETHERNET Cable

Prior to this release one could recover a disconnected ETHERNET by reseating the cable with no interruption to the ESCI subsystem. With this release a disconnected ETHERNET causes the ESCI subsystem to be shut down. The network can be restarted by issuing the following CDCNET commands from NETOU:

```
change_element_state dn = $esci(value) s = on
start_network network_name = (name)
```

The terms "value" and "name" refer to configuration specified parameters. If there is only one ESCI link to the rest of CDCNET the DI probably has to be reset since it will not be able to load these commands.

Operational Changes for The New Failure Management Feature

The Failure Management Feature, new with this release, implements two noteworthy changes affecting the operation of CDCNET.

1. A new DI reset code (3F) has been added
2. SMM detected bus parity errors cause a DI to reset.

DI Reset Code 3F

The Failure Management Feature adds several new log messages. One of which is the DI reset code (3F). The new code represents the hard_failure error. A failure is said to be "hard" if the damage done by it cannot be undone. The cause can be hardware or software related.

In some cases, the 3F code might replace the old 18 code which represents the following error:

```
task_error_no_recovery_proc
```

A likely example of this might be a bus error caused by a program attempting to reference a non-existent location.

If the 3F reset code appears in a DI dump, use the following command to examine the Executive Error Table for clues to the problem.

```
display_executive_error_Table (diseet)
```

DI Reset After SMM Detected Bus Parity Error

Failure Management code differentiates SMM detected bus parity errors from SMM single and double bit errors. Error processing associated with the bus parity error hardware problem differs from that of previous releases.

Previously, the bus parity problem was treated as an SMM single bit error. An SMM single bit error counter was incremented and after every 20 occurrences, an SMM single bit error (log message 10) was logged.

With this release, the DI resets immediately with a reset code of 3F(16), hard_failure, should this problem occur. The error type saved in the Executive Error Table can be displayed using the diseet subcommand as shown in the previous example.

The diseet command has been enhanced to report the error as "smm detected bus parity error". In addition, the following sequences of messages will appear in the log file when this problem occurs: 1228, 1179, and 342. These messages are reported in the NPA hardware report, HRDWRP1. A sample NPA hardware report is shown below:

7-28
CDCNET

NOS 2.5.2 L678/670 SRB
Operational Considerations

NETWORK PERFORMANCE ANALYZER
VERSION 1.10/2801
HRDWRP1 REPORT

RUN DATE: 4/02/87
87/04/01 0000 - 87/04/01 2400
REPORT DAY: 87/04/01

CDCNET HARDWARE MESSAGES
SORTED BY DATE AND TIME

DATE	TIME	SYSTEM ID	LOG ID	SEVERITY
87/04/01	19.55.56020	080025300070	1228	CATASTROPHIC
--CATASTROPHIC-- DI RESET INDICATION. RESET CODE: 003F				
SUBSYSTEM CARD SLOT = 2				
REASON: SUBSYSTEM HARD FAILURE				
87/04/01	19.55.56026	080025300070	1179	ERROR
--ERROR-- DATA PARITY ERROR; ACCESS TYPE = ITB WRITE				
DETECTION BY SMM ERROR INTERRUPT				
SUBSYSTEM CARD SLOT = 2				
REPORTED AFTER RESET				
87/04/01	19.55.56154	080025300070	342	ERROR
--ERROR-- SMM MULTIPLE BIT ERRORS OCCURRED				
DURING INITIALIZATION.				
SLOT NUMBER= 2				
ERRORS= 1				
ERROR LOG= 0443				
87/04/01	19.56.36929	080025300070	19	INFORMATIVE
CONFIGURATION COMPLETE,				
CONFIGURATION FILE SOURCE:				
NETWORK ID: 00000000, SYSTEM ID: 080025300070				

The SMM hardware writes a multibit error into the location being written to when a bus parity error is detected. The subsequent execution of onboard diagnostics, after the DI resets, detects this multibit error and issues log message 342. In this particular scenario, it is not usually an indication of a SMM multiple bit error. For additional help in diagnosing these conditions, contact Control Data CYBER Systems Support (CSS).

Network Status Display Changed for Release 1.2

The status response for the following command has changed for this release:

```
display_network_status (disns)
```

Prior to Release 1.2, the response for a not started (or stopped) network was a status of "configured". For Release 1.2, a status of "enabled" indicates this condition.

For HDLC and X.25 networks, "enabled" indicates one of two conditions:

1. The network is not started (or stopped).
2. The line to the other DI from this network is broken or the network has not started on the other DI.

The cause of the "enabled" response can be determined by issuing the following command:

```
display_hardware_status (dishs) display_option=expanded
```

the "device_name" response specifies the "device name" for which the hardware status display is being provided. Returned status and their meanings corresponding to the descriptions above (1 and 2) are as follows:

1. configured - the line is not started
2. enabled - the line is broken or the other side is not started

Recommendations for Defining Log Groups

CDC recommends that sites define one primary and at least one backup log recorder whenever possible. If a site chooses to define multiple log groups, one primary and at least one backup log recorder should be defined for each log group. Here are some points on the definition of primary and backup log recorders.

- . A NOS/VE system can be configured as a log recorder by the following NOS/VE command:

ACTIVATE_NETWORK_LOG (ACTNL)

Refer to the NAM/VE section of the NOS/VE SRB for information on changes to the priority parameter at this release.

- . A NOS MDI or MTI can be configured as a log recorder by the CDCNET command:

```
define_recorder_log_group (defrlg)
```

- . The primary log recorder for a NOS/VE system, NOS MDI or NOS MTI is the one defined with the highest priority (the default and highest priority is 1). Backup log recorders are those defined with lower priorities.
- . All NOS MTIs should be defined as log recorders with the default priority.

One NOS/VE host or one MDI connected to a NOS host should be defined as the primary log recorder for the network. If there are any other NOS/VE hosts or NOS MDIs in the network, at least one of these should be defined to provide backup for the primary recorder. Whenever more than one backup log recorder is defined for a log group, a different priority should be specified for each. Redundant logging (multiple log recorders in the network defined with the same priority) is NOT recommended since it adds overhead in the form of DIs generating log messages (log sources) and network traffic, and increases permanent file space usage on the host.

When analyzing problems from DIs in a multi-host environment, log files from the hosts with backup log servers must be obtained. The log files may be reformatted and reports generated separately for each host. The log files from the backup host may be moved to the primary host so that a single set of NPA data bases and reports can be generated. If log files are moved to the primary host, log file names may need to be unique (log file names on the backup host may be the same as those on the primary host).

NOTE

Take care when reformatting log files from different hosts to avoid loss of data. Refer to the description of PSR number AC1E105 in the previous section on significant problems.

Global Variables and ANACD, MANCC and NPA - NOS/VE Only

ANACD, MANCC, and NPA operate as command utilities on NOS/VE. Because the commands used to invoke the utilities are SCL procedures (which execute lower level CYBIL programs), SCL variables cannot be referenced from inside the utility without the proper variable scope declaration. This can be of particular importance when a utility is invoked from a procedure where status variables are commonly used to control procedure flow. The following sequence does not work:

```
CREATE_VARIABLE LOCAL_STATUS K=STATUS  
npa  
CREATE_DATABASES STATUS=LOCAL_STATUS
```

An error is generated at this point because local_status is NOT known inside the utility.

To gain access to SCL variables inside the CDCNET host utilities, use one of the following methods:

1. To reference a variable created before the utility is invoked, the variables must be declared outside of the call to the utility with a scope of XDCL or JOB. The variables should be declared again from inside the call to the utility with a scope of XREF. This allows access to the variables from within the utility. For example:

```
CREATE_VARIABLE LOCAL_STATUS K=STATUS S=XDCL  
NPA  
CREATE_VARIABLE LOCAL_STATUS K=STATUS S=XREF  
CREATE_DATABASES STATUS=LOCAL_STATUS  
"Process the local_status variable."  
QUIT
```

2. To use a variable solely from within the utility, it must be declared after the command utility has been invoked, rather than outside of the utility. For example:

```
NPA  
CREATE_VARIABLE LOCAL_STATUS K=STATUS  
CREATE_DATABASES STATUS=LOCAL_STATUS  
"Process the local_status variable."  
quit
```

NAM/VE Attribute Management Differences - NOS/VE Only

There are a number of differences between the CDCNET and NAM/VE attribute management commands, e.g. chata, chaca, dista, disca, etc.

NAM/VE maintains a separate set of terminal and connection attributes for every instance of a terminal file open. As a result, the NAM/VE attribute management commands have a filename parameter to identify the target set of attributes to be changed.

In NAM/VE, connection attribute management is an application function and it is strongly suggested that connection attributes not be changed by terminal users.

CDCNET and NAM/VE use different syntax for specifying values for attributes that can have a value of a character, a list of characters, or a string of characters. The following table highlights the NAM/VE and CDCNET supported syntax:

SYNTAX	NAM/VE	CDCNET
'a'	Y	Y
'ab'	Y	N
ETX	N	Y
('a','b')	N	Y
'a'// 'b'	Y	N
33(8)	N	Y
\$CHAR(33(8))	Y	N
↑c	N	Y

Because of the different syntax, the displayed values for attributes are different between CDCNET and NAM/VE. Also, NAM/VE integer values are displayed in decimal while CDCNET displays integer values in hexadecimal. NAM/VE utilizes lower case in its displays, while CDCNET uses upper case exclusively.

CDCNET Operational Changes For This Release - NOS Only

New features and changes affect the operation of CDCNET on NOS systems with this release. The following are explanations of these changes and recommendations for their utilization.

- . New CDCNET messages received at a host with an operating system level of 670 or older are not formatted with their appropriate templates. The new templates are part of the NOS Network Products delivered with the NOS operating system, not CDCNET. When upgrading to CDCNET release 1.2, it is preferable to upgrade all the mainframes in the network to NOS 2.5.2 level 678 operating system. If this is not feasible, it is recommended to upgrade at least one mainframe to the new NOS level and use it for network operations interface. The host utilities, such as MANCC, NPA, and NETOU can still be used on a previous version of NOS, however some messages may be displayed using the default templates.
- . NETFS, INITMDI and the CDCNET Collector (CLCDCNT) now access the Network Directory (NETDIR) from the application's or utility's current username (the username of the startup jobs, determined by NAMI's username parameter).
- . The network file manager, NETFM, no longer defaults to look in username NETOPS for the network directory file, NETDIR. Any site procedures which have been written to use NETFM should be changed to specify the UN=NETOPS parameter. This change will not affect current operations. Here is an example of how a command might appear before the change is made:

```
NETFM(Z)/ATTACH,NF=USER_PROCEDURE#CDC721
```

This is how the same command should appear after the change:

NETFM(UN=NETOPS,Z)/ATTACH,NF=USER_PROCEDURE#CDC721

NETCDA's (NETFM program interface routine) username field will still accept the old default (0 = current) and will now accept '\$CURRENT' and '\$DEFAULT' (specifying the current username and NETOPS respectively). The keyword UN will imply UN=NETOPS. The use of the NETFM utility is documented in the CDCNET Configuration and Site Administration Guide Manual (60461550)1.

DI Memory Requirements

This section describes the following:

- General Considerations
- Supported Configurations
- Types of Memory
- Requirements by DI Type
- Trunk Requirements
- CIM Limitations

This section supersedes any memory requirements guidelines for CDCNET release 1.1. With respect to release 1.2, this section both adds memory requirements for new features and improves estimates for previously released features. In particular, the memory requirements per active connection are improved from 4K per connection to 1K per connection. At release 1.1, there was some uncertainty as to the DI resources needed to support multiple interactive connections for each interactive terminal. To ensure that multiple connections would not uncover memory problems in the field, the memory requirements per connection were heavily padded. Since release 1.1, the need for that padding has shown to be unwarranted, hence that padding has been removed.

The memory required for the base release 1.2 DI system has increased by about 12K bytes from that required for the CDCNET 1.1 release. The base system size increased due to the addition of features common to all DI configurations. Similar increases may occur for later releases. For release 1.3 CDCNET, an increase of 30K bytes is expected.

General Considerations

As with other computer systems, the size of configuration supported by a DI system is determined both by the memory installed in the system and by the processing needed to service the configuration. Typically, if the amount of memory installed in a system is small, memory establishes the limits of configuration. If the amount of memory installed is large, processing establishes the ultimate limits to configuration. However, the amount of memory needed for configuration varies by DI type, with some types requiring larger amounts of memory than others. The types requiring the smallest amounts of memory are limited by processing rather than memory requirements.

Essentially, two issues determine the memory requirements for a DI system. The first issue is the type and number of devices connected to the DI. This issue includes the number of interactive and batch devices to be serviced by the DI, the Terminal Interface Program (TIP) used to service the device, and the number and type of network trunks serviced by the DI.

NOTE

The configuration limits expressed in this section assume that all devices are in active use. Some sites (e.g., office environments) may rarely have half of the devices in use at the same time. For those sites, the configuration limits may be increased, for example by 50%, but at the risk of overloading a DI during peak use. Sites that involve constant terminal use (e.g., ticket offices) should not exceed these limits.

For release 1.2 CDCNET, the supported types of devices and trunks include:

- . Asynchronous interactive terminals
- . BSC 3270 interactive terminals connected via Binary Synchronous Communications lines
- . BSC 3270 printers
- . Asynchronous interactive printers supported by NOS Printer Support Utility (PSU)
- . Asynchronous batch printers supported by NOS/VE batch services
- . HASP workstations and their attached devices
- . Unit Record Interface (URI) printers supported by NOS/VE batch services
- . ETHERNET trunks
- . X.25 trunks
- . HDLC trunks
- . Channel trunks to host (NOS or NOS/VE)
- . Network Job Entry Facility (NJEF) communications lines
- . Asynchronous communications lines for interactive passthrough ports

The second issue is the number of interactive, interactive passthrough, batch and/or application connections that can be simultaneously used through a DI. Generally, more memory is used as the number of active connections increases.

The number of active connections that can be established varies by device. Each interactive terminal is capable of establishing up to 16 simultaneous interactive connections (release default is 4) to either host interactive services or to passthrough ports. Although the maximum number of connections per terminal is configurable, it is felt that four connections is sufficient for most users. The examples in this section are therefore based on a practical limit of four active connections per user. Each batch device may have one batch or, for a NOS asynchronous printer, one interactive connection. Each passthrough port may have one connection. CDCNET applies no limits to the number of application to application connections that may be established. Typically, the number of simultaneous application to application connections through any DI system is small (less than four).

Supported Configurations

Only certain combinations of these devices and trunks are supported and are reviewed by this memo. The combinations determine a DI's type as follows:

NOS MDI	Up to two channel trunks to NOS hosts, up to three ETHERNET trunks to network.
NOS/VE MDI	Up to two channel trunks to NOS/VE hosts, up to three ETHERNET trunks to network.
TDI	Up to three ETHERNET trunks to network, up to 32 communications lines to asynchronous, HASP, BSC 3270 or URI devices or passthrough ports serviced by from one to three CIM boards. Asynchronous and/or URI printers are supported via NOS/VE batch services.
NOS MTI	Up to two channel trunks to NOS hosts; up to 32 communications lines to asynchronous, HASP or BSC 3270 serviced by from one to three CIM boards; or passthrough ports. Asynchronous printers are supported by PSU services only.
NOS/VE MTI	Up to two channel trunks to NOS/VE hosts; up to 32 communications lines to asynchronous, HASP or URI devices serviced by from one to three CIM boards; or passthrough ports.
RTI	Up to four HDLC trunks to network, up to 31 communications lines to asynchronous, HASP, BSC 3270 or URI devices serviced by from one to three CIM boards.
X.25 PAD NDI	Up to three ETHERNET trunks to network. Up to 16 X.25 trunks for X.25 PAD service (called X.25 AsyncTip) or for non-CDCNET connections (called X.25 Gateway).
X.25 PAD/NS NDI	Up to three ETHERNET trunks to network. Up to 16 X.25 trunks for X.25 PAD service, X.25 Gateway service or X.25 network connections (called X.25 network solution). This configuration may also include one or more HDLC trunks for network connections, though the total number of X.25 and HDLC trunks cannot exceed 16.
ESCI NDI	Up to three ETHERNET trunks used to interconnect the network.
HDLC NDI	Up to three ETHERNET trunks and up to 16 HDLC trunks used to interconnect the network.
X.25 NDI	Up to three ETHERNET trunks to network. Up to 16 X.25 trunks for additional CDCNET network connections.

Types of Memory

For DI systems, configurable memory is divided into two types: System Main Memory (SMM) and Private Main Memory (PMM). These types have different installation limits. SMM memory can be installed in multiples of 1 megabyte (i.e., 1MB, 2MB,..) as each SMM board contains 1MB. Only 1MB and 2MB of SMM are of interest for release 1.2 CDCNET DIs, as 2MB of SMM is sufficient to support any configuration that can be reasonably supported by a DI's processing power. Only one PMM board can be installed. PMM, however, can be accessed by the system faster than SMM memory and, thus, can increase the processing power of the DI by 10% to 40% depending on the DI's configuration. It is recommended that DI configurations supporting three of the communications line protocols (i.e., asynchronous, HASP, URI or BSC 3270) include PMM.

A DI uses the configurable memory left after software is loaded for two main purposes: one, for device configuration and connection management and two, for the buffering of data on connections. About equal amounts of memory are reserved for each purpose. For DI configurations that directly support terminal devices (i.e., TDI, NOS MTI, NOS/VE MTI, RTI and X.25 PAD NDI), the memory required for device configuration and connection management usually determines the limits of configuration. For DIs that do not directly support terminal devices, the memory required for the buffering of data usually determines the limits of configuration.

Typically, less than 5K of data is buffered in a DI for each terminal device that the DI supports. The configuration limits expressed in the following sections assume that, on average, no more than 5K of data is buffered per device. With normal terminal use, this allowance for data buffering is more than adequate as usually the data for a device is forwarded rapidly by the DI.

More than 5K of data could be buffered for an interactive terminal under unusual conditions. If the terminal user establishes multiple interactive connections and has the DI hold output for all but the connection currently in use, more than 5K of output data could be buffered for the terminal. A number of fairly large messages (e.g., 6 messages each greater than 300 bytes) would have to be held on connections established by more than one terminal user to exceed the 5K average per terminal. However, output is held for a connection until the connection is selected as the connection in use. Each output message can be up to 2K bytes in length with NOS/VE hosts or 1K with NOS hosts. Although such use of interactive connections should be rare, a site which plans to heavily utilize multiple connections per terminal should monitor the memory and buffer usage of the DIs to determine if additional memory is required.

The combinations of memory to be considered are:

- . 1 MB SMM
- . 1 MB SMM with PMM
- . 2 MB SMM
- . 2 MB SMM with PMM

Requirements by DI Type

This section breaks down DI memory requirements by general DI type and by specific classes within each type.

TDI

This discussion divides TDI configurations into five classes as follows. These classes represent the typical uses of TDIs.

1. TDIs with interactive terminals only
2. TDIs with interactive terminals and asynchronous printers
3. TDIs with interactive terminals and HASP, BSC 3270 or URI batch devices
4. TDIs with Interactive passthrough ports
5. TDIs with Interactive passthrough ports and URI printers

TDI with Interactive Terminals only

These TDIs include those configured with asynchronous interactive terminals, those configured with BSC 3270 terminals and those configured with PSU supported asynchronous printers.

A TDI with only interactive terminals has 185K for device configuration and connection management if 1MB of SMM is installed or 250K if 1MB of SMM with PMM is installed. For these TDIs, each asynchronous terminal, BSC 3270 terminal or PSU printer takes about 4K to configure and activate. Each active interactive connection for a terminal or PSU printer will take an additional 1K bytes to manage. Thus, if one connection is allowed per terminal, each terminal takes 5K, if two connections are allowed per terminal, each terminal takes 6K, etc. A TDI with 1MB SMM has the memory to support 37 terminals with one connection each, 30 terminals with two connections each, 26 terminals with three connections each or 23 terminals with four connections each.

The following chart illustrates the number of terminals verses connections for TDIs. Note that at most 32 asynchronous terminals or PSU printers can be connected to a TDI, therefore configurations with more than 32 terminals would include one or more BSC 3270 Information Display Systems and terminals.

TDI

INTERACTIVE TERMINALS SUPPORTED NO BATCH DEVICES				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Term	37	50	70	80
2 per Term	30	41	70	80
3 per Term	26	35	70	80
4 per Term	23	31	70	80

* Limited by processing power. Figures are rounded to nearest 5.

TDI with Asynchronous Batch Printers

A TDI with interactive terminals and asynchronous batch printers for NOS/VE has 150K for device configuration and connection management if 1MB of SMM is installed or 215K if 1MB of SMM with PMM is installed. As above, each terminal or printer takes about 4K to configure. Each active batch or interactive connection takes an additional 1K bytes to manage. A batch printer requires only one connection, therefore, the amount of memory on a TDI with 1MB SMM that is available for interactive terminals is 150K minus 5K times the number of asynchronous batch printers.

The following charts illustrate the number of terminals and connections allowed for one batch printer and two batch printer configurations.

TDI

INTERACTIVE TERMINALS SUPPORTED ONE ASYNC BATCH PRINTER					INTERACTIVE TERMINALS SUPPORTED TWO ASYNC BATCH PRINTERS				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM	MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Term	29	42	70	80	1 per Term	28	41	65	75
2 per Term	24	35	70	80	2 per Term	23	34	65	75
3 per Term	20	30	70	80	3 per Term	20	29	65	75
4 per Term	18	26	70	80	4 per Term	17	25	65	75

* Limited by processing power. Figures are rounded to nearest 5.

TDI with HASP, BSC 3270 or URI Batch Devices

A TDI with HASP, BSC 3270 or URI devices has 120K for device configuration and connection management if 1MB of SMM is installed or 185K if 1MB of SMM with PMM is installed. Again, each terminal or batch device takes about 4K to configure. Each active batch or interactive connection takes an additional 1K bytes to manage. A HASP, BSC 3270 or URI batch device requires only one connection, therefore, the amount of memory on a TDI with 1MB SMM that is available for interactive terminals is 120K minus 5K times the number of batch devices.

The following charts illustrate the number of terminals and connections allowed for one, two and four batch device configurations. Batch devices are assumed to be running at 70% of capacity or about 1500 characters/second per device. Note that the minimum HASP workstation consists of an interactive and a batch device, therefore one interactive terminal must be reserved for each HASP workstation. URI printers may be supported by NOS/VE batch services.

TDI

INTERACTIVE TERMINALS SUPPORTED ONE BATCH DEVICE					INTERACTIVE TERMINALS SUPPORTED TWO BATCH DEVICES				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM	MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Term	23	36	65	70	1 per Term	22	35	60	65
2 per Term	19	30	65	70	2 per Term	18	29	60	65
3 per Term	16	25	65	70	3 per Term	15	25	60	65
4 per Term	14	22	65	70	4 per Term	13	21	60	65

INTERACTIVE TERMINALS SUPPORTED FOUR BATCH DEVICES				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Term	20	33	45	50
2 per Term	16	27	45	50
3 per Term	14	23	45	50
4 per Term	12	20	45	50

* Limited by processing power. Figures are rounded to nearest 5.

TDI with Passthrough Ports

A TDI with passthrough ports has 175K for device configuration and connection management if 1MB of SMM is installed or 240K if 1MB of SMM with PMM is installed. It is assumed that the TDI includes the Interactive Passthrough Gateway. For these DIs, each passthrough port takes about 4K to configure and activate. Each passthrough connection takes an additional 3K, but each port may support only one connection.

The following chart illustrates the number of passthrough ports and interactive terminals supported for each memory configuration of a TDI. The chart assumes that each terminal is allowed three active connections and is equivalent to one passthrough port. Note that, at most, 32 passthrough ports can be connected to a DI.

TDI

PASSTHROUGH PORTS AND TERMINALS NO BATCH DEVICES				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Port or 3 per Term	25	34	40	50

* Limited by processing power. Figures are rounded to nearest 5.

TDI with Passthrough and Batch Printers

A TDI with passthrough ports and URI devices has 110K for device configuration and connection management if 1MB of SMM is installed or 175K if 1MB of SMM with PMM is installed. Again, each passthrough port or batch device takes about 4K to configure. Each active batch connection takes an additional 1K bytes to manage and each passthrough connection takes an additional 3K bytes.

The following charts illustrate the number of passthrough ports and interactive terminals supported for one, two and four batch device configurations. The chart assumes that each terminal is allowed 3 active connections and is equivalent to one passthrough port. Note that, at most, 32 passthrough ports can be connected to a TDI. Batch devices are assumed to be running at 70% of capacity or about 1500 characters/second per device.

TDI

PASSTHROUGH PORTS AND TERMINALS ONE BATCH DEVICE					PASSTHROUGH PORTS AND TERMINALS TWO BATCH DEVICES				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM	MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Port or 3 per Term	15	24	40	45	1 per Term or 3 per Term	14	23	35	40

PASSTHROUGH PORTS AND TERMINALS FOUR BATCH DEVICES				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Port or 3 per Term	12	22	25	30

* Limited by processing power. Figures are rounded to nearest 5.

NOS/VE MTI

NOS/VE MTIs are similar in configuration to TDIs, though the processing required for a NOS/VE MTI is somewhat greater and memory available for configuration is somewhat less. The memory required per device or per connection is the same for a NOS/VE MTI as for a TDI.

NOS/VE MTIs can be divided into the following classes by configuration. These configurations represent typical configurations for a NOS/VE MTI:

1. MTIs with interactive terminals only
2. MTIs with interactive terminals and asynchronous printers
3. MTIs with interactive terminals and HASP or URI printers

NOS/VE MTI With Interactive Terminals only

A NOS/VE MTI with only interactive terminals has 175K for device configuration and connection management if 1MB of SMM is installed or 240K if 1MB of SMM with PMM is installed.

The following chart illustrates the number of terminals verses connections for NOS/VE MTIs. Note that, at most, 32 asynchronous terminals can be connected to a NOS/VE MTI.

NOS/VE MTI

INTERACTIVE TERMINALS SUPPORTED NO BATCH DEVICES				
MEMORY CONNECTION	1MB	1MB PMM	2MB	2MB PMM
1 per Term	32	32	32	32
2 per Term	29	32	32	32
3 per Term	25	32	32	32
4 per Term	21	30	32	32

NOS/VE MTI

INTERACTIVE TERMINALS SUPPORTED NO BATCH DEVICES				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Term	35	48	60	70
2 per Term	29	40	60	70
3 per Term	25	34	60	70
4 per Term	21	30	60	70

* Limited by processing power. Figures are rounded to nearest 5.

NOS/VE MTI With Asynchronous Batch Printers

A NOS/VE MTI with interactive terminals and asynchronous batch printers for NOS/VE has 140K for device configuration and connection management if 1MB of SMM is installed or 205K if 1MB of SMM with PMM is installed.

The following charts illustrate the number of terminals and connections allowed for one batch printer and two batch printer configurations. As above, only 32 asynchronous terminals can be connected to a NOS/VE MTI.

NOS/VE MTI

INTERACTIVE TERMINALS SUPPORTED ONE ASYNC BATCH PRINTER					INTERACTIVE TERMINALS SUPPORTED TWO ASYNC BATCH PRINTERS				
MEMORY CONNECTION	1MB	1MB PMM	2MB	2MB PMM	MEMORY CONNECTION	1MB	1MB PMM	2MB	2MB PMM
1 per Term	27	32	32	32	1 per Term	26	32	32	32
2 per Term	22	32	32	32	2 per Term	21	32	32	32
3 per Term	19	28	32	32	3 per Term	18	27	32	32
4 per Term	16	25	32	32	4 per Term	16	24	32	32

NOS/VE MTI

INTERACTIVE TERMINALS SUPPORTED ONE ASYNC BATCH PRINTER					INTERACTIVE TERMINALS SUPPORTED TWO ASYNC BATCH PRINTERS				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM	MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Term	27	40	60	70	1 per Term	26	39	55	65
2 per Term	22	33	60	70	2 per Term	21	32	55	65
3 per Term	19	28	60	70	3 per Term	18	27	55	65
4 per Term	16	25	60	70	4 per Term	16	24	55	65

* Limited by processing power. Figures are rounded to nearest 5.

NOS/VE MTI With HASP or URI Batch Printers

A NOS/VE MTI with HASP or URI devices has 110K for device configuration and connection management if 1MB of SMM is installed or 175K if 1MB of SMM with PMM is installed.

The following charts illustrate the number of terminals and connections allowed for one, two and four batch device configurations. Batch devices are assumed to be running at 70% of capacity or about 1500 characters/second per device. Note that the minimum HASP workstation consists of an interactive and a batch device, therefore one interactive terminal must be reserved for each HASP workstation. As above, only 32 asynchronous terminals can be connected to a NOS/VE MTI.

NOS/VE MTI

INTERACTIVE TERMINALS SUPPORTED ONE BATCH DEVICE					INTERACTIVE TERMINALS SUPPORTED TWO BATCH DEVICES				
MEMORY CONNECTION	1MB	1MB PMM	2MB	2MB PMM	MEMORY CONNECTION	1MB	1MB PMM	2MB	2MB PMM
1 per Term	21	32	32	32	1 per Term	20	32	32	32
2 per Term	17	28	32	32	2 per Term	16	27	32	32
3 per Term	15	24	32	32	3 per Term	14	23	32	32
4 per Term	13	21	32	32	4 per Term	12	20	32	32

INTERACTIVE TERMINALS SUPPORTED FOUR BATCH DEVICES				
MEMORY CONNECTION	1MB	1MB PMM	2MB	2MB PMM
1 per Term	18	31	32	32
2 per Term	15	25	32	32
3 per Term	12	22	32	32
4 per Term	11	19	32	32

NOS/VE MTI

INTERACTIVE TERMINALS SUPPORTED ONE BATCH DEVICE					INTERACTIVE TERMINALS SUPPORTED TWO BATCH DEVICES				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM	MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Term	21	34	50	60	1 per Term	20	33	45	55
2 per Term	17	28	50	60	2 per Term	16	27	45	55
3 per Term	15	24	50	60	3 per Term	14	23	45	55
4 per Term	13	21	50	60	4 per Term	12	20	45	55

INTERACTIVE TERMINALS SUPPORTED FOUR BATCH DEVICES				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Term	18	31	45	50
2 per Term	15	25	45	50
3 per Term	12	22	45	50
4 per Term	11	19	45	50

* Limited by processing power. Figures are rounded to nearest 5.

NOS MTI

NOS MTIs divide into two classes with respect to their configuration. Note that asynchronous printers are supported as interactive devices for these DIs.

1. MTIs with interactive terminals only
2. MTIs with interactive terminals and HASP, BSC 3270 or URI batch devices

Due to the greater processing requirements of a NOS MTI configuration, these DIs are always configured with PMM. The memory configurations of interest, then, are 1MB SMM with PMM and 2MB SMM with PMM.

NOS MTI With Interactive Terminals Only

A NOS MTI with 1MB SMM and PMM has 190K for device configuration and connection management. For these DIs, each asynchronous terminal or PSU printer takes about 4K to configure. Each active interactive connection for a terminal or printer will take an additional 3K bytes to manage. Thus, if one connection is allowed per terminal, each terminal takes 7K, if two connections are allowed per terminal, each terminal takes 10K, if three connections are allowed per terminal, each terminal takes 13K etc. A NOS MTI with 1MB SMM and PMM can support 27 terminals with one connection each, 19 terminals with two connections each, 14 terminals with three connections each. The following chart illustrates the number of terminals verses connections for NOS MTIs.

NOS MTI

INTERACTIVE TERMINALS SUPPORTED NO BATCH DEVICES				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Term		27		45
2 per Term	NOT SUP- PORTED	19	NOT SUP- PORTED	45
3 per Term		14		45
4 per Term		11		44

* Limited by processing power. Figures are rounded to nearest 5.

NOS MTI With HASP or BSC 3270

A NOS MTI with HASP or BSC 3270 devices and 1MB SMM and PMM has 140K for device configuration and connection management. Again, each terminal, HASP or BSC 3270 batch device takes 4K to configure. Each active batch or interactive connection takes an additional 3K bytes to manage. A HASP or BSC 3270 batch device requires only one connection, therefore, the amount of memory on a NOS MTI with 1MB SMM and PMM that is available for interactive terminals is 140K minus 7K times the number of batch devices.

The following charts illustrate the number of terminals and connections allowed for one, two and four batch device configurations. Note that the minimum HASP workstation consists of an interactive and a batch device, therefore one interactive terminal must be reserved for each HASP workstation.

NOS MTI

INTERACTIVE TERMINALS SUPPORTED ONE BATCH DEVICE					INTERACTIVE TERMINALS SUPPORTED TWO BATCH DEVICES				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM	MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Term		19		40	1 per Term		18		35
2 per Term	NOT SUP- PORTED	13	NOT SUP- PORTED	40	2 per Term	NOT SUP- PORTED	12	NOT SUP- PORTED	35
3 per Term		10		40	3 per Term		9		35
4 per Term		8		40	4 per Term		7		35

INTERACTIVE TERMINALS SUPPORTED FOUR BATCH DEVICES				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Term		16		30
2 per Term	NOT SUP- PORTED	11	NOT SUP- PORTED	30
3 per Term		8		30
4 per Term		7		30

* Limited by processing power. Figures are rounded to nearest 5.

RTI

RTIs are similar in configuration and memory available to TDIs. RTIs are similar to NOS/VE MTIs in the processing required for a configuration. The memory required per device or per connection is the same for a RTI as for a TDI or NOS/VE MTI.

RTIs can be divided into the same configuration classes as used for the NOS/VE MTIs:

1. RTIs with interactive terminals only
2. RTIs with interactive terminals and asynchronous printers
3. RTIs with interactive terminals and HASP, BSC 3270 or URI batch devices

RTI With Interactive Terminals only

An RTI with only interactive terminals has 180K for device configuration and connection management if 1MB of SMM is installed or 245K if 1MB of SMM with PMM is installed.

The following chart illustrates the number of terminals verses connections for RTIs. One 56Kb HDLC trunk is necessary for configurations up to 40 interactive terminals. HDLC trunks with lower trunk speeds will support proportionately fewer terminals per trunk. Two 56Kb HDLC links are necessary for configurations with more that 40 terminals.

RTI

INTERACTIVE TERMINALS SUPPORTED NO BATCH DEVICES				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Term	36	46	55	70
2 per Term	30	40	55	70
3 per Term	25	35	55	70
4 per Term	22	30	55	70

* Limited by processing power. Figures are rounded to nearest 5.

RTI With Asynchronous Batch Printers

An RTI with interactive terminals and asynchronous batch printers for NOS/VE has 145K for device configuration and connection management if 1MB of SMM is installed or 210K if 1MB of SMM with PMM is installed.

The following charts illustrate the number of terminals and connections allowed for one batch printer and two batch printer configurations. One 56Kb HDLC link is necessary for configurations up to 40 interactive terminals. Two 56Kb HDLC links are necessary for configurations with more than 40 terminals.

RTI

INTERACTIVE TERMINALS SUPPORTED ONE ASYNC BATCH PRINTER					INTERACTIVE TERMINALS SUPPORTED TWO ASYNC BATCH PRINTERS				
MEMORY	1MB	1MB PMM	2MB*	2MB* PMM	MEMORY	1MB	1MB PMM	2MB*	2MB* PMM
CONNECTION					CONNECTION				
1 per Term	29	38	55	70	1 per Term	27	37	50	65
2 per Term	24	34	55	70	2 per Term	22	33	50	65
3 per Term	20	29	55	70	3 per Term	19	28	50	65
4 per Term	18	25	55	70	4 per Term	16	25	50	65

* Limited by processing power. Figures are rounded to nearest 5.

RTI With HASP, BSC 3270 or URI Batch Devices

An RTI with HASP, BSC 3270 or URI devices has 105K for device configuration and connection management if 1MB of SMM is installed or 170K if 1MB of SMM with PMM is installed.

The following charts illustrate the number of terminals and connections allowed for one, two and four batch device configurations. Batch devices are assumed to be running at 70% of capacity or about 1500 characters/second per device. A additional HDLC link is added necessary to handle the batch traffic. Note that the minimum HASP workstation consists of an interactive and a batch device, therefore one interactive terminal must be reserved for each HASP workstation.

RTI

INTERACTIVE TERMINALS SUPPORTED ONE BATCH DEVICE					INTERACTIVE TERMINALS SUPPORTED TWO BATCH DEVICES				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM	MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Term	20	33	50	60	1 per Term	19	32	45	55
2 per Term	16	27	50	60	2 per Term	15	26	45	55
3 per Term	14	23	50	60	3 per Term	13	22	45	55
4 per Term	12	20	50	60	4 per Term	11	20	45	55

INTERACTIVE TERMINALS SUPPORTED FOUR BATCH DEVICES				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Term	17	30	40	50
2 per Term	14	25	40	50
3 per Term	12	21	40	50
4 per Term	10	18	40	50

* Limited by processing power. Figures are rounded to nearest 5.

X.25 PAD NDI

X.25 PAD NDIs can be divided into the following configuration classes:

1. X.25 PAD NDIs with interactive terminals only
2. X.25 PAD/NS NDIs with interactive terminals and an X.25 or HDLC network solution
3. X.25 PAD NDIs with interactive terminals and X.25 Gateways to foreign hosts

X.25 PAD NDI With Interactive Terminals only

An X.25 PAD NDI for interactive terminals only includes the X.25 Async. TIP and the software to support X.25 communications. This NDI has 165K for device configuration and connection management if 1MB of SMM is installed or 230K if 1MB of SMM with PMM is installed. Each X.25 trunk requires 18K bytes to configure and activate. Each interactive terminal requires one X.25 virtual circuit that requires 2K bytes to manage. Finally, each CDCNET connection established by the terminal user required 1K bytes to manage.

The following charts illustrate the number of interactive terminals supported for one and two X.25 trunk configurations. Note that the charts assume X.25 trunk speeds of 56Kb so that each trunk can support 40 virtual circuits.

X.25 PAD NDI

INTERACTIVE TERMINALS SUPPORTED ONE X.25 TRUNK					INTERACTIVE TERMINALS SUPPORTED TWO X.25 TRUNKS				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM	MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Term	40	40	40	40	1 per Term	43	55	45	55
2 per Term	36	40	40	40	2 per Term	32	48	45	55
3 per Term	29	40	40	40	3 per Term	25	38	45	55
4 per Term	24	35	40	40	4 per Term	21	32	45	55

* Limited by processing power. Figures are rounded to nearest 5.

X.25 PAD/NS NDI With Interactive Terminals

An X.25/NS PAD NDI includes the X.25 Async. TIP and an X.25 (or HDLC) network solution to interconnect CDCNET networks. This NDI has 160K for device configuration and connection management if 1MB of SMM is installed or 225K if 1MB of SMM with PMM is installed. Each X.25/HDLC trunk requires 18K bytes to configure and activate. Each interactive terminal requires one X.25 virtual circuit that requires 2K bytes to manage. Finally, each CDCNET connection established by the X.25 PAD terminal user required 1K bytes to manage.

The following charts illustrate the number of interactive terminals supported for two and three X.25/HDLC trunk configurations (one trunk is used as the X.25/HDLC network solution). Note that the charts assume X.25/HDLC trunk speeds of 56Kb so that each trunk can support 40 virtual circuits or CDCNET connections. The X.25 or HDLC network solution is assumed to require 40% of the NDIs processing power for 40 active CDCNET connections through the network solution.

X.25 PAD/NS NDI

INTERACTIVE TERMINALS SUPPORTED TWO X.25 TRUNKS					INTERACTIVE TERMINALS SUPPORTED THREE X.25 TRUNKS				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM	MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Term	30	35	30	35	1 per Term	30	35	30	35
2 per Term	30	35	30	35	2 per Term	26	35	30	35
3 per Term	24	35	30	35	3 per Term	21	34	30	35
4 per Term	20	31	30	35	4 per Term	17	28	30	35

* Limited by processing power. Figures are rounded to nearest 5.

X.25 PAD NDI With Interactive Terminals And X.25 Gateways

An X.25 PAD NDI for interactive terminals and X.25 Gateways includes the X.25 Async. TIP, X.25 Gateway and the software to support X.25 communications. This NDI has 155K for device configuration and connection management if 1MB of SMM is installed or 220K if 1MB of SMM with PMM is installed. Again, each X.25 trunk requires 18K bytes to configure and activate and each interactive terminal requires 2K bytes for an X.25 virtual circuit and 1K per CDCNET connection. Each X.25 Gateway definition requires 5K bytes with up to four gateway outcall titles added per definition. Each A - A connection through an X.25 Gateway requires 2K bytes to manage.

The following charts illustrate the number of interactive terminals that can be supported with one or two X.25 trunks and one X.25 Gateway per trunk. The charts assume that no more than two simultaneous A - A connections are active through each X.25 Gateway. The A - A traffic is limited by the higher priority given to interactive traffic to sending about one 1500 byte message per second each way on each trunk. The charts assume X.25 trunk speeds of 56Kb; however, the simultaneous A - A traffic limits the number of interactive virtual circuits per trunk to 30.

X.25 PAD NDI

INTERACTIVE TERMINALS SUPPORTED ONE X.25 GATEWAY					INTERACTIVE TERMINALS SUPPORTED TWO X.25 GATEWAYS				
MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM	MEMORY CONNECTION	1MB	1MB PMM	2MB*	2MB* PMM
1 per Term	30	30	30	30	1 per Term	33	55	45	55
2 per Term	30	30	30	30	2 per Term	25	41	45	55
3 per Term	25	30	30	30	3 per Term	20	33	45	55
4 per Term	21	30	30	30	4 per Term	16	27	45	55

* Limited by processing power. Figures are rounded to nearest 5.

NOS MDI

As NOS MDIs are not directly connected to interactive or batch devices, the configuration limits for these DIs are established by the requirements for buffering the data on connections. Due to the greater processing required for a NOS MDI configuration, these DIs are always configured with PMM. A NOS MDI with 1MB SMM and PMM has 250K for servicing connections and each connection requires about 5K to service. Each NOS host channel takes about 35K for management and for definition of the interactive, batch and application gateways to the host. Therefore, about 43 active connections can be supported by a NOS MDI with 1MB SMM and PMM with one host channel. About 36 connections can be supported with two host channels. A NOS MDI with 2MB SMM and PMM is limited by processing power rather than memory to about 140 active connections.

NOS/VE MDI

A NOS/VE MDI also has no directly connected devices. A NOS/VE MDI with 1MB SMM has sufficient memory to support the configurations committed for release 1.2. A NOS/VE MDI without PMM can support the network traffic for about 220 active connections. A NOS/VE MDI with PMM can support the traffic for about 290 active connections.

ETHERNET to ETHERNET NDI

An ETHERNET to ETHERNET NDI with 1MB SMM (no PMM) has sufficient memory to support up to three ETHERNET trunks, the maximum configuration committed for release 1.2. An ETHERNET to ETHERNET NDI without PMM can support the network traffic for about 350 active connections. An ETHERNET to ETHERNET NDI with PMM can support the network traffic for about 440 active connections.

ETHERNET to HDLC NDI

For ETHERNET to HDLC NDIs, the configuration limits are determined by the storage required for the buffering of network traffic in transmission queues. For HDLC trunks, the transmission queues are 30K bytes. An ETHERNET to HDLC NDI with 1MB SMM has about 225K for the buffering of network traffic for the HDLC trunks. An ETHERNET to HDLC NDI with 1MB SMM then can support 7 HDLC trunks. An ETHERNET to HDLC NDI with 1MB SMM and PMM can support 9 HDLC trunks. An ETHERNET to HDLC NDI with 2MB SMM can support 16 HDLC trunks, the maximum configuration committed for release 1.2.

An ETHERNET to HDLC NDI without PMM has the processing power to support the network traffic for about 140 active connections or 3 56Kb HDLC trunks. An ETHERNET to HDLC NDI with PMM can support the traffic for about 170 active connections or 4 HDLC trunks. The maximum character transmission rate is limited, however, to 65K characters/second for configurations with or without PMM.

ETHERNET to X.25 NDI

For ETHERNET to X.25 NDIs, the configuration limits are also determined by the storage required for buffering of the network traffic in transmission queues. For X.25 trunks, the transmission queues are 30K bytes. An ETHERNET to X.25 NDI with 1MB SMM has about 215K for the buffering of network traffic for the X.25 trunks. An ETHERNET to X.25 NDI with 1MB SMM then can support 7 X.25 trunks. An ETHERNET to X.25 NDI with 1MB SMM and PMM can support 9 X.25 trunks. An ETHERNET to X.25 NDI with 2MB SMM can support 16 HDLC trunks, the maximum configuration committed for release 1.2.

An ETHERNET to X.25 NDI without PMM has the processing power to support the network traffic for about 100 active connections or 2 56Kb X.25 trunks. An ETHERNET to X.25 NDI with PMM can support the traffic for about 130 active connections or 3 56Kb X.25 trunks. The maximum character transmission rate is limited, however, to 65K characters/second for configurations with or without PMM.

Trunk Requirements

The following table contains the memory costs of additional network trunks to DIs. The table includes how many interactive terminals should be deducted from a configuration for each additional trunk.

TRUNK	COST:	
	Memory	Number of Terminals
Ethernet	8K	1
HDLC	12K	2
X.25	18K	3
NOS/VE Channel	12K	2
NOS Channel	35K	6

NOTE

An additional Ethernet requires 8K of memory for management of the network and about 45K (300 data buffers) for the buffering of messages received from the Ethernet network. Each terminal requires about 5K for buffering data (35 data buffers). If the number of data buffers in a DI is just sufficient to satisfy the number of terminals configured, the addition of another Ethernet network deducts 9 terminals from the configuration. If the number of buffers is 300 greater than the number required to satisfy the terminals configured, the addition of an Ethernet reduces the number of terminals supported by 1.

CIM Limitations

For release 1.2 CDCNET, CIM boards have the following configuration limits:

- . A minimum of one CIM board is needed for each communication protocol used for communications to interactive terminals or batch devices. For example, asynchronous protocol alone requires one CIM board, asynchronous protocol plus HASP protocol requires 2 CIM boards. The addition of an HDLC or X.25 trunk, however, may not require an additional CIM board.
- . Each CIM board can support 2 56 Kb HDLC or X.25 trunks.
- . Each CIM board can support 32 asynchronous lines or passthrough ports, the maximum that can be installed per DI for release 1.2.

. Each CIM board can support 64 BSC 3270 terminals.

Application/Terminal User Information

The following items describe application/terminal user information for CDCNET:

- Host Unavailability Processing
- Emergency Escape Sequence for CDC 721 Terminals
- Passthrough Users Must Enter Double Break Sequence
- Downline Attribute Changes Affect Passthrough Configuration
- Using XMODEM and Passthrough
- Use of BSC 3270 TIP with BSC 3270 Emulation Packages
- BSC 3270 User Connection Termination Requirement
- Time Out of Multiple Interactive Connections

Host Unavailability Processing

Under certain conditions, it will take CDCNET software a relatively long time (minutes) to inform its users (connected to CDCNET via interactive terminals) about the loss of their connections to CYBER (NOS or NOS/VE) host applications, the inability to create new connections to CYBER applications, and the inability to execute terminal user procedures via the CDCNET do command.

Emergency Escape Sequence for CDC 721 Terminals

The CDCNET emergency escape sequences (break key followed by control-A then control-T or the break key followed by control-A then control-X) do not work on CDC 721 terminals with echoplexing turned on. The CDC 721 interprets the control-A (SOH) character as an internal command. Users may now enter a break followed by control-X for the emergency escape sequence. This will work on the CDC 721 terminal. There is no alternative for the break followed by control-A then control-T sequence.

Passthrough Users Must Enter Double Break Sequence

Passthrough users are required to hit the break key twice in order to send a single break out their connected passthrough ports. The double break feature of passthrough allows the terminal user to enter break sequences to the local DI without causing the unwanted side affect of interrupting or terminating their connected applications. Take care not to enter the double break key sequence too rapidly or it may be mistaken as only one.

Downline Attribute Changes Affect Passthrough Configuration

In a non-passthrough configuration, commands such as TRMDEF can be used to set parity, XON/XOFF flow control, and other parameters for the communication line that connects the terminal to the CDCNET. If such commands are used in a passthrough environment, they will affect the parameters of the remote system port connected to the passthrough communication line, not the terminal's parameters. Users that issue commands to remote systems to change async terminal attributes may inadvertently change the configuration of the remote system port connected to the passthrough port. Changing parity and flow control in this manner usually results in communications problems for the passthrough port. When debugging passthrough communication problems, the possibility of such commands embedded in user startup procedures on the remote system should be investigated. For a limited number of cases, user initiated downline attribute changes for the remote system port may be appropriate in a passthrough configuration. But before doing so, the ramifications of using such commands in a passthrough environment should be completely understood.

Using XMODEM and Passthrough

Before creating the passthrough connection which is to be used for XMODEM transfers, the micro user must ensure that parity and character flow control are disabled. If a NOS/VE XMODEM file transfer is to occur at speeds less than 9600 bps, the micro user must also set the transparent message length connection attribute to 135. The sequence to make and properly configure a connection for XMODEM use is as follows:

```
change_terminal_attributes (chata) parity=none ..  
character_flow_control=no
```

```
create_connection (crec) passthrough_service
```

The following command is required for XMODEM on NOS/VE systems for file transfers below 9600 bps.

```
<Break><CTRL-X><ncc>change_connection_attributes (chaca) ..  
transparent_message_length=135 input_editing_mode=transparent
```

Follow the input of each line above with a carriage return.

Use of BSC 3270 TIP with BSC 3270 Emulation Packages

BSC 3270 users could experience an intermittent loss of logical connection with a 327X controller. The cause of this situation is currently unknown and is being investigated. This situation has been encountered only on Zenith (TM) PCs running the Zenith BSC 3270 emulation package consisting of the Zenith P0-5063-1 3270 emulator software. The indication to the user is that CDCNET has stopped communicating to a console on the 327X. If the network operator displays the line status it indicates the line is active, but the console device is down. Operator intervention at the 327X workstation is

required such that CDCNET changes the console device status from down to active. This is accomplished by the 327X user keying in anything at that console. This results in the user being given the "You may enter CDCNET commands" prompt.

BSC 3270 User Connection Termination Requirement

If no output is pending for a terminal, the BSC 3270 TIP is unable to detect that the BSC 3270 terminal has been powered down by the terminal user. If the terminal user has an active CDCNET connection to a NOS host when the terminal is powered down, the TIP will not clear the CDCNET connection until the NOS host clears the connection or sends output to the terminal. If a new terminal user powers up the terminal before the connection is cleared, the NOS session for the previous user of the terminal will resume. The new user could then have unrestricted access to the service privileges and files of the previous user.

Sites should instruct BSC 3270 terminal users to always logoff all host sessions. NOS hosts should also be configured to timeout connections for no activity.

Time Out of Multiple Interactive Connections

CDCNET allows multiple connections per terminal with a released default of four connections per terminal. In general, a terminal which operates in a multiple connection environment requires more network resources than a terminal which does not. In particular, a terminal which maintains its non-working connections with an output_action of HOLD, causes additional buffers to be used for holding output. Even if the connection is deleted by the host, the output is held until the connection is selected as the working connection. Although there is a limit on the amount of output that may be held, maintaining multiple connections in the state of holding output has the potential to degrade or deny service on active working connections. Site administrators should instruct all users using multiple connections on switched lines to either hang-up at the end of their sessions or ensure that all connections have been disconnected before leaving their terminals. As a preventative measure, Sites may elect to limit the number of connections on switched lines to one.

Communication Equipment Information

This section contains information about various communication equipments and hardware related issues associated with CDCNET networks. The following items are contained in this section:

- Terminal Parity Setting Relative to Flow Control
- ROM Pack Allows High Speed Use of CDC 721 Terminals
- ROM Upgrade for Zenith Z150/Z160 Computers

- CIM ROM Required for V.35 LIM Support and RTI
- General Cable Connection Information
- Cable Requirements for EIA Flow Control

Terminal Parity Setting Relative to Flow Control

When the CDCNET terminal attribute Character Flow Control (CFC) is on, the XON and XOFF characters which may be sent to regulate upline data flow, will be generated based on the setting of the terminal attribute for parity. XON and XOFF characters sent by a terminal to regulate downline data may have the parity set to any value. CDCNET ignores the parity bit when checking input data for XON and XOFF characters, regardless of what the terminal attribute for parity is set to. Some terminals such as the 721 will ignore XON and XOFF characters sent by CDCNET to regulate upline data if they are not sent with correct parity. This problem can manifest itself as flow control not being invoked on upline data when it should be (XOFF ignored) or never getting out of flow control once it has been invoked (XON ignored). This problem is most likely to occur when a terminal is being operated in other than odd or even parity on a line where parity is set by auto-recognition. The solution to this problem is to ensure that if the terminal is being operated in no parity mode, the CDCNET terminal attribute is set the same way. If the terminal is operated so that its parity is generated as a mark or a space, experimentation may be necessary to determine what works correctly for flow control.

ROM Pack Allows High Speed Use of CDC 721 Terminals

CDC 721 terminals have problems with flow control at high line speeds. CDC recommends that CDC 721 terminals with Revision 3.0 firmware not be used above 9600 bps and that CDC 721 terminals with Revision 4.0 firmware not be used in 132 column mode at line speeds above 9600 bps. Some users may see problems on CDC 721 terminals with Revision 4.0 firmware in 80 column mode at line speeds above 9600 bps. These problems have been seen on both NOS and NOS/VE systems, but appear to occur more frequently on NOS/VE screen mode operations than on NOS screen mode operations. In non-screen mode, the problems will most likely appear with equal frequency on either system.

An optional ROM pack (CDC part number 721-302) is now available for CDC 721 terminals, which addresses the line speed problem. The ROM pack works in CDC 721 terminals which have the revision 4.0 firmware option installed, and simply plugs into the the back of a CDC 721 terminal. The ROM pack can be obtained by contacting a Control Data sales representative.

ROM Upgrade for Zenith Z150/Z160 Computers

Users of Async Emulation packages on Zenith(TM) Z150/Z160 computers may experience intermittent loss of character data being transferred to the PC when the floppy diskette is active. This is caused by a problem in the Zenith ROM and has been corrected by Zenith in later versions of the ROM. If you experience this problem contact your Zenith supplier for information on

obtaining these updated ROM levels. This problem has been observed using the following asynchronous protocol emulation packages:

- . CROSSTALK XVI 3.61
- . ASCII PRO
- . CONNECT 1.2

CIM ROM Required for V.35 LIM Support and RTI

FCO 17983 is documented in the CDCNET FCA charts as required for CDCNET 1.2 features V.35 LIM support and HDLC remote load (downline loading RTIs for example), which must have this FCO installed to be functional. This FCO enhances code in the ROMs on CIM boards. If you do not use the features defined above, CDCNET 1.2 will function correctly with the current CIMs, but it is recommended that you install this FCO in a timely manner. CDCNET releases 1.0 and 1.1 function correctly with the new CIM ROMs.

General Cable Connection Information

Control Data has tested various communications gear in CDCNET configurations. The CDC cable equipments and configurations, used in the CDCNET testing, are described here for general cabling information.

Equipment and product numbers (in parenthesis) are given for the cables. The designation "xx" in product numbers refers to the length of the cable in feet (10, 25, 50, etc.) Refer to the new CDC product manual (publication number 60460590) for Control Data hardware information. Other equipment cabling requirements may vary with manufacturers specifications; refer to the suppliers documentation for specific cabling requirements before configuring equipment in network applications.

The following cable configurations were used in CDCNET testing:

1. Cable connections for BSC 3270 TIP

The BSC 3270 configuration included a 3180 model 110 IBM (TM) display station and a 3287 model 2 IBM (TM) 129 cps printer. Cabling requirements may vary for equipment, other than those specifically identified here, used in 3270 configurations. Be sure to verify that the equipment connectors are compatible with CDC cables. Refer to the equipment manufacturers connector specifications and verify that the pin assignments match the Control Data equipment specification for the TN109 25 (2612-5xx) pin D type connector.

- A. From a BSC 3270 configured RS232 LIM port to a modem, TN108 (2612-1xx) was used.
- B. From a BSC 3270 configured RS232 LIM port to a 3274 model 51C IBM controller, TN109 (2612-5xx) was used.

2. Cable connections for CDCNET Async Passthrough

- A. From a CDCNET Async Passthrough configured RS232 LIM port to a HAYES (TM) compatible modem (MULTI TECH (TM) model 224) use TN108C.
- B. From a CDCNET Async Passthrough configured RS232 LIM port to any RS232C D type connector with EIA flow control, TN472 (2612-6xx) was used.
- C. From a CDCNET Async Passthrough configured RS232 LIM port to any RS232C D type connector where EIA flow control was not intended to be used TN109 (2612-5xx) was used. (Refer to the explanation of cable requirements for EIA flow control below.)
- D. From an Async Passthrough configured LIM to a second Async Passthrough LIM without EIA flow control, two cables were spliced by connecting the male and female 25 pin D type connectors together, in effect, forming one cable suitable for LIM to LIM connection. A TN108 (2612-1xx) cable was connected to either a TN472 (2612-6xx) or TN109 (2612-5xx) cable for this purpose.

Cable Requirements for EIA Flow Control

CDCNET supports EIA flow control (also referred to as "out of band" or control signal, flow control) for input data. EIA flow control can be specified in a configuration file by the following command:

```
define_line, (def1) eia_flow_control = on
```

For output, Clear To Send (CTS) flow control is always enabled. If CDCNET needs to regulate the flow of input to avoid data loss and EIA flow control has been specified for the device, CDCNET will drop the Request To Send (RTS) signal output from the LIM (which is also input to the connected device). This stops the flow of input data from directly connected devices that use this signal for flow control.

When EIA flow control is to be used for an async connection a TN472 (2612-6xx) or equivalent cable must be used. Using a TN109 (2612-5xx) cable with EIA flow control enabled results in stopped output, lost data, and line disconnects. Since TN472 type cables support both EIA flow control as well as character flow control, they offer the best null modem (directly connected DTE-to-DTE,) cable configuration for all asynchronous direct connections.

CDCNET Batch Devices

The following items describe CDCNET batch devices:

- Character Mapping on CYBER 18 HASP Workstations
- Unsupported HASP Directive

Character Mapping on CYBER 18 HASP Workstations

1. CYBER 18 HASP Workstation On the display terminal that provides the workstation operator with an interface to the CYBER 18 system, the underscore character is mapped to a backspace character. To change the mapping so that the character is interpreted as an underscore, do the following:

CARD DECK SYSTEM:

Insert the following patch card before the HASP initiation (HWS) card:

```
PAT,1108/1803
^
column 1
```

FLEXIBLE DISK SYSTEM:

Insert the following patch card before the HASP initiation (HWS) card using the procedure documented in the HASP RJE WORKSTATION CONTROLWARE INSTALLATION HANDBOOK (60475360) titled "Updating Configuration on Flexible Disk".

PAT,1108/1803

^

column 1

2. CYBER 120 HASP Workstation

For correct banner page formatting, the default forms control specifications contained in :UTIL:FORMS:HASP_STANDARD may need to be modified. To change to an alternate forms control, refer to the Software Release Bulletin for the 553/556 HASP Emulator (SMD170474) under the 'Notes and Cautions' section. The following are the forms control settings for a 66 line page with the "automatic skip on perforation" printer switch disabled:

FORM LENGTH IN LINES PER PAGE

[66]

TOP OF FORM (CHANNEL 1) LINE NUMBER

[1]

BOTTOM OF FORM (CHANNEL 12) LINE NUMBER

[66]

VFU TAPE (1-66 CHANNEL NUMBER 2-11, OR NL)

[5-2, 6-3, 7-4, 8-5, 9-6,10-7,11-8,12-9,13-10,14-11,]

3. Printer Option Settings

The HASP workstation line printer main control panel options should be selected as shown in Table 6-5 in the CDCNET Batch Device Users Guide (60463863) with the following exceptions:

Option Number	Setting
21	Y/N
22	5
28	N
33	96/19
34	8

Unsupported HASP Directive

CDCNET does not support the /*CONFIG directive to define the configuration of the devices on the workstation. Instead, the terminal operator enters the DO,<proc>,TDP command, where <proc> identifies the TDP containing the device configuration.

Manual Errata

Terminal Usage manual Change

The following information was omitted from the CDCNET Terminal Usage manual.

SETTING PAD PARAMETERS

The Set_Pad_Message (SETPM) command will enable Network Administrators to modify the CCITT and non-CCITT parameters of their PDN (or PAD concentrators). This command processor will convert the parameter numbers and values into an X.29 Set PAD Message and send it to the PAD. Parameter reference numbers and values will be restricted to the range of 0 to 127. If non-CCITT parameters are included, they must follow CCITT parameters when present, and the national marker must be included.

The SETPM command may only be executed from a Terminal User Procedure.

Set_Pad_Message value = list 1..63 of list 2 of <integer>

Value (V)

A list of each PAD reference number followed by the value.

SETPM Example:

SETPM,value=((3,2),(0,33),(63,0))

This command will cause a set PAD message to be sent to the PAD changing CCITT reference #3 (data forwarding signal) to a 2 (CR). Reference #0 is CCITT defined separator between Recommendation X.3 parameters and non-CCITT parameters. The 33 is the Data Network Identification Code (DNIC) for TELENET. TELENET reference #63 (eight bit transparent) will be set to 0 (enabled).

The X.25 AsyncTip will treat ANY CCITT X.3 reference number modified by the SETPM command as a non-mappable X.3 reference number. As a result, Network Administrators are cautioned to not use the SETPM command to set X.3 parameters that are mapped to VTP attributes, as results may be unpredictable."

Future Considerations

Future Change in the Size of Network ID

In a future release there will be a change in the range of values allowed for the "network id" used to identify a network solution.

The commands below include a parameter called "network_id" which is used to specify the network id of a given network solution. At present, the value of this parameter can range from 1 to 7FFFFFFF(16).

```
define_ether_net (defen)
define_channel_net (defcn)
define_hdlc_net (defhn)
define_x25_net (defxn)
```

In a future release of CDCNET, the range of values for the "network_id" parameter in the above commands will be changed to be from 1 to FFFF(16). This will be done to facilitate support of ISO OSI software.

This change will affect only those sites who are using values larger than FFFF(16) for the network id of one or more network solutions.

Future Procedure Libraries on CDCNET

In a future release, terminal user procedures, terminal definition procedures and DI configuration procedures will be combined on to their own respective libraries, similar to what is done on NOS/VE CDCNET systems. Several practices you can use now to ease migration to the new format are listed below:

- . Maintain all terminal user procedures, terminal definition procedures and DI configuration files on the same user name.
- . Include PROC and PROCEND statements in DI configuration files. The proper statements should follow the examples given below.

The first line of the file should read:

```
PROC SYSTEM_080025ssssss
```

The last line of the file should read:

```
PROCEND SYSTEM_080025ssssss
```

(ssssss are the last six digits of the system identifier.)

BSC 3270 Considerations

In a future release the following BSC 3270 TIP character sequences will change:

- . BSC 3270 Trusted Path Sequence

For CDCNET release 1.2, the trusted path sequence for the BSC 3270 TIP is the PA 1 key (Program Access 1) followed by the character sequence "AS" (upper or lower case) in the next input. This sequence will be changed, in a future CDCNET release, to PA 1 followed by the character sequence "AT" (upper or lower case). This change will bring the trusted path sequence for the BSC 3270 TIP in line with the sequence used by other TIPs.

- . BSC 3270 Terminate Transparent Sequence

For CDCNET release 1.2, the terminate transparent sequence for the BSC 3270 TIP is the PA 1 key (Program Access 1) followed by the character sequence "AT" (upper or lower case) in the next input. This sequence will be changed, in a future CDCNET release, to PA 1 followed by the character sequence "AX" (upper or lower case). This change will bring the terminate transparent sequence for BSC 3270 TIP in line with the sequence used by other TIPs.

- . Break Key Action for BSC 3270 TIP

The BSC 3270 TIP recognizes the PA 1 key (Program Access 1) as a break key. If the terminal attribute Break_Key_Action is set to zero for a 3270 terminal, the BSC 3270 TIP will terminate transparent input editing unconditionally when the PA 1 key is entered. This action will be changed, in a future CDCNET release, so that the terminate transparent sequence is required to terminate transparent input editing.

NOS 2.5.2 L678/670
Software Release Bulletin

Installation Response Form

Central Software Support maintains a list of the sites using NOS. In order that we may represent the customer base more effectively, we ask that you fill out this form and return it to Central Software Support. Thank you.

SITE NAME

SITE CODE

SITE ADDRESS

MAINFRAME MODELS

CONTACT

INSTALLATION DATE

This site has installed NOS 2.5.2 and is currently using it in a production environment.

Please return to:

Central Software Support - ARH213
Control Data Corporation
4201 North Lexington Avenue
St. Paul, Minnesota 55126-6198

