

NOS 2.5.1 LEVEL 670 SOFTWARE RELEASE BULLETIN

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

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SRB Introduction

This document is the NOS 2.5.1 L670 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 as indicated in the Configuration Management section of the Software Availability Bulletin (SAB).

The NOS 2.5.1 L670 system described in this document is being released at the Operating System level, Common Product Set level, Network Host Product, and CDCNET level of 670.

Audience

The SRB is written for the site analyst. It contains notes and cautions about installation and usage of NOS 2.5.1 L670.

Central Software Support Telephone Number Change

Effective September 27, 1986, calls for all Systems product support (i.e. NOS, NOS/VE, NOS/BE, RHF, VX/VE, C/VE, FORTRAN, COBOL, IM/DM, NJEF, FCON, etc.) should be made to Central Software Support's new numbers.

For all calls outside the USA, CANADA, and those from within Minnesota, the telephone number is:

612-851-4131

Within the continental USA, call toll free:

800-328-3980

Within CANADA, call toll free:

800-527-0564

Control Data employees can use Controlnet number:

334-4131

Your calls will be answered "WORLD SUPPORT CENTER", a customer service representative will ask a few preliminary questions, give the caller an incident number (to speed service, if additional phone contacts are necessary), and put the caller in contact with a Central Software Support analyst to handle the situation.

Central Software Support appreciates your cooperation during the transition and looks forward to providing you with improved service.

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SRB Introduction

NOS 2.5.1 L670 SRB (12/16/86)

Feature Notes Bulletin (FNB)

Feature Notes Bulletin (FNB)

The Feature Notes Bulletin for NOS 2.5.1 L670 is included as an appendix to this SRB.

Chapter 1

Installation

Notes and Cautions

This section highlights system and installation changes that may significantly affect the installation of NOS 2.5.1 L670.

Changes to Operating System Decks

The following deck is new at NOS 2.5.1 L670:

COMPSDA - Set (mass storage) device available.

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 There is an incompatibility between PASCAL, segmentation and CMM when interfaced with other products using common memory manager. Code to fix this problem is available under PSR ident PA10027.

SORT5 The wrong minimum buffer length causes SORT5 to hang. Code to fix this problem is available under PSR ident ST5A381.

FORTTRAN 5 Optimization for Model 990

The FTN5 compiler will now generate object code optimized for the model 990 CPU. This results in different code scheduling for the 990 caused by different relative speeds of the functional units as compared to other parallel processor models. In order for a 990 customer to take advantage of this optimization, the compiler must be rebuilt. This involves setting the MFT parameter for installation job TEXT equal to 990 and running the installation jobs TEXT, FCL5, PMD, CCG and FTN5 per the NOS Installation Handbook.

Support Change for Installation Verification Jobs

Support of the installation verification jobs in DECKOPL was dropped with the release of NOS 2.5.1 L664. Information concerning these jobs has been moved to appendix F of the IHB. The jobs can still be found on user name INSTALL, under the file name VJOBS in this release. This file, however, will not be available in future releases of NOS.

Installation Job Messages

Five installation jobs return non-fatal error messages. These conditions do not affect the generated binaries. The following table lists these errors along with their associated frequency for the products involved. The frequency of occurrence is relative to the products as released and any local code may change these frequencies.

PRODUCT	NON-FATAL UPDATE ERRORS	PARTITIONS NOT REPLACED IN COPYL	NON-FATAL LOADER ERRORS
BAM	1		
BASIC		2	
NIP5870			1
SORT5		1	
TEXT	2		

When building dual-state binaries from source, the command issued on the NOS/VE side:

```
CONVERT_DSSL_TO_TEXT $USER.DUAL_STATE_SOURCE_LIBRARY DUALpsrin
```

will produce two non-fatal warning messages. The warning messages are:

```
-- WARNING SC105-- Deck DSA$FAKE_OS_INTERFACE is not expandable  
-- WARNING SC105-- Deck DSA$FAKE_CM_INTERFACE is not expandable
```

PSR Summary Report

A summary report of all the NOS PSR modsets in NOS 2.5.1 L670 is available on the permanent file dump tape as file PFGPRPT. It is loaded to the installation user name INSTALL during the SYSGEN procedure call SYSGEN(SOURCE). The permanent file name is PSRRPT.

CPM IPRDECK Entry

Indices used to select CP multipliers via the CPM IPRDECK command have been changed to include support for new mainframes. This change may affect sites currently using the CPM IPRDECK command. Sites wishing to use this option in order to alter the default SRU calculation should consult the Analysis Handbook for correct CP selection values.

Upgrading CIP in a Dual-State Environment

If your system runs in a dual-state environment, there are NOS/VE and CIP dependencies when installing and upgrading to level 670 of CIP, NOS and NOS/VE. NOS/VE 1.2.1 L664 requires CIP V6 L664 and NOS/VE 1.2.1 L670 requires CIP V6 L670. Because of this, you must NOT upgrade to CIP L670 until you are ready to run NOS/VE 1.2.1 L670. You may run NOS 2.5.1 L670 with CIP V6 L664. To upgrade to NOS 2.5.1 L670 and leave NOS/VE at L664, you must use the back level dual-state binaries provided on the NOS 2.5.1 L670 permanent file tape and continue to run CIP V6 L664.

Dual State Support

NOS 2.5.1 L670 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 1.2.1 L670 are contained on the NOS deadstart tape for NOS Dual State customers. Binaries for NOS/VE 1.2.1 L670 compiled to run on NOS 2.5.1 L664/650 are contained on the permanent file tapes. For complete information, refer to the NOS IHB on how to obtain these binaries.

SYSGEN Validations

In order to install permanent files, SYSGEN must know the batch passwords of certain SYSTEM user names. For NOS 2.5.1 L670, SYSGEN now uses a procedure file named ZZSYSGU which contains the passwords that match those stored in the system validation files. All customers following the Upgrade Instructions in chapter 3 of the NOS IHB should load ZZSYSGU to user name SYSTEMX following the instructions in Step 6: INSTALL PERMANENT FILES of that chapter. If you have altered the system passwords, you must edit the file ZZSYSGU so that it matches your current passwords. We recommend that this be done on a regular basis for security reasons. Refer to SYSGEN Validations in Chapter 8 of the IHB for more complete information about ZZSYSGU.

Manual Errata

NOS Installation Handbook

The following items describe changes needed in Chapter 3 (Upgrade Installation) of the NOS Installation Handbook (Rev. H).

STEP 3: UPDATE CONFIGURATION FILES AND DECKS -- You should update the files in this step from an interactive terminal logged into user name INSTALL, except for the NDL file and files belonging to CDCNET. These can be updated on user name NETADMN.

In the CREATING OR UPDATING CONFIGURATION FILES section of this step, it refers you to Chapter 7 for information on installing CDCNET for the first-time or an upgrade. At this point, you should also execute the steps described in those sections. For example, if you are upgrading CDCNET, go to the CDCNET section of Chapter 7 and execute the steps under UPGRADING CDCNET. Be sure to disable loading of files PFGDCNS and PFGCHA2 in STEP5: OVERRIDE AUTOMATIC FILE INSTALLATION.

STEP 6: INSTALL PERMANENT FILES -- In part 6 of this step, the files that should be moved are the site-modified files that were created in STEP 3: UPDATE CONFIGURATION FILES AND DECKS. If you did not modify or create any configuration files in STEP 3, SYSGEN(MOVE) does not need to be executed.

Chapter 2

Analysis

Incompatibilities

This section describes any system incompatibilities with previously released NOS systems.

All Local PP Programs Must Be Reassembled

Changes to PPR entry points at NOS 2.5.1 L670 require that all sites reassemble any locally written PP programs.

TAF Procedure File Enhancement

The command CLASS(NS) has been added to the TAFPRC procedure file to enable the TAF job to roll out during job termination if any file local to the control point is inaccessible due to a disk failure. Previously, the TAF job would stay at the control point because it was a subsystem which could not be rolled. The job will remain rolled until the disk on which the file resides becomes accessible.

NOTE

The rolled job does not prevent another copy of TAF from being brought up.

Hardware Exit Mode 77

Error Exit Mode 77 is recorded in real memory address 0 when a CPU Halted Status is detected in the status summary register for CPU 0 and the CYBER 170 state operating system is active. This applies to CYBER 180 machines only.

Chapter 3 Operations

Incompatibilities

The following items describe incompatibilities in the operations area:

Mass Storage Verification

NOS has been modified to perform a hardware verification on all mass storage devices during the deadstart process before users are allowed to access the device. For all mass storage devices, 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. If a site wishes to keep deadstart time to a minimum, disk validation (i.e. hardware verification of mass storage devices) can be disabled via the "DISABLE, DISK VALIDATION." IPRDECK command.

IDLE Command Disabled For Non-mass Storage Devices

The DSD command IDLE,EQ= has been disabled for non-mass storage devices since it serves no useful purpose. Consequently, non-mass storage EQPDECK entries may not specify ST=IDLE.

Checkpoint System Command Change

The operating system console must be UNLOCKED before entering the following command:

CHECK POINT SYSTEM.

Chapter 4

End User

Notes and Cautions

This section describes system command changes made in the NOS 2.5.1 L670 system which affect the end user.

TRMDEF Changes

The TRMDEF command has been changed in the following ways:

1. TRMDEF attributes EOS, CRS, LFS, FFS and TM can now be set to a sequence of lower-case alphabetic characters by use of the hexadecimal character representation. This multiple character hexadecimal representation is already used by other attributes for single character representation.

Example: to set attribute EOS to lowercase 'abc', enter:

```
TRMDEF,EOS=X616263.
```

2. TRMDEF attributes TFC and TTC have a new syntax: instead of listing the 1-4 possible characters in a literal string, each unique character is separated by a '/'.

Example: to set attribute TTC to '+', '(', 'Z', or '*' enter any of the following:

```
TRMDEF,TTC=+(/Z/*.  
TRMDEF,TTC=$+$/($/$Z$/$*$.  
TRMDEF,TTC=X2B/X28/X5A/X2A.
```

3. TRMDEF now enforces the same set of attribute values as the CHATA/CHACA commands enforce for the parameters IEM, IOM, TCM, TLM, TTM and SA. Full and abbreviated entries have the same value.
4. TRMDEF no longer aborts when run from a batch job. An informative message is sent to the dayfile but TRMDEF terminates normally (i.e. EXIT processing does not occur).

NOTE

For more information on the use of TRMDEF with CDCNET, refer to the section called Migrating from CCP to CDCNET in Chapter 6.

SUMMARY Command Deleted

Support of the SUMMARY command has been dropped in this release of NOS. The ENQUIRE command can be used instead.

EFFECT Command And Macro Changes

The parameters for the EFFECT command and macro have been changed from ON and OFF to SYSTEM and USER. EFFECT,SYSTEM (the default) means that IAFEX supplies format effectors for output; EFFECT,USER means that the user or program must supply them.

A flag has also been defined in the two-word status block returned by the TSTATUS macro for user format effector mode; bit 6 of the second word will be set if user format effector mode is set.

Banner Page Change

The text descriptions for the installation service classes (that appear on the banner page) have been shortened from INSTALLATION CLASS n to CLASS In (where n is the service class). This change occurred because certain decks encountered serious space problems when the extra installation service classes were enabled.

HELP and HELPME Changes

HELP and HELPME commands have been expanded to provide help for NAM/CCP network commands. HELP now displays a 4-item menu instead of the old 3-item menu. The fourth item points to a list of network commands.

HELPME describes network commands from both the operating system perspective (TRMDEF) and the network perspective (<esc> <command>). The HELPME entry for a network command is simply the CCP mnemonic for the associated terminal attribute. For example, to get help pertaining to page waiting, you type the following:

```
HELPME,PG
```

If you don't know the mnemonic for the terminal attribute, you can view the list of mnemonics via HELP or query the HELPME information for TRMDEF:

```
HELPME,TRMDEF
```

As with other special cases (compiler calls, for instance), HELPME does not support command execution, it only provides help information.

HELP and HELPME will provide information about CDCNET commands in a future release. Meanwhile, you can get help by using the online manual CDCNET:

```
EXPLAIN,M=CDCNET
```


Chapter 5

Configuration Management

Notes and Cautions

Testing Environment

The NOS 2.5.1 L670 system was tested in an environment containing the following components:

<u>Hardware Component</u>	<u>Release Level</u>	<u>CIP Level</u>
Model 810 Microcode	M14AA13	V6 L670
Model 815 Microcode	M11AA13	V6 L670
Model 825 Microcode	M12AA13	V6 L670
Model 830 Microcode	M13AA13	V6 L670
Model 835 Microcode	M20AA15	V6 L670
Model 840 Microcode	M340X07	V6 L670
Model 845 Microcode	M310X09	V6 L670
Model 850 Microcode	M330X10	V6 L670
Model 855 Microcode	M300X08	V6 L670
Model 860 Microcode	M320X09	V6 L670
Model 990 Microcode	M40AX16	V6 L670
Model 990 Microcode	M41AX16	V6 L670
800 Series Environment Interface (EI)	Level 17	V6 L670
MDD	V12	V6 L670
SCD	V04	V6 L670
DFT	V02	V6 L670

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 2.5.1 L664/L670 to NOS 2.5.1 L664/L670 (RHF, NAM/CCP, and NAM/CDCNET)
- NOS 2.5.1 L664/L670 to NOS 2.4.3 (RHF and NAM/CCP)
- NOS 2.5.1 L664/L670 to NOS/BE 1.5 L650 (RHF)
- NOS 2.5.1 L664/L670 to VSOS 2.2.5 L654 (RHF)
- NOS 2.5.1 L664/L670 to IBM RHF 1.2.1 L652 (RHF)
- NOS 2.5.1 L664/L670 to VAX RHF 1.7 L658 (RHF)
- NOS 2.5.1 L664/L670 to CYBER 120 AOS/VS (NAM/CCP and NAM/CDCNET)

Chapter 6

CDCNET

The information contained in this chapter pertains to CDCNET as used in NOS, NOS/VE and NOS-NOS/VE dual state systems. Those sections specific to NOS or NOS/VE only are so indicated. The remaining material applies to CDCNET in all three types of network installations.

NOTE

If upgrading from CDCNET 1.0 L647 to CDCNET 1.1 L670 system, refer to the incompatibilities section, CDCNET chapter, of the NOS/VE 1.2.1 L664 SRB (SMD 131176), or the NOS 2.5.1 L664 SRB (SMD 131180), (which ever is appropriate). Information describing the incompatibilities between CDCNET releases 1.0 and 1.1 can be found in these SRB's.

Installation - NOS/VE Only

The following items describe installation of CDCNET in a NOS/VE system:

- Initial Installation
- Upgrade Installation
- CDCNET BCU Considerations

Initial Installation

The CDCNET portion of the initial NOS/VE installation process (described in the VE SRB) defines a single terminal that you use to configure the remainder of the CDCNET network. The configuration process involves modifying the files in the `$$SYSTEM.CDCNET.SITE_CONTROLLED` catalog. Before you can modify these files from the configuration terminal, you must grant permission to the logged in username to update either the entire catalog or individual files within the catalog. The `REPLACE_CONFIGURATION_FILE` command requires that you grant both `CYCLE` and `CONTROL` permissions because of the method the command uses to update the files. You must grant these permissions from the system console. For example:

```
create_catalog_permit c=$system.cdnet.site_controlled g=user ..  
fn=family-name u=user-name am=(all cycle control)
```

where "family-name" and "user-name" specify the family and username that is used to log into the configuration terminal.

Information on defining the network configuration appears in the CDCNET Configuration and Site Administration manual. Because of the limited number of site users who must use CDCNET host commands, they are not included on the default command list. Users who must use any of the CDCNET host utilities or maintain CDCNET configuration procedures should add the following command to their login prolog:

```
set_command_list a=$system.cdcnet.version_independent.command_library
```

Upgrade Installation

The upgrade to a new release or the installation of a Batch Critical Update, (BCU), creates a new version of CDCNET and changes the value of an indicator which determines which version of CDCNET is active. The indicator, a 4-digit hexadecimal number, called the CDCNET version level is found in 3 significant areas:

- In the catalog structure of the CDCNET permanent files the CDCNET version level identifies the subcatalogs containing the various versions of CDCNET. For example, \$\$SYSTEM.CDCNET.VERSION_vvvv, where vvvv is the CDCNET version level.
- In the value for the VERSION parameter of the DEFINE_BOOT_DEFAULTS command, the VERSION level indicator controls the level of the software to be loaded into all of the CDCNET Device Interfaces (DI's). This command is used by the CDCNET exception list file, (\$\$SYSTEM.CDCNET.SITE_CONTROLLED.EXCEPTION_LIST), to specify the default version level of CDCNET to be loaded.
- In the equivalent value of the CDCNET_VERSION variable, specified in the file \$\$SYSTEM.CDCNET.VERSION_INDEPENDENT.CDCNET_VERSION, The version level value indicates the default level of CDCNET host utilities; ANALYZE_CDCNET_DUMP (ANACD), MANAGE_CDCNET_CONFIGURATION (MANCC), and NETWORK_PERFORMANCE_ANALYZER (NPA).

Please note that not all CDCNET permanent files are stored under the various \$\$SYSTEM.CDCNET.VERSION_vvvv catalogs. CDCNET configuration files are contained in the \$\$SYSTEM.CDCNET.SITE_CONTROLLED catalog. These are the files that you must modify to describe the CDCNET configuration at your site. CDCNET software files that are version independent (that is, used by all versions of CDCNET software) are contained in the \$\$SYSTEM.CDCNET.VERSION_INDEPENDENT catalog.

When you upgrade to a new release or install a correction package, UPGRADE SOFTWARE (UPGS) automatically updates the default version level of the CDCNET host utilities to the new level. UPGS also installs new copies of the files in the \$\$SYSTEM.CDCNET.VERSION_INDEPENDENT catalog. To complete the installation, you must do the following:

- Update the newly installed files to reflect any modifications that you made to the previous versions of files in the VERSION_INDEPENDENT catalog. The new files are in the \$HIGH cycle, and the previous versions of the files are in the \$HIGH minus 1 cycle.
- Update the CDCNET exception list to the new level and reload your DI's. You can use the SET_VERSION_LEVEL command (described in appendix) to change the exception list.
- Delete any versions of CDCNET software that your site is no longer using, excluding the files that were originally installed with the first NOS/VE 1.2.1 L670 release. To do this, execute the commands shown below from the NOS/VE system console. Before executing the commands, be sure that your CDCNET exception list (file \$SYSTEM.CDCNET.SITE_CONTROLLED.EXCEPTION_LIST) and CDCNET version file (file \$SYSTEM.CDCNET.VERSION_INDEPENDENT.CDCNET_VERSION) do not reference the version of CDCNET you intend to delete. In a multi-host network, you should also be sure that no other host will request a load of the deleted level.

```
task ring=7
delete_catalog_contents $system.cdcnet.version_vvvv
delete_catalog $system.cdcnet.version_vvvv
taskend
```

where "vvvv" represents the version level of CDCNET that you wish to delete.

CDCNET BCU Considerations

To install a CDCNET Batch Critical Update, (BCU), the version level of CDCNET that was installed with the original NOS/VE 1.2.1 L670 must remain on the system. Do not delete these files; they are required for any subsequent BCU installations.

Installation - NOS Only

The following item describes installation of CDCNET in a NOS system:

- Installation from level 664
- Installation from level 647

Installation from level 664

For NOS systems, CDCNET 1.1. L670 is installed by following the "Upgrading CDCNET" or "Installing CDCNET for the First Time" instructions in the CDCNET section of chapter 7 of the NOS Installation Handbook, CDC publication number 60459320, revision H.

Installation from level 647

For customers upgrading from CDCNET Release 1.0 L647, the instructions in this section describe in general how to prepare for installation of CDCNET R1.1 while still running NOS 2.4.3 L647 and CDCNET R1.0. The instructions assume that the upgrade will be made to the new NOS and CDCNET levels at the same time and not mix the CDCNET and host levels. These instructions should make it possible to revert to the old levels if required.

All NOS, NAM and CDCNET permanent files from L647 and L670 can coexist except for the following:

1. INITDCN cannot because of changes regarding NOF/NETOU and NPA,
2. NAMSTRT cannot because of changes regarding NOF/NETOU,
3. DCNPLIB cannot because of changes NOF/NETOU and NPA.

In general, follow the instructions in chapter 3 of the NOS Installation Handbook Revision H for an Upgrade Installation. The following strategy is recommended:

1. Before beginning your installation, change the name of files INITDCN, DCNPLIB, and NAMSTRT. Make a copy of each file on the same user name with a different file name, e.g., INIT647, DCNP647, NAMS647.
2. Update configuration files and decks as indicated in step 3 of chapter 3 of the IHB, where you will be referred to the CDCNET section of chapter 7 to install CDCNET. Instead of performing an upgrade installation of CDCNET as the instructions indicate, perform an initial installation. Note the following:

- a. Only perform steps 1 and 3 of the initial installation since you will probably want to use your original network directory file and configuration files.
- b. Execution of step 3 in chapter 7 will cause files (INITDCN, DCNPLIB) and the exception list (file ELIST) to be temporarily updated to L670. To avoid possible problems, only execute step 3 when no one is using NOF/NETOS and when no DI load requests are expected. Immediately after step 3 completes:

- . Swap back to the INITDCN and DCNPLIB files (on user name NETADMN) saved earlier. For example, use the commands:

```
CHANGE,INIT670=INITDCN,INITDCN=INIT647  
CHANGE,DCNP670=DCNPLIB,DCNPLIB=DCNP647
```

- . Change the exception list back to the R1.0 level using the SETVL procedure:

```
BEGIN,SETVL,DCNPLIB,ELIST,V=vvvv
```

where vvvv is the R1.0 software version level currently loaded in the DIs.

3. Update DI configuration files as needed but save them with different NOS permanent file names and DO NOT add them to the network directory. By using different NOS permanent files, you can swap between the R1.0 and R1.1 configuration files simply by changing the network directory entries with NETFM. The new configuration files should be added to the directory only when you are ready to reload DI's with R1.1 software. Alternately, update the DI configuration files to include both new and old commands before the R1.1 upgrade. The system will execute normally except that Log 22 messages will appear for new commands when running R1.0, and for old commands when running R1.1.
4. Update the NDL file to contain the definitions for NETOU. Statements for NOF may be left in the NDL.
5. Continue with the instructions in chapter 3 of the NOS IHB until Step 5:OVERRIDE AUTOMATIC FILE INSTALLATION. Be sure to disable loading of PFGDCNS and PFGCHA2 since these files have already been loaded.
6. Next perform Step 6:INSTALL PERMANENT FILES as indicated in the IHB. Also note the following:
 - a. All log files should be terminated and reformatted before deadstarting NOS 2.5.2 since NPA is not compatible between the two releases.
 - b. Before executing SETVL to set the version level for the new CDCNET software, switch to the new INITDCN and DCNPLIB files, i.e.:


```
CHANGE,INIT647=INITDCN,INITDCN=INIT670  
CHANGE,DCNP647=DCNPLIB,DCNPLIB=DCNP670
```
 - c. Execute SETVL to update the exception list to the new CDCNET level:


```
BEGIN,SETVL,DCNPLIB,ELIST,V=vvvv
```


where vvvv is the R1.1 software version level.
 - d. Manually RESET all DI's before deadstarting NOS 2.5.2 to force them to load R1.1 software.
 - e. Use NETFM to activate any changed DI configuration files.
 - f. The NOS 2.5.2 NAMSTRT file will be loaded automatically in this step.
7. After NOS 2.5.2 is deadstarted and NAM comes up, all DIs will be reloaded with CDCNET R1.1 software.

Should you need to back up to the previous level of NOS/CDCNET for any reason, you must swap back the R1.0 L647 DCNPLIB, INITDCN, NAMSTRT and configuration files and update the exception list to refer to CDCNET 1.0 software.

L664 Problems Corrected

The following CDCNET problems documented in the L664 SRB have been corrected in CDCNET 1.1 L670.

- Network Performance Analyzer (NPA) Deficiencies - NOS/VE Only
- Comments on Configuration/TDP/TUP Files
- NAM/VE Attribute Difference - NOS/VE Only
- Hold Page Does not Work - NOS/VE Only
- Invalid Routing Tables Possible - NOS/VE Only
- Incorrect Processing of FN 57 and FN 58 - NOS Only
- Batch Device Accounting Message - NOS Only

Network Performance Analyzer (NPA) Deficiencies - NOS/VE Only

1. Log file data that is statistical in nature is condensed by NPA REFCLF into statistical intervals (typically one hour) and recorded to the appropriate statistical data bases. On NOS/VE, the data for the last two statistical intervals for these data bases will not be reflected on the corresponding reports.

PSR AC1E567

2. NPA Reports Cause CRECAR Command Error - NOS/VE Only Under certain circumstances NPA reports SFTWRP3, EVNTRP3 and ETHRRP2 cause a CRECAR command error 'Invalid BDP Data'. The reports are not produced when this condition occurs.

PSR AC1E569, AC1E570

3. Large Log Files May Cause REFCLF Abort On NOS, REFCLF may abort with the following message when processing very large log files (>12000 PRUs):

NO MEM FOR NEW STCK SEG

If this occurs, reissue the identical command successively until a normal termination is achieved. REFCLF will bypass the log records already processed and continue from the point of the abort. It is important to continue this process until normal termination. If not, a NPA data base may be left in a condition that will cause a subsequent CRECAR command to abort with a CRM ERROR.

PSR AC1E631

To avoid this problem, terminate the current log file more frequently to reduce the resultant log file size. Another alternative is to utilize the REFCLF time and date parameters to bracket a smaller segment of a large log file.

PSR AC1E583

Comments on Configuration/TDP/TUP Files

The command parser in CDCNET incorrectly diagnoses a statement error under some circumstances where comments are the only constructs on a line and where leading spaces precede the initial quotation symbol. To avoid this problem, put the initial quotation symbol in column 1 of all comment-only lines.

PSR AC1C972

NAM/VE Attribute Difference - NOS/VE Only

CDCNET allows CRD and LFD values in the range 0..1000 and FFD in the range of 0..3000. NAM/VE allows these attributes in the range 0..999. When using NAM/VE if values for these parameters greater than 999 are required, the CDCNET command must be used to set them.

Hold Page Does not Work - NOS/VE Only

In certain cases for a terminal connected to NOS/VE, hold page will not be processed when output consists of lines of exactly PAGE_WIDTH (PW) characters to be output.

Invalid Routing Tables Possible - NOS/VE Only

A Routing Information Data Unit (RIDU) which shows an added or deleted network (lowest numerical network ID), or the first RIDU from a particular DI may be ignored in a receiving DI based on the value of an uninitialized variable. The consequence of this is invalid Routing tables which makes it impossible for the DI to communicate with some other DIs or a NOS/VE host. Since only MDIs to NOS/VE hosts generate RIDUs, this can only happen to TDIs in NOS/VE environments. The effect is that the TDI cannot communicate with the host, and command processors (kept on the host) cannot be loaded. A TDI on loading might reset with reset code 'NO_CONFIGURATION_FILE_OBTAINED' 1B(16). A DI dump file can be examined to determine if any of the above situations have occurred.

There is no guaranteed workaround. However, MDIs between NOS/VE hosts and Ethernet LANs are the only systems which generate RIDUs. Making the network ID of the channelnet between the MDI and the host numerically higher than the Ethernet (as in default CDCNET configuration files) will make this problem less likely to occur. If the above mentioned reset occurs, the TDI may initialize successfully the next time. Once the catenet is stable, this problem cannot occur.

PSR AC1E632

Incorrect Processing of FN 57 and FN 58 - NOS Only

The CTRL/CHAR/R message is rejected by CDCNET when FNs 57 and 58 are requested with zero values. This is the recommended method for deselecting transparent message forwarding on message length. However, until this problem is fixed, these FNs should not be requested with zero values. In order to deselect transparent forwarding on message length, send the CTRL/CHAR/R message without specifying FN 57 or FN 58.

Batch Device Accounting Message - NOS Only

The SCTE C2, C4 and C5 NOS Account File messages are not correct for batch devices. Incorrect information is reported.

PSR AC1E444

Significant Problems

The following items describe significant CDCNET problems:

- SYNCHRONIZE_CLOCK Command Problem
- Dump Analyzer (ANACD) Deficiencies
- MANCC Deficiencies
- Log Files in Date/Time Order
- Automated Command Entry At Initial Connection May Fail
- Line Hangs
- KILL_SYSTEM DUMP Parameter not Honored
- Network Performance Analyzer (NPA) Deficiencies - NOS/VE Only
- MDI/MTI Resets During Host Mainframe Maintenance - NOS/VE Only
- No Output From 53X Printer - NOS/VE Only
- Congested MDIs - NOS and NOS/VE Dual State
- Unrecognized NETOU Secondary User Statements - NOS Only
- NOS Login - NOS and NOS/VE Dual State
- No Disconnect for IAF Inactivity Timeout - NOS Only
- NETFM Local File Name Change - NOS Only
- Misleading A-A Connection Failure Reason Codes - NOS Only
- First Time Installation Without FSE - NOS Only

SYNCHRONIZE_CLOCK Command Problem

SYNCHRONIZE_CLOCK (SYNC) command to an NDI across an X.25 Network Solution link may cause the NDI being synchronized to reset with a stack overflow error (reset code 3B). The clock can be set by sending a SET_DATE_AND_TIME (SETDAT) command to the NDI.

PSR AC1E863

Dump Analyzer (ANACD) Deficiencies

1. There are two problems associated with the DISPLAY_DATA_QUEUE subcommand.
 - a. ANACD does not terminate if the circular queue LSA_PRESERVE_QUEUE is displayed with DISPLAY_DATA_QUEUE. If this queue must be inspected either use DISPLAY_MEMORY or use DISPLAY_DATA_QUEUE interactively only and terminate with a user terminate break when sufficient output has been generated.
 - b. On NOS/VE only, if an output file is specified on the DISDQ subcommand then the buffer chain part of the display will not go to the designated file but to a file with a name of the form \$nnnnnn in the current working catalog. The nnnnnn used to form the name of this output file is taken from the first six characters of the system allocated local file name.
2. When running under the NOS/VE operating system with the output of the \$ERRORS file directed to another file via the CREATE_FILE_CONNECTION (CREFC) command, only the last ANACD error message is saved on the connected file. To receive all error messages for a dump analyzer session in an external file, the output of both the \$ERRORS and \$RESPONSE files should be directed to the same external file, specifying a file position of \$EOI as part of the file reference. The following example connects standard files \$ERRORS and \$RESPONSE to file \$LOCAL.DAERRORS. The file is positioned to the end of information prior to its use.

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

MANCC Deficiencies

1. When CRECF is used to create a system configuration file for a TDI, a DEFINE_ETHER_NET (DEFEN) and a DEFINE_ETHER_TRUNK (DEFET) command are included in the configuration file; in both commands, the TRUNK_NAME (TN) is given a default name of ETHERNET1. Neither of these commands is required in a TDI system configuration file, as they are performed implicitly by the TDI software load process. The presence of these commands in the configuration files does not adversely affect the loading and configuration process. However, log messages and operator alarms may be issued during configuration indicating that the trunk and network are "already defined". If these commands are present in a TDI configuration file, it is recommended that network administration and operations personnel be advised that these log messages and alarms are not a cause for concern. Additionally, the implicit trunk and network definition by the load process assigns a trunk name of \$ESCIx, where x is the slot number in the DI that contains the ESCI card, and the network name of \$NET_xxxxxxxx, where xxxxxxxx is the ETHERNET network identifier. These names should be used, where needed, on any commands in the TDI configuration file or on any commands that mention this ETHERNET trunk or network solution name. Note that both the DEFINE_ETHER_NET and DEFINE_ETHER_TRUNK commands are required in an MDI configuration file, as the MDI load process does not implicitly perform the network or trunk definition.

2. The same problem described above also applies to both TDI and NDI files created in the EDICF environment using the TDI and NDI configuration templates.
3. When running under the NOS/VE operating system and the output of the \$ERRORS file is directed to another file via the CREATE_FILE_CONNECTION command, only the last MANCC error message is saved in the connected file. 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, specifying 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
```

Log Files in Date/Time Order

NPA REFCLF uses an incorrect assumption that all log files are in increasing date and time order. Because of this assumption, REFCLF can reprocess data that it has previously processed resulting in misleading reports. This may also cause some data to never be processed, resulting in misleading reports.

PSR AC1E105

Automated Command Entry At Initial Connection May Fail

At initial connection to CDCNET once the line "You may enter CDCNET commands." has been received, the user is supposed to be able to enter commands and have them accepted by CDCNET. If a TUP is automatically invoked that sends several lines of output, commands entered too quickly may be discarded. The failure will be diagnosed with the message "Input discarded.". The message "Output discarded." may also be received. In the cases where this problem has been encountered, it has been avoided by delaying a few seconds after receipt of the "You may enter..." message before sending the first command. The particular failure that has been investigated involved 8 short lines of output from the TUP. In this case a 3 second delay in the PC based automatic login process was sufficient to work around the problem at 1200 baud.

PSR AC1E851

Line Hangs

If characters other than carriage returns are entered as part of the auto recognition sequence, the speed of the line may be incorrectly determined. If the line speed is incorrect, the line will often remain hung in the auto recognition active state, until the terminal is reset or the line is disconnected. When initially connecting to CDCNET and this condition occurs,

a user will often realize what has happened. However, if the user thinks that he/she is still connected to the network, the user may not realize the line is hung in this condition. For example, assume a user is connected to a NOS/VE host at 19.2KB. The user leaves the terminal. The TDI to which the user is connected resets. The user returns to the terminal assuming it is still connected and enters "SCU" followed by a carriage return. The line will now be hung in auto recognition. A break key or a terminal reset/line disconnect will allow the user to auto recognize successfully.

If a user detects no response from his or her terminal when initially connecting to CDCNET and a terminal reset will not correct the situation, the Network Operator should perform the following steps:

1. Verify that the line is configured correctly.
2. Enter DISLS to check the state of the line. If the state of the line is 'auto-rec active' or 'enable', then try the following sequence to clear the condition:
 - . Stop the line (STOL) and start the line (STAL);
3. If the STOL/STAL does not clear the line, then run on-line diagnostics for that line (STAPT) or if other lines on the Line Interface Module (LIM) are free, run the on-line diagnostics for the LIM (STALT). If the on-line diagnostics fail, proceed as directed by the diagnostics.
4. If on-line diagnostics indicate no problems but the terminal still does not respond and the line state (DISLS) shows that the line is not "active", then run on-line diagnostics on the next lower number LIM on which no lines are active. Repeat this step until the line is cleared or the next lower number LIM has lines active.
5. If this process does not clear the line, then the line must be cleared by a MTI or TDI reset.

NOTE

This problem has occurred after a MDI or TDI has been reloaded with a new level of CDCNET.

KILL_SYSTEM DUMP Parameter not Honored

In a NOS/VE network, the KILL_SYSTEM DUMP parameter is not honored. Dumping of the MDI is governed solely by the EXCEPTION_LIST file. In order to use the KILL_SYSTEM DUMP parameter, the EXCEPTION_LIST file should be updated so that reset code 32(16) causes a DI dump and reset code 33(16) does not. Reset code 32 is the code generated as the result of KILL_SYSTEM DUMP=YES and reset code 33 is the code generated as the result of KILL_SYSTEM DUMP=NO.

Reset codes are selected/deselected for dump by using the ADD_DUMP_ON_ERROR and DELETE_DUMP_ON_ERROR parameters of the EXCEPTION_LIST file commands DEFINE_BOOT_DEFAULTS and DEFINE_EXCEPTION_SYSTEM.

Network Performance Analyzer (NPA) Deficiencies - NOS/VE Only

1. NPA does not produce the accounting data base NPBACNT. No data is written if ACNT is selected when reformatting log files.

PSR AC1D353

2. The NPA subcommand RELOAD_NPA_DATA_BASE does not work.

PSR AC1D354

3. When executing REFCLF you must specify the complete file path name of the log file to be processed, it will not process the \$SYSTEM.CDCNET.LOG file by default. If the log file specified contains multiple cycles, you must supply the cycle numbers to REFCLF, (in ascending order, from \$LOW to \$HIGH), in order to have the log files processed in the proper order. By default, REFCLF only processes the highest cycle.

PSR AC1E622.

4. REFCLF does not correctly process multiple log files on a single run. Until this problem is corrected, specify only one log file per REFCLF execution.

PSR AC1E516

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. Since the mainframe under maintenance is not actively connected to the network, there is no user impact or problems with other CDCNET devices or mainframes in the network when this problem occurs. The reset will result 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 will be recorded in the DI's System Configuration Table and can be accessed with the CDCNET Dump Analyzer command Display_System_Config_Table (DISSCT). This time can be used to confirm that the DI reset was the result of a maintenance action.

No Output From 53X Printer - NOS/VE Only

A 53X printer used with the NOS/VE batch output facility may get into conditions where the printer stops or doesn't start printing. Three symptoms have been observed to cause these conditions. They are described below along with two corrective actions to clear the condition:

- A printer stops in the middle of a listing and nothing seems to be wrong with the printer. The batch device status display (from OPERate_Station) shows the device as active, the file transfer status as busy and a file assigned to the device.
- A printer is not printing anything, but the batch device status display (from OPES) indicates that the file completion percentage keeps increasing.
- A printer repeatedly gets a SENDER ERROR on one particular file at about the same place in the listing. After awhile the file may print on a different printer without any problem. The error can be seen by looking at the last lines of the listing. The last lines printed will indicate whether the transfer was completed normally or not. If not, the reason is included.

These conditions can be cleared by one of the following methods:

- Turn the printer power off, wait 2-5 seconds, and then turn the printer back on.
- Use the Network Operator Utility (NETOU) to send the stop_line (STOL) and start_line (STAL) commands to the specific DI and line connected to the printer.

Either of these methods will clear the condition by disabling and re-enabling the line. The file assigned to the device will be queued again and printed later.

Congested MDIs - NOS and NOS/VE Dual State

During periods of peak loads, a NOS MDI may enter a buffer congested state. When this happens, the MDI will not accept any output from the host. Until the condition clears, all connections to the host will be affected, and no new connections will be accepted. Terminal users may see a delay in receiving their output. Responses to commands entered via NETOU may also be delayed because the commands are being held back in the host. This condition is temporary and allows the MDI to improve its buffer state. In cases of extreme memory fragmentation and buffer congestion, the MDI may not be able to recover and should be reset if the condition lasts for more than five minutes.

Unrecognized NETOU Secondary User Statements - NOS Only

NETOU does not recognize secondary user control statements when processing EXECUTE_COMMAND_FILE commands. The default catalog for command files reverts to the user name specified at login. In addition, when requesting command files from alternate catalogs, if the file is private, the user name specified at login must have been explicitly permitted for the file.

NOS Login - NOS and NOS/VE Dual State

If a NOS login being entered through CDCNET is terminated abnormally prior to completing the entry, the ELP (END_LINE_POSITION) and EPP (END_PARTIAL_POSITION) terminal attributes are left set to NONE resulting in no line feed or carriage return for all future input. This condition can be corrected by entering a CHATA command (CHATA,ELP=LFS,EPP=CRS) or by completing a login.

PSR AC1D937

No Disconnect for IAF Inactivity Timeout - NOS Only

Non-working connections with output_action set to HOLD are not disconnected by the network when timed out by IAF. A side effect is that the CCT (CONNECTION_CONNECT_TIMEOUT) timer will not expire for switched lines causing the switched lines to remain connected after the connections associated with the line have all timed out. Users using multiple connections on switched lines should either hang-up at the end of their sessions or ensure that all connections have been disconnected before leaving their terminals. Sites may elect to limit the number of connections on switched lines to one to prevent this occurrence.

NETFM Local File Name Change - NOS Only

NETFM CREATE, UPDATE, and VERIFY commands cause NETFM to attach the permanent file being processed using a local name ZZZZZFM (instead of the actual filename as it did previously) in read mode. If a file is already attached in write mode (for example, a file was just defined), NETFM is not able to attach the file - resulting in a NETFM error. The write attached file should be returned before NETFM is called.

Misleading A-A Connection Failure Reason Codes - NOS Only

The reason codes reported to an application when an A-A connection attempt fails are misleading. This can cause difficulty in debugging the configuration definitions for A-A paths. In particular, a number of distinct connection failure conditions are being reported under reason code 146 (decimal). Unique reason codes will be provided in a future release.

First Time Installation Without FSE - NOS Only

Installation and operation of CDCNET requires the NOS Full Screen Editor. The instructions in the NOS IHB for installing CDCNET for the first time during a system upgrade (Chapter 3 and CDCNET section of Chapter 7) indicate that CDCNET should be installed while running the user's earlier version of NOS. If the earlier version of NOS does not contain FSE, the installation will fail. To work around this problem, delay the installation of CDCNET until NOS 2.5.1 has been deadstarted. (It is assumed that FSE is included

with NOS 2.5.1 because it is required by CDCNET.)

This problem only applies to users who do not run FSE on the system from which they are upgrading.

Notes and Cautions

The following items describe CDCNET notes and cautions:

- X.25 Network Solution Feature
- CYBER 120 File Configuration
- Multiple Interactive Connections
- CREATE_CONNECTION Commands in Process
- Non-Default Buffer Allocation Parameters
- Alarm/Log message Definition
- CIM Configuration Limitations
- LIM Configuration Caution for Synchronous Lines
- Rotary Support
- Changes in NPA REFCLF
- Accessing CDCNET Permanent Files - NOS/VE Only
- CDCNET DI as only Network Hardware - NOS Only
- 63 Character Set Not Supported - NOS Only
- LCF Control Limitations for Auto Login - NOS Only

X.25 Network Solution Feature

The X.25 Network Solution feature is available with release L670 for NOS to NOS and NOS/VE to NOS/VE application to application (file transfer) usage. This network solution can connect two CDCNET networks via a dedicated line or X.25 Public Data Network (PDN). If two CDCNET networks are connected by X.25, each network must have a mainframe for loading DI's in its portion of the network; DI's cannot be loaded over X.25. Terminal to application usage has not been tested and is not recommended. NOS to NOS/VE file transfer is not supported with L670.

Line utilization on X.25 Network Solution communication links can vary widely depending on how the link is being used and how the configuration/tuning parameters are set. Testing has shown that for some cases the standard defaults are not yielding optimal line utilization. At this time, we do not have any guidance for tuning of this area. Contact Central Software Support if more assistance is needed in this area.

1. Configuration Limitations

X.25 Network Solution at L670 is limited to one trunk connected to a dedicated NDI. Trunk speeds from 4800 bps to 56,000 bps are supported using either RS232 or RS449 LIM hardware. Installing more than one LIM in an NDI supporting X.25 Network Solution may cause usability problems in the NDI and is not recommended.

2. General Network Configuration Recommendations

- a. Defining each site connected by an X.25 Network Solution to separate log groups will significantly decrease logging traffic across the trunk. Each DI at a site should be configured to log to a log group recorder on an MDI connected to a local NOS host mainframe or to the local NOS/VE host. This can be done using the log_group parameter in the Define_Source_Log_Group (DEFSLG) command in the configuration files.
- b. When connecting networks with an X.25 Network Solution, each network solution throughout the combined network must have unique network identifiers (network_id parameter in the Define_Ether_Net, Define_Channel_Net and Define_X25_Net commands). If the network identifiers are the same, the X.25 network link can indicate a status of active but data will not transfer across the link.
- c. When the DI's at the two ends of an X.25 Network Solution are configured with different network identifiers for the Network Solution (the NI parameter on the DEFXN command), the DI can reset when the DI's try to initialize the link.

3. X.25 Configuration Recommendations

- a. Small packet sizes should be used with X.25 links connected by modems. A maximum default_packet_size = 256 is recommended for this parameter in the Define_X25_Interface (DEFXI) command.
- b. The default value of the pf_recovery_timer parameter (500) in the Define_X25_Trunk (DEFXT) command is recommended only for 56kb trunk speeds. The parameter value prt = 7000 was used when testing a 4800B trunk.
- c. For directly connected X.25 links (that do not go through a PDN) without modems using RS232 LIMs the clocking parameter should be set to TRANSMIT in the Define_X25_Trunk command in both NDI configuration files. The clocking parameter must be set to external (default) when using modems.
- d. For directly connected X.25 links using 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. Only the DTE configured end of the trunk should be strapped for internal clocking with the associated NDI configuration file defining clocking = TRANSMIT in the Define_X25_Trunk command 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.
- e. For directly connected links using RS449 Model A LIMs with modems, strapping of the LIMs will be 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 with the associated NDI configuration files defining clocking = EXTERNAL (default) in the Define_X25_Trunk commands.
- f. Defining large values for range parameters and/or default_packet_size may cause depletion of buffer resources. If NDI buffer status, as displayed by the Display_DI_System_Status command from NETOU,

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.

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 and port 1 for external clocking on both LIMs.

```
define_system sn=ndi_remote
define_x25_trunk l=0 p=1 tn=remote_trunk m=dce c=external rl=20 ..
    ts=56000 dps=256
define_x25_interface in=remote_p1 tn=remote_trunk tr=(1..32)
    pdn=ve_test lda='3'
define_x25_net tn=remote_trunk ni=3456(16) rda='1' nn=remote_ns

define_system sn=ndi_local
define_x25_trunk l=0 p=0 tn=local_trunk m=dte c=transmit rl=20 ..
    ts=56000 dps=256
define_x25_interface in=local_p1 tn=local_trunk tr=(1..32) ..
    pdn=ve_test lda='1'
define_x25_net tn=local_trunk ni=3456(16) rda='3' nn=local_ns
```

Commands are described in the CDCNET Network Operator Utility Manual (60461520).

CYBER 120 File Configuration

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 and change the second hexadecimal coded character pair in the NPN file, PTFSAOS, to 80 so that the value C00000... becomes C08000....

Multiple Interactive Connections

CDCNET 1.1 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. A site which plans to heavily utilize the multiple connection environment should monitor the memory and buffer states of the DIs in order to determine if additional memory is required. Also see section CDCNET R1.1 DI Memory Requirements for configuration information.

CREATE_CONNECTION Commands in Process

The CREC command does not complete until the selected service has accepted or rejected 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 an extended period of time. While the CREC command processor is waiting for a response from the service, the users working connection is the connection from which the CREC command was issued and the user is put in solicited input mode. While in solicited mode, user input will be accepted by the network but will not be processed until the CREC command completes. The user is essentially locked out until the CREC command completes.

The user can enter the Break or Attention character during this time to cause input to be processed. A message received from the network operator during this time will also cause input to be processed. The input following either of these events will be treated as a command and discarded if the CREC command had been issued from the \$CDCNET_Command connection. If the CREC had been entered from an \$I/O connection, the input will be forwarded on that I/O connection and any output from that connection will be delivered to the terminal. In either case, until the CREC command completes, the connection from which the CREC command was issued remains the working connection and no terminal user commands will be processed.

Non-Default Buffer Allocation Parameters

For CDCNET 1.1, CDC strongly recommends that the released default settings for buffer sizes, buffer percentages, various memory and buffer congestion thresholds and stack sizes (specified on the DEFINE_SYSTEM (DEFS) command in the configuration procedures) be used. Some non-default settings of these parameters are known to cause problems.

Alarm/Log message Definition

1. The released DI configuration files created during installation do not cause message number 74 to be logged. Add the following command to all configuration files after the initial define_source_log_group command:

```
change_source_log_group add_message_number=74
```

2. The configuration files produced using MANCC are also in error. Add the following two commands for logging and alarms to configuration files produced by MANCC:

```
change_source_log_group..  
  add_message_number = (74,550,551)  
define_source_alarm_message..  
  message_number = (550,551)
```

CIM Configuration Limitations

CDCNET 1.1 allows only one terminal protocol to be supported by a Communications Interface Module (CIM), i.e., ASYNC or HASP. For example, in order to reconfigure a CIM from supporting ASYNC to supporting HASP, the DI configuration file must be updated and the DI must be reset.

LIM Configuration Caution for Synchronous Lines

The clocking parameter on the DEFL command has a default value of INTERNAL. This means that the LIM will generate the required clocking signals for transmit and receive (with NULL modem cable TN109). If the terminal provides the transmit clock, set this parameter to TRANSMIT (with NULL modem cable TN109). Note that most terminals will generate the transmit clock as defined by the RS232 standard. When using a modem, this parameter must be set to EXTERNAL, (and use modem cable TN108), since the modem will generate both clocking signals. Inappropriate selection of INTERNAL clocking can cause data to be received with errors or not at all.

Rotary Support

CDCNET is currently not capable of "busyng out" modems. If a communications line connected to a rotary is taken out of service, the rotary will become blocked, resulting in 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.

Changes in NPA REFCLF

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 below). 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.

Accessing CDCNET Permanent Files - NOS/VE Only

All CDCNET "data" files are private files under the NOS/VE \$SYSTEM family. Any user having a need to access any of these files or catalogs must be granted explicit permission using the `CREATE_CATALOG_PERMIT (CRECP)` or `CREATE_FILE_PERMIT (CREFP)` commands. The following lists the catalogs/files in the \$SYSTEM.CDCNET catalog with a brief description:

Item	Description
SITE_CONTROLLED	Catalog of configuration files
DUMP	Catalog containing DI dumps
LOG	File containing network LOG files
ANALYSIS	Catalog of NPA database files from processed LOG files.

The CRECP and CREFP commands are documented in the SCL System Interface Manual (60464014).

CDCNET DI as only Network Hardware - NOS Only

CDCNET accounting information, described on page 6-32, is written to the NOS account file by CS; additional types of information are written by CDCNET to log files created by NETLS. Therefore, even if no NPUs are present in the communications subsystem, CS must run if these account file messages are to be generated. CS will not initialize unless a network configuration file (NCF) is present. CDCNET-only systems will 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 NDLP.

```
NCFFILE : NFILE.  
END
```

The local file NCFFILE generated by NDLP should be made permanent as a 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 achieved 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.

```
JOB(JOBCS,CS,SY,NS,DI) 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 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,SY,NS,DI) NS JOB.

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

63 Character Set Not Supported - NOS Only

CDCNET does not support hosts running in 63-character mode.

LCF Control Limitations for Auto Login - NOS Only

Since CDCNET lines and terminals are not described in the NCF (as NPU lines are) it is not possible to supply auto login information in the LCF for a given terminal. It is possible, however, to specify auto login information for all terminals that access the host through a particular MDI/MTI. Include auto login information in the LCF for all of the terminal names that may be generated by the algorithm described in NAM Terminal Name Generation, on page 6-33.

Operational Considerations

The following items describe operational considerations for CDCNET:

- NOS-NOS/VE MDI Differences
- CDCNET R1.1 DI Memory Requirements
- Access Procedures for ANACD, MANCC and NPA - NOS/VE Only
- ANACD - Dump Analyzer
- Flow Control
- DI Clock Maintenance
- NPA
- Excessive Logging
- Recommendations for Logging Configuration
- NAM/VE Attribute Management Differences
- Access Path Determination - NOS Only

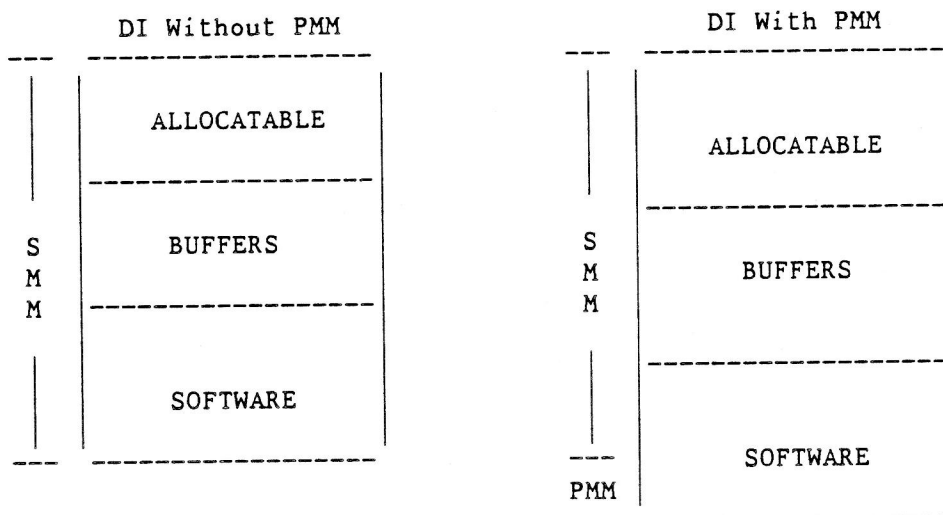
NOS-NOS/VE MDI Differences

NOS MDI/MTI configuration files can not be used for configuring NOS/VE MDI/MTIs. Specific details are described in CDCNET Configuration Site and Administration Guide (60461550).

CDCNET R1.1 DI Memory Requirements

1. Overview of DI Memory Usage

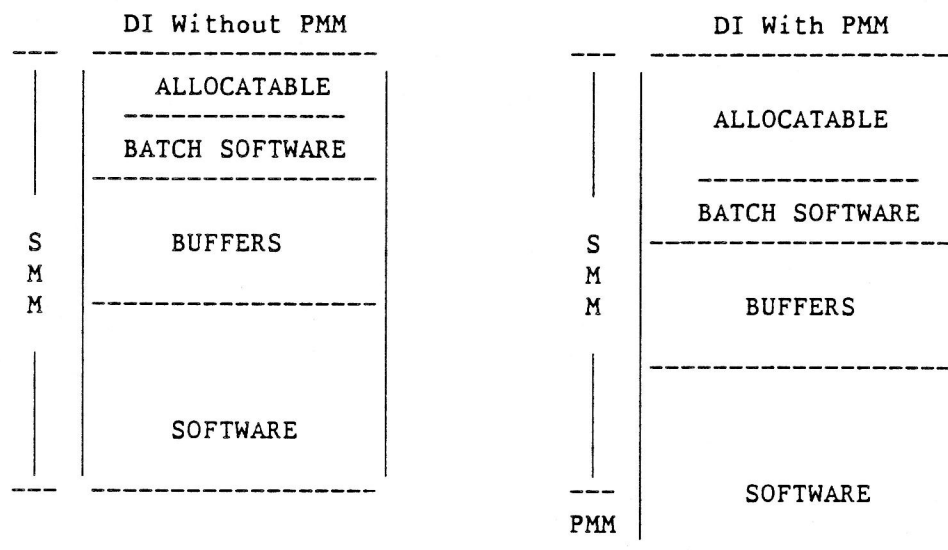
To understand the memory requirements for the supported DI configurations, it is useful to review how DI memory is utilized. After initialization of the DI, the software loaded is the basic network communication services needed by the DI, and the configuration file services specified in the configuration file. At the end of configuration, a contiguous block of memory is used by software, and the remainder of memory is free for other use. The DI system divides the free memory into two parts: buffers, and allocatable memory. Buffers are used to hold the messages for terminal users and for other services needed by the DI. Allocatable memory is used for tables, and for the loading and execution of additional software (e.g., command processors and software for services started on demand), and for tables used by network management functions. After the division of free memory, DI memory appears as shown below.



The basic memory requirements for DI software are about 500K bytes. For a TDI, the basic requirements, include the requirements for interactive services and the Asynchronous TIP. A 1 MB DI without PMM has about 250K bytes for buffers and about 250K bytes for allocatable memory. A 1 MB DI with PMM has about 315K bytes for buffers and 315K bytes for allocatable memory.

60K bytes of allocatable memory should be reserved for the loading of transient software and for network management functions. This leaves about 190K on a 1 MB DI without PMM for device configuration and connection tables and about 255K on a 1 MB DI with PMM. On a TDI, each configured device (e.g., asynchronous terminal or batch device) requires about 2K to configure. Each connection established for an interactive or batch user requires 4K bytes. A 1 MB TDI can support 32 terminals each with one active connection, i.e., $190K / (4K - 2K) = 32$ connections.

A TDI with batch terminals requires an additional 35K bytes to load the batch processing software. The batch software is typically loaded as the communications lines for batch terminals and printers become active and after the basic configuration is complete. The memory to load the batch software is taken from allocatable memory, thereby reducing by 35K memory available for device configuration and connection tables.



The addition of batch services reduces the amount of allocatable memory to about 155K on TDI without PMM and 220K on a TDI with PMM (note that NOS PSU is handled as an interactive process rather than a batch process, and does not require the loading of batch software). On a TDI with the HASP TIP, allocatable memory required for software increases to 50K. Thus, the allocatable memory for device configuration and connection tables is reduced to 140K for a 1MB TDI, and to 205K on a 1MB TDI with PMM. Note that the same calculations apply to a NOS/VE MTI. A NOS MTI, however, is a different story because additional connection tables are needed to gateway CDCNET connections into NOS hosts. This increases the allocatable memory required for each active connection to 6K from the 4K seen on a TDI. A NOS MTI also requires 55K bytes more memory for basic software than a TDI. Thus, the allocatable memory for device configuration and connection tables is about 200K on a 1MB NOS MTI with PMM. A 1 MB NOS MTI with PMM will support 25 interactive terminals each with 1 active connection.

- The following Guidelines summarize this analysis and demonstrate how they can be applied.

One Megabyte TDI Memory Support (1 SMM board, no PMM)

32 ASYNC lines can be configured with a maximum of 32 connections. For NOS, PSU printers in place of ASYNC terminals do not increase memory usage.

Guideline 1 Each ASYNC Interactive terminal takes 2K bytes to configure, and an additional 4K bytes for each active connection. Note that a line can be configured to allow multiple connections.

Guideline 2 VE batch printers add 35K bytes beyond the 1 MB TDI support. If VE batch printers are to be configured on a TDI, fewer lines (2K bytes each) must be configured, or fewer connections must be allowed. An alternative is to add memory with either PMM or SMM. Added memory only counts 50% towards DI terminal buffer availability. PMM adds 64K bytes, SMM adds 512K bytes towards DI terminal buffers.

Guideline 3 HASP I/O stations add 50K bytes beyond the 1 MB TDI memory requirement. If HASP I/O stations are to be configured on NOS or NOS/VE, fewer lines or fewer connections must be configured. An alternative is to add memory with either PMM or SMM. If both HASP I/O stations and ASYNC printers are configured for NOS/VE, add 50K bytes beyond the 1 MB memory requirement (ASYNC printers do not add any additional memory requirements beyond HASP). Each active HASP I/O station device takes an additional 6K bytes. A minimum HASP I/O station has two devices, a printer and a console. Therefore, a minimum HASP I/O station will require 12K bytes when it is active.

Example 1 TDI with 21 ASYNC terminal (1 connection each), and 1 HASP I/O station with two devices could be supported in a 1 MB TDI. Memory usage using Guidelines 1 & 3 is:

ASYNC Terminal Savings = $(32 - 21) * 6K = 66K$ bytes
HASP I/O station Addition = $50K + 12K = 62K$ bytes

Example 2 NOS/VE TDI with 25 ASYNC terminals (1 connection each), & 1 ASYNC printer is supported in a 1 MB TDI. Memory usage using Guidelines 1 & 2 is:

ASYNC Terminal Savings = $(32 - 25) * 6K = 42K$ bytes
ASYNC Printer Addition = $35K + 6K = 41K$ bytes

EXAMPLES for TDI MEMORY SUPPORT

CONFIGURATION	ASYNC TERMINAL	ASYNC with HASP	VE ASYNC with ASYNC Printers
1 Megabyte TDI	32 ASYNC 32 Connections	21 ASYNC, 1 HASP, 22 Connections	25 ASYNC, 1 ASYNC Printer, 26 Connections
1 Megabyte TDI with PMM	32 ASYNC 48 Connections	28 ASYNC, 2 HASP, 30 Connections	Can intermix ASYNC & Printers 39 Connections
2 Megabyte TDI (2 SMM boards)	32 ASYNC 96 Connections*	28 ASYNC, 4 HASP, 96 Connections*	Can intermix ASYNC & Printers 96 Connections*

ASYNC - ASYNC Terminal (9.6K bps)
ASYNC Printer - CDC 536 Printer (9.6K bps)
HASP - HASP station (9.6K bps) with two devices
* - Current testing limit is 96 connections

3. NOS MTI memory Configuration (minimum MTI with 1 SMM, one PMM)

Up to 25 ASYNC lines with 1 connection per line can be configured. If additional ASYNC lines are to be configured, use Guideline 1. If HASP I/O stations are to be configured, use Guideline 3.

4. NOS/VE MTI memory Configuration (minimum MTI with 1 SMM, one PMM)

Up to 32 ASYNC lines with 1 connection per line can be configured. If additional ASYNC lines are to be configured, use Guideline 1. If HASP I/O stations are to be configured, use Guideline 3. If ASYNC printers are to be configured, use Guideline 2.

5. NOS MDI Memory Configuration (minimum MDI has 1 SMM with PMM)

Up to 45 active connections can be supported (2K bytes are used per connection). If additional connections are required, additional SMM will be needed. Note that 2 SMM boards could support up to 300 connections from a memory standpoint. However, DI processor limits may be reached at less than 300 connections.

6. NOS/VE MDI Memory Configuration (minimum MDI has SMM only)

There are no NOS/VE MDI active connection memory constraints for the committed configurations.

7. NOS or NOS/VE NDI Memory Configuration (Minimum NDI has SMM only)

There are no memory constraints with up to two X.25 trunks.

Access Procedures for 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), a problem can occur if SCL variables are referenced by commands inside the utility. This can be of particular importance when a utility is invoked from a procedure where status variables will commonly be used to control procedure flow.

The following sequence will 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 unknown 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
```

ANACD - Dump Analyzer

The version or software release level of the dump to be analyzed should be as close to that of the ANACD software as possible, otherwise the results of some subcommands may be unreliable or provide incomplete data. This occurs because many ANACD subcommands examine DI software structures which may change from one version to the next as new features are added. Subcommands such as `DISPLAY_MEMORY` or `DISPLAY_LINKED_LIST` which do not rely on DI software structures will work on any dump.

Periods are no longer allowed to terminate ANACD subcommands. Periods must be removed from the end of the subcommand lines in ANACD directives files or a parser error will result.

Now that Dump Analyzer can run on NOS/VE, long file names (up to 31 characters) are accepted as valid on subcommands issued within the utility. A warning message is issued on NOS if a long name is used on a subcommand that only the first 7 characters will be used to determine the identity of the file. This means that on NOS it is the user's responsibility to ensure that file names used within ANACD are unique in the first seven characters. The advantage is that directive files containing subcommands can utilize long name files and be used on NOS and NOS/VE without change provided that names with special characters are not used.

Flow Control

Most terminals and microcomputers which allow use of 19.2 Kbps or faster lines require the use of downline flow control since they cannot accept sustained line traffic at full data rate. Also, some terminals/computers have problems at line speeds as low as 4800/9600 bps. Some terminals/computers automatically enable flow control; for others it is a configuration or run-time option. CDCNET defaults `CHARACTER_FLOW_CONTROL` (XON/XOFF handshaking) to ON to avoid flow control related problems, since they often result in apparently hung terminals or lines. While it is unlikely that this will cause any problems for most users, some terminals or protocol-transfer utilities may need to be able to send/receive all 256 characters. Site and user prologs and procedures which specifically disable flow control should be reviewed to determine if this is necessary. CDC strongly recommends that flow control be enabled whenever possible to avoid garbled or missing data or seemingly hung terminals. Users may require instruction on terminal/computer setup. Some programs, such as full screen products, enable flow control and leave it set upon exit; others, such as PFTF when processing XMODEM protocol transfers, disable it. To check on the setting of flow control, use the `DISPLAY_TERMINAL_ATTRIBUTES` command. If flow control is set incorrectly, it can be changed by using the `CHANGE_TERMINAL_ATTRIBUTES` command.

CDCNET supports control signal flow control (sometimes referred to as "out of band" or EIA) for input data, as an option that can be specified via the `EIA_FLOW_CONTROL` (EFC) parameter on the `DEFINE_LINE` (DEFL) command in the configuration file. 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 control signal 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. If control signal flow control is used in a directly connected DTE-to-DTE null modem configuration (e.g. terminal cabled directly to LIM), the TN472 or YA306 cable must be used.

Some terminals claim to support high line speeds and flow control but in fact cannot keep up with sustained high data rate traffic. Problems resulting from data overrun can include many symptoms, such as "garbage on the screen", "terminal locked up", partial loss of function key data after the host sends an X-OFF downline, valid data written to incorrect places on the screen, etc. Operations that take a long time such as screen clear often aggravate these situations.

It should be noted that in some cases it is necessary to reset the terminal in order to correct these problems. This would typically be the case with a terminal such as a 721 where there is heavy use of downline escape sequences. The loss of portions of an escape sequence can result in a very confused terminal.

It should also be noted that problems in this area may be encountered even when line speeds are the same under CDCNET as with CCP or other networks, due to timing and output data rates.

If a user line or terminal appears to hang, it may be possible to resume normal operation by manually entering X-ON, BREAK, or BREAK followed by X-ON; if these fail to correct the problem, resetting the terminal may be required. Using a lower line speed may help determine if the problem is line speed related; if it is, use a lower line speed until the problem is resolved. Also, verify that both the terminal and CDCNET have flow control enabled and that the modem, multiplexer, port selector, local area network, etc. are not "discarding" this flow control.

There are a number of conditions which can cause a terminal not to send an X-ON after an X-OFF has been sent to the network. When this occurs, it appears as though the line is hung. Entering an X-ON from the terminal keyboard may resolve the problem. Two examples of when this situation occurs are as follows:

- A reset code is sent to the terminal. On Zenith Z19/Z29 terminals, there is a sequence that resets the terminal. If this is sent, the terminal resets itself and forgets that it has sent an X-OFF. This condition has been encountered when some TDU files were doing this type of thing.
- Entering of a Break on a 721 terminal sometimes results in the line being left in an X-OFF state.

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 be 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 insure 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.

The "emergency escape sequences" (Break/Control-A/Control-T and Break/Control-A/Control-X) do not work on some CDC 721 terminal configurations because some characters, such as Control-A, have special meaning to a CDC 721 terminal.

CDC 721 terminals with Revision 3.0 firmware have serious deficiencies with flow control. CDC recommends that these terminals with Rev 3.0 firmware not be used above 9600 bps. CDC 721 terminals with Revision 4.0 firmware also have serious problems with flow control at line speeds above 9600 bps. CDC does not advise use of a CDC 721 terminal in 132 column mode at line speeds above 9600 bps. Also, some users may see problems in 80 column mode at line speeds above 9600 bps. A ROM pack option is planned to address these problems. 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.

DI Clock Maintenance

The value of the DI date and time in MPB battery backed RAM is initialized to 01/01/86 00:00:00 when first loading an R1.1 system, or on subsequent resets of an R1.1 system in which power has been lost to the MPB.

If a DI is brought down and not reinitialized for a period exceeding 24 hours, the automatically adjusted date will be wrong. For a DI which does not contain the network master clock, this will cause a few log messages to be issued with an incorrect date until the DI can automatically synchronize its clock with the network master clock.

If the master clock is being maintained in a DI, i.e. a NOS network, and if the master clock DI is initialized after being down for a period of 24 hours, the proper date and time should be adjusted in the master clock DI using the SET_DATE_AND_TIME command. All other DIs should then be synchronized using the SYNCHRONIZE_CLOCK command.

The date and time of last DI reset is derived from the DI date and time kept in MPB RAM. After a reset to load an R1.1 system or after a reset in which power has been lost to the MPB, the date and time of last reset as displayed by the `display_system_status` command, will be incorrectly reported as 86/01/01 00:00:xx. In order to properly initialize the date and time of last reset, the DI date and time should be correctly initialized and then the DI should be reset a second time.

NPA

Attempts to reformat CDCNET 1.0 log files with NPA on CDCNET 1.1 will produce unpredictable results.

Care must be taken 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 will be skipped. Reformatting two log files separately but in the wrong order is an example of a lost data situation. Reformatting the same two log files in a single NPA reformat run would be okay, as NPA will sort out the order.

Excessive Logging

Some log messages may occur quite often and cause problems in reviewing the NPA files or in using too much disk space. Sites are encouraged to disable additional log messages as necessary via the `DEFINE_SOURCE_LOG_GROUP` and `CHANGE_SOURCE_LOG_GROUP` commands. Two such messages to consider are:

- 210 - an indication of a modem/line disconnect. Due to changes from AC10086, this message could be issued every 30 seconds for a failing modem or line. If this log message occurs frequently, the site should correct the hardware problem or disable the log message.
- 283 - may occur as a result of an ESCI reset. If the "from status" and the "to status" (`network_up` to `network_up`) are both zero, CDCNET is still operational as indicated in the log message explanation, and the log message can be ignored. However, if the status is not zero, this message may indicate a different problem and should be investigated.

When the condition has been corrected, the log message can be re-enabled.

Recommendations for Logging Configuration

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.

A NOS/VE system can be configured as a primary log recorder via the NOS/VE `ACTIVATE_NETWORK_LOG` (`ACTNL`) command with the default priority (`PRIMARY`). A backup log recorder is defined with the priority `BACKUP`.

A NOS MDI or MTI can be configured as a log recorder via the CDCNET `DEFINE_RECORDER_LOG_GROUP` (`DEFRLG`) command. The primary log recorder for a NOS MDI or 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.

The `PRIMARY` priority for NOS/VE log recorders is equivalent to the priority 1 for NOS MDI or MTI log recorders, and the `BACKUP` priority is equivalent to priority 255.

All NOS MTIs should be defined as log recorders with the default priority.

One NOS/VE system or one MDI connected to a NOS host should be defined as a primary log recorder for the network. If there are any other NOS/VE systems 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. It is recommended that only one NOS/VE system be defined as a backup log recorder per log group since different backup priorities cannot be defined in this release. Redundant logging (multiple log recorders in the network defined with the same priority) is NOT recommended since it adds overhead to the DIs generating log messages (log sources), adds overhead to the 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 will need to be obtained. The log files may be reformatted and reports generated separately for each host or 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).

CAUTION: Care must be taken when reformatting log files from different hosts to avoid loss of data. Refer to the NPA section on page 6-30.

NAM/VE Attribute Management Differences

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.

Access Path Determination - NOS Only

As described in NAM Terminal Name Generation, on page 6-33, the terminal name provided to NAM by CDCNET is generated by an algorithm that does not include the physical port number. Therefore, with CDCNET terminals it is not possible to identify the exact physical path traversed by a given user to access the system, as it is for CCP. From an operational standpoint, this means that the NVF display of user names and the associated terminal name will no longer be useful for identifying the exact physical path over which a given user is accessing the system.

Accounting Information - NOS Only

The following items describe accounting information for CDCNET:

- NAM Terminal Name Generation
- Account File Messages

NAM Terminal Name Generation

CDCNET terminal names are not defined in the NCF. CDCNET MDIs/MTIs supply NAM with a terminal name of the following form:

Tccmmnnn

where: cc = logical link coupler node number
mm = logical link MDI/MTI node number
nnn = number in the range 1..255 for uniqueness

Account File Messages

The CDCNET terminal name generation algorithm affects sites that use the ABAP message from the account file to generate port utilization statistics. Any programs that process the account file to extract this type of statistical information should be modified to use the SCTE message. (The SCTE message is generated when a user logs out.) Any programs that generate user billing based upon correlation of the terminal name field in the ABAP message with the NCF to determine the characteristics of the line also need to be modified.

The format of the new account file messages is as follows:

Terminal Accounting Messages

SCTE, C1, NAM_terminal_name.
SCTE, C2, device_type.
SCTE, C3, destination_service.
SCTE, C4, di_name_or_address.
SCTE, C5, lim,port,vvvv. (vvvv=0)
SCTE, C6, tttttrrrrrssss.
SCTE, C7, ccccc.
SCTE, C8, connect_time.

Application-Application Accounting Messages

SCAP, C1, source_service. (always blank)
SCAP, C2, destination_service.
SCAP, C3, di_name_or_address. (system ID of remote DI)
SCAP, C4, mmm,prt,vvvv. (mmm=0, prt & vvvv=0 unless X.25)
SCAP, C5, tttttrrrrrrrssssss.
SCAP, C6, ccccc.
SCAP, C7, connect_time.

where:

cccccc = Characters received
lim = Line Interface Module
mmm = LIM or mainframe channel interface
prt = Port number on the LIM
rrrrrr = Blocks/packets received
ssssss = Characters transferred
tttttt = Blocks/packets transferred
vvvv = X.25 virtual circuit number

Application/Terminal User Information

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

- Host Unavailability Processing
- Hi-Speed Micro-Mainframe File Transfers
- Terminal Recognition Problems
- User Breaks

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 %DO command.

Hi-Speed Micro-Mainframe File Transfers

Many personal/microcomputers cannot keep up with 38.4 Kbps traffic; some may even have problems at 19.2 Kbps and 9.6 Kbps. Protocol transfers via CONNECT, XMODEM, RMF, etc. should successfully detect and may be able to successfully recover from such errors, but non-protocol transfers at these speeds may be suspect.

Terminal Recognition Problems

Terminals with power supply problems, inaccurate bit clocks, or that are connected via very long cables may experience problems with auto recognition of line speed. These problems may occur with CDCNET where they have not occurred with other networks. The reason is that CDCNET auto baud detects over a much wider range of speeds than is supported by CCP and other networks. The failure is because the character waveform is distorted. Even though problems are encountered with auto recognition, the terminal may run without problems if the line is configured explicitly for the desired line speed.

If the ASYNC 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, due to the time it takes to load the ASYNC TIP dynamically. This delay can be avoided by including the command

```
LOAD_MODULE ASYNCTIP_MODULE
```

in each TDI/MTI configuration file. This does not have any negative impact on memory usage or allocation.

User Breaks

Since the User Break sequences for CDCNET differs from those of CCP, some user confusion can be expected. Once the newness wears off, the sequence of <ncc>1 for User Break 1 and <ncc>2 for User Break 2 should prove to be a benefit.

Note, however, that programs using transparent input may have "hard coded" recognition of the CCP User Break(s); FSE is an example of a program which has been "hard coded" to recognize control-T in screen mode.

CDCNET Batch Devices

The following items describe CDCNET batch devices:

- HASP Workstations
- CDC 533-1, 536-1 Asynchronous Line Printers
- Printing of the Banner Page Separator

HASP Workstations

1. CYBER 18 HASP Workstation

On the display terminal which provides the workstation operator with an interface to the system, the underscore character is mapped to a backspace character. To change the mapping so that the character is interpreted as an underscore, the following should be done:

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

The TN109 cable should be used with the HASP workstation printer.

CDC 533-1, 536-1 Asynchronous Line Printers

See the CDCNET Batch Device User Guide (60463863) for information on suggested printer settings. The TN109 cable should be used with the asynchronous line printer.

Printing of the Banner Page Separator

In order for each banner page separator to be printed across the page perforations, the "automatic skip on perforation" switch on the printer must be disabled.

Manual Errata

The following items describe manual errata for CDCNET:

- INPUT_OUTPUT_MODE Documentation
- CDCNET Secure Terminal Procedure
- HASP Workstation Configuration
- Logging Configuration Command Changes
- Log Message Changes
- Command Continuation
- Accessing CDCNET Utilities - NOS/VE Only
- Retrieving a DI Dump File - NOS/VE Only
- Terminal Class for Teletype Model 43 - NOS & NOS/VE Dual State
- MDI Error Status - NOS Only
- CCP and CDCNET Differences

INPUT_OUTPUT_MODE Documentation

The Terminal Interface Usage Manual (60463850A) incorrectly documents how the connection attribute INPUT_OUTPUT_MODE (IOM) operates. The following documentation should be used instead of the released documentation.

UNSOLICITED or U In this mode, CDCNET edits input as soon as it is received. The edited input is forwarded to the application when a forwarding character, such as ELC, is received. Output received while input is being edited is not sent until a forwarding character is received. Input received while output is active will suspend output until a forwarding character is received.

In this mode, each line of typed ahead input is edited and echoed to the terminal as it is entered.

SOLICITED or S In this mode, CDCNET edits and forwards input only when the application has solicited the next input. An application solicits input by sending a complete output message to the terminal.

When input has been solicited, the input editing and forwarding process, and the process of interrupting and resuming output, is the same as for the UNSOLICITED mode.

If the application has not solicited the next input, input is accepted by CDCNET but is not edited. No echoplexing, backspacing or cursor positioning will be seen at the terminal. User interrupts may be entered but will not be processed until the application solicits input. Output is transmitted as soon as it is received and received input does not interrupt output in progress.

In this mode, each line of typed ahead input is edited and echoed to the terminal only when it has been solicited by the application.

FULLDUPLEX or F In this mode, CDCNET processes input and output independently of each other.

Input is edited as soon as it is received. The edited input is forwarded to the application when a forwarding character, such as ELC, is received.

Output is delivered to the terminal as soon as it is received.

CDCNET Secure Terminal Procedure

Any Terminal User Procedure (TUP) whose name begins with the 'commercial at' (@) character can only be executed when specified in the DEFINE_LINE command (DEFL). It cannot be executed via a DO command. This feature is most useful for TUPs that include logins (user validation) because the procedure cannot be executed by any terminal user.

HASP Workstation Configuration

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.

Logging Configuration Command Changes

CDCNET provides a site with the capability to define subsets of DI systems within the catenet and have all the systems within a subset transmit their messages to a common log file. Such a subset of systems is referred to as a log group.

In prior releases of CDCNET, the default and only log group name allowed was CATENET and therefore all systems within the catenet transmitted their messages to the same log file.

In this release, log group names other than CATENET are allowed. The log_group parameter on the DEFINE_SOURCE_LOG_GROUP (DEFSLG) command may be used to specify a site selected name for the log group that a CDCNET system is to belong to. A NOS MDI/MTI or a NOS/VE system within the catenet must be defined to provide the log recording function for the log group. In a NOS environment, the log_group parameter on the DEFINE_RECORDER_LOG_GROUP (DEFRLG) command is used to specify the name for the log group that a CDCNET system is to provide the log recording function for. In a NOS/VE environment, the groups parameter on the ACTIVATE_NETWORK_LOG (ACTNL) command is used to specify the name for the log group that a NOS/VE system is to provide the log recording function for. The default log group name for these commands is CATENET.

The command responses for the CDCNET logging commands have changed and are as follows.

DEFINE_SOURCE_LOG_GROUP (DEFSLG)

- . Source log group defined.
- . --WARNING-- Source log group defined, no message numbers specified.
- . --ERROR-- A source log group is already defined for the system.
- . --FATAL-- Not enough memory is currently available for required table space.

CHANGE_SOURCE_LOG_GROUP (CHASLG)

- . Source log group changed.
- . --WARNING-- No message numbers specified.
- . --ERROR-- Log group <name> not defined.

CANCEL_SOURCE_LOG_GROUP (CANSLG)

- . Source log group cancelled.
- . --WARNING-- Specified source log group cancelled. Source log group <name> was not defined.
- . --WARNING-- No source log groups defined.

DEFINE_RECORDER_LOG_GROUP (DEFRLG)

- . Recorder log group is defined for coupler node <xx>.
- . --WARNING-- Recorder log group is defined for coupler node <xx>. NP Interface for the coupler node is started but the logical link is down.
- . --WARNING-- Recorder log group is defined for coupler node <xx>. NP Interface for the coupler node is not started. Start NP Interface to enable log recording.
- . --ERROR-- A recorder log group is already defined for coupler node <xx>.
- . --ERROR-- NP Interface is not defined for coupler node <xx>.
- . --ERROR-- No default coupler node is defined. A coupler node must be specified.

- . --ERROR-- Recorder log groups cannot be defined for coupler node <xx>. Not enough memory is currently available for required table space.
- . --ERROR-- Recorder log groups cannot be defined for coupler node <xx>. Unable to initialize the log recording function.

CHANGE_RECORDER_LOG_GROUP (CHARLG)

- . Recorder log group is changed for coupler node <xx>.
- . --ERROR-- Recorder log group <name> is not defined for coupler node <xx>.
- . --ERROR-- No default coupler node is defined. A coupler node must be specified.

CANCEL_RECORDER_LOG_GROUP (CANRLG)

- . Recorder log group is cancelled for coupler node <xx>.
- . --WARNING-- Specified recorder log group is cancelled for coupler node <xx>. Recorder log group <name> was not defined.
- . --WARNING-- Recorder log groups were not defined for coupler node <xx>.
- . --WARNING-- Recorder log groups were not defined for the system.
- . --ERROR-- No default coupler node is defined. A coupler node must be specified.

Log Message Changes

1. The ACTION REQUIRED sections of some log messages in the Diagnostic Message Manual (60461600) should read as follows:
 - . ID 339: If condition persists or deteriorates, replace MPB board;
 - . ID 340: If condition persists or deteriorates, replace PMM board;
 - . ID 341 and 342: If condition persists or deteriorates, replace SMM board in indicated slot. If the board is being repaired, the error log information can be used to diagnose the problem.
2. Use the EXPCLM command to obtain the latest definition of each log message. Several messages were modified or added which are not included in the diagnostic manual.

Command Continuation

CDCNET's terminal interface does not support command line continuation.

Accessing CDCNET Utilities - NOS/VE Only

To access any of the CDCNET utilities (ANACD, MANCC, NPA, ATTCF, REPCF, DEFCF, SETVL) on NOS/VE, the commands must be added to the users' command list. Enter the SCL command:

SET_COMMAND_LIST A=\$SYSTEM.CDCNET.VERSION_INDEPENDENT.COMMAND_LIBRARY

before the CDCNET utility can be initiated.

Frequent user's of the CDCNET commands should add the SETCL command to their login prolog.

NOTE: This command is incorrectly listed for ANACD on page 2-2 of the Network Analysis Manual (60461590).

Retrieving a DI Dump File - NOS/VE Only

Page 2-4 of the Network Analysis Manual (60461590) incorrectly describes the format for a DI dump file name. The file names do not start with DUMP#FULL. Also, the example of a full path for the DI dump file should not conclude with a period (.).

Terminal Class for Teletype Model 43 - NOS & NOS/VE Dual State

The manuals incorrectly indicate that the Teletype Model 43 terminal should use terminal class 5; it is a terminal class 1 terminal. Attempts to use terminal class 5 produce unusable output. This also occurs if the TERMINAL_MODEL parameter is set for a model 43.

MDI Error Status - 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.

CCP and CDCNET Differences

This section provides the following service-specific information for NOS and NOS/VE dual state users.

- . Briefly describes NOS/VE and NOS commands that manipulate CDCNET terminal attributes and connection attributes.
- . Discusses migrating to CDCNET from CCP, the communication control program that resides in a 255X communication device.

This service-specific information is based on the assumption that a NOS/VE or NOS service is accessed through CDCNET. That is, a user is connected to a

- . NOS/VE network using NAMVE/CDCNET to access a NOS/VE service, or
- . NOS network using NAM/CDCNET to access a NOS service or NOS/VE dual state service.

1. Using NOS/VE and NOS Commands to change attributes

These services provide commands to change the terminal attributes and connection attributes.

a. NOS/VE supports the following:

CYBIL procedure calls	CYBIL procedure calls can be used to manipulate CDCNET attributes. (See chapter 5 of the CYBIL File Management Usage (60464114) for descriptions of these calls.)
-----------------------	---

SCL commands	SCL command calls can be used to manipulate CDCNET attributes. (See chapter 12 of the SCL System Interface Usage (60464014) for descriptions of SCL commands that change and retrieve CDCNET attributes.)
--------------	---

b. NOS supports the following:

TRMDEF commands	Either CDCNET attributes or CCP mnemonics can be used with the TRMDEF command. These CCP mnemonics are also used with the CCP terminal definition commands.
-----------------	---

In this document, they are called terminal definition mnemonics. For example, CI is used for carriage return idle count and CN for cancel character. (See NOS Version 2 Reference Set, Volume 3, System Commands (60459680), for descriptions of this command

and the mnemonics. Also refer to chapter 4 of the NOS SRB.)

Control Bytes

In a program, use field number/field value pairs (FN/FV) with the 0010 (terminal redefinition only for NAM/CDCNET) and 0016 (terminal redefinition) control bytes to alter the characteristics of a terminal connected to the Interactive Facility (IAF) on NOS. (See chapter 12 of NOS Version 2 Reference Set, Volume 4, Program Interface (60459690), for more information.)

CTRL/CHAR/R Supervisory Message

In an application (such as the Interactive Facility (IAF) and Printer Support Utility (PSU)), field number/field value pairs (FN/FV) can be used with the CTRL/CHAR/R supervisory message to redefine the characteristics of a terminal.

The application sends this message to the Network Access Method (NAM). (See chapter 3 of Network Products, Network Access Method (NAM) Version 1, Host Application Programming Reference Manual (60499500), for more information.)

2. Migrating from CCP to CDCNET

If CCP was used to communicate with NOS and now communication is being done via CDCNET, the use of terminal characteristics may be affected in the following ways:

- . Using CDCNET attributes with the TRMDEF command
 - . Using terminal definition mnemonics with the TRMDEF command
 - . Effects of changing NOS terminal classes
 - . CDCNET mapping of field number/field value (FN/FV) pairs
- a. Using CDCNET Attributes with the TRMDEF Command

When accessing NOS through CDCNET, CDCNET terminal attributes can be specified instead of terminal definition mnemonics.

Using attributes enables a larger set of terminal characteristics to be manipulated than with terminal definition mnemonics. However, NOS conventions and TRMDEF requirements must be adhered to when attributes are specified. The following examples illustrate the differences between entering terminal attributes on the CHANGE_TERMINAL_ATTRIBUTE (CDCNET) and TRMDEF (NOS) commands.

Difference

Examples

Integer values

CDCNET accepts decimal and hexadecimal values for integers. Hexadecimal values must include a trailing radix (16).

```
%CHATA CLC=21(16)
```

The TRMDEF command requires an X before a hexadecimal value.

```
TRMDEF,CLC=X21
```

Empty or null

CDCNET and CCP represent empty strings differently.

CDCNET uses two apostrophes.

```
%CHATA EOS=''
```

The TRMDEF command uses the following format.

```
TRMDEF,EOS=.
```

The only CDCNET attributes which TRMDEF allows the empty string to be specified are EOS, CRS, LFS or FFS.

For character delimiters CDCNET uses apostrophes to delimit characters.

```
%CHATA CLC='!'
```

The TRMDEF command uses dollar signs.

```
TRMDEF,CLC=$!$
```

Sequences

CDCNET uses sequences for the following terminal attributes:

```
CARRIAGE_RETURN_SEQUENCE  
END_OUTPUT_SEQUENCE  
FORM_FEED_SEQUENCE  
LINE_FEED_SEQUENCE
```

TRMDEF allows you to enter hexadecimal values for `TERMINAL_MODEL` as well as the sequences listed above.

```
TRMDEF,EOS=X616263
```

CDCNET accepts hexadecimal values for sequences.

%CHATA EOS=(61(16) 62(16) 63(16))

In addition, CDCNET recognizes decimal and string values.

%CHATA EOS=(97 98 99)

%CHATA EOS=('a' 'b' 'c')

Lists

CDCNET uses lists for the following connection attributes:

TRANSPARENT_FORWARD_CHARACTER
TRANSPARENT_TERMINATE_CHARACTER

CDCNET recognizes strings, decimal, and hexadecimal values in lists.

%CHACA TTC=('+' '/' 'Z' '*')

%CHACA TTC=(43 40 90 42)

%CHACA TTC=(2B(16) 28(16) 5A(16) 2A(16))

The TRMDEF command allows you to separate a list of characters with slashes (/).

TRMDEF,TTC=\$+\$/(\$/\$Z\$/*\$

TRMDEF,TTC=X2B/X28/X5A/X2A

Using ASCII characters

CDCNET allows character values to be entered as decimal code, hexadecimal code, character string, mnemonic, or control character.

The TRMDEF command requires the ASCII codes represented by decimal values 1 through 31 to be entered as decimal, octal, or hexadecimal values.

TRMDEF,CLC=24

TRMDEF,CLC=30B

TRMDEF,CLC=X18

Unlike CDCNET, the TRMDEF command does not accept a character represented as a mnemonic or control character. For example, CDCNET accepts the following entries, and the TRMDEF command does not.

%CHATA CLC=CAN

%CHATA CLC='↑X', where ↑ is the <CTRL> key

b. Using Terminal Definition Mnemonics with the TRMDEF Command

If terminal definition mnemonics with the TRMDEF command are used on a CDCNET connection, the network will convert them into terminal attributes and connection attributes. However, they are not one-to-one correspondences.

1. Corresponding Terminal Attributes and Connection Attributes

Table D-1 shows which attributes CDCNET sets when terminal definition mnemonics are entered as TRMDEF parameters. Because of space considerations, the attributes listed are abbreviated.

2. TRANSPARENT Input

TRMDEF commands may contain one or more values for a DL or XL parameter. Table D-1 shows the change(s) CDCNET makes when a TRMDEF command is entered with a specified DL or XL value. If in this conversion process, CDCNET does not establish a value for TRANSPARENT_CHARACTER_MODE, TRANSPARENT_LENGTH_MODE, or TRANSPARENT_TIMEOUT_MODE, it automatically sets that connection attribute to NONE.

For example, suppose the following TRMDEF command is entered with XL set to C1 to specify the transmission length.

```
TRMDEF,XL=C1
```

In response, CDCNET sets two connection attributes for XL=C1.

```
TRANSPARENT_LENGTH_MODE=FORWARD  
TRANSPARENT_MESSAGE_LENGTH=1
```

It also sets the following connection attributes because the TRMDEF command did not specify XL=Xxx and XL=TO.

```
TRANSPARENT_CHARACTER_MODE=NONE  
TRANSPARENT_TIMEOUT_MODE=NONE
```


Table D-1. Changing CDCNET Attributes with a TRMDEF Command

Terminal Definition Mnemonics	Corresponding Terminal Attributes and Connection Attributes
AB	Ignored.
BF=0 BF=1 BF=2	PCF=ON PCF=OFF, IBS=100 PCF=OFF, IBS=200
BS=character	BC=character
B1	Ignored.
B2	Ignored.
CI=integer	CRD=integer*line speed factor
CN=character	CLC=character
CP=Y CP=N	ELP=LFS, EPP=CRS ELP=NONE, EPP=NONE
CT=character	NCC=character
DL=Xxx DL=Ccount DL=TO	TCM=T, TFC=character, TTC=character, TLM=N, TTM=N TLM=T, TML=integer, TCM=N, TTM=N TTM=T, TCM=N, TLM=N
EB	Ignored.
EL=character EL=EB EL=EL EL=CR EL=LF EL=CL EL=NO	ELC=character Ignored. Ignored. ELP=CRS ELP=LFS ELP=CRSLFS ELP=NONE
EP=Y EP=N	E=ON E=OFF
FA=Y FA=N	EPC=NUL, SBC=ON, SND=ON EPC=LF, SBC=OFF, SND=OFF

Terminal Definition Mnemonics	Corresponding Terminal Attributes and Connection Attributes
IC=Y IC=N	CFC=ON CFC=OFF
IN=BK IN=KB IN=PT IN=X IN=XK IN=XP	Ignored. IEM=N IEM=N IEM=T IEM=T IEM=T
LI=integer	LFD=integer*linespeed factor
LK=Y LK=N	SA=D SA=S
OC=Y OC=N	CFC=ON CFC=OFF
OP=DI OP=PR OP=PT	FL=OFF FL=ON Ignored.
PA=E PA=N PA=O PA=Z PA=I	P=EVEN P=NONE P=ODD P=ZERO P=NONE
PG=Y PG=N	HP=ON HP=OFF
PL=integer	PL=integer
PW=integer	PW=integer
SE=Y SE=N	CLC=NUL, EPC=NUL, SBC=ON CLC=CAN, EPC=LF, SBC=OFF
XL=Xxx XL=C1 XL=Ccount XL=TO	TCM=FT, TFC=character, TTC=character, TLM=N, TTM=N TLM=F, TML=1, TTM=N, TCM=N TLM=FE, TML=integer, TTM=N, TCM=N TTM=T, TLM=N, TCM=N

c. Effects of Changing NOS Terminal Classes

On NOS, there are three ways to change terminal class:

- . TRMDEF command with the TC terminal definition command
- . 0010 or 0016 control byte via a program
- . CTRL/CHAR/R supervisory message to NAM via an application (such as IAF or PSU)

Whenever the NOS terminal class is changed by any of these methods, CDCNET automatically changes certain attributes.

CDCNET sets the following terminal attributes and connection attributes for all terminal class changes.

. Terminal Attribute Settings

```
CANCEL_LINE_CHARACTER=CAN
CHARACTER_FLOW_CONTROL=ON
END_LINE_CHARACTER=CR
END_LINE_POSITIONING=LFS
END_PARTIAL_CHARACTER=LF
END_PARTIAL_POSITIONING=CRS
HOLD_PAGE=OFF
NETWORK_COMMAND_CHARACTER=%
PARITY=EVEN
STATUS_ACTION=SEND
```

. Connection Attribute Settings

```
BREAK_KEY_ACTION=O
PARTIAL_CHARACTER_FORWARDING=OFF
STORE_BACKSPACE_CHARACTER=OFF
STORE_NULS_DELS=OFF
TRANSPARENT_CHARACTER_MODE=TERMINATE
TRANSPARENT_FORWARD_CHARACTER=CR
TRANSPARENT_LENGTH_MODE=TERMINATE
TRANSPARENT_MESSAGE_LENGTH=2043
TRANSPARENT_TIMEOUT_MODE=NONE
```

In addition to these global effects, CDCNET changes some terminal attributes settings based on the specified terminal class. Table D-2 shows these settings for the classes that the network supports. (The network does not support terminal class 4.)

Table D-2. Selected Terminal Attribute Settings for NOS Terminal Classes 1, 2, 3, 5, 6, 7, and 8.

	1	2	3	5	6	7	8
BC	BS	BS	BS	none	BS	BS	BS
CRD*	2	0	0	1	0	0	0
CRS	CR	CR	CR	ESC G	CR	CR	CR
E	OFF	OFF	OFF	OFF	OFF	ON	OFF
FFD	Not changed for TC 1..7						999ms
FFS	6 LFs	EM/ CAN	FF	ESC R	FS	ESC[H ESC[J	ESC FF
FL	ON	OFF	OFF	OFF	OFF	ON	OFF
LFD*	1	0	0	3	3	0	0
LFS	LF	LF	LF	ESC B	0	LF	LF
PL	0	24	30	24	27	24	35
PW	72	80	80	80	74	80	74

* Millisecond (ms) value is dependent on line speed.

The remaining terminal attributes and connection attributes are not affected by terminal class changes.

. Terminal Attributes

ATTENTION_CHARACTER
BEGIN_LINE_CHARACTER
CODE_SET
END_OUTPUT_SEQUENCE
END_PAGE_ACTION
HOLD_PAGE_OVER
TERMINAL_MODEL

. Connection Attributes

ATTENTION_CHARACTER_ACTION
INPUT_BLOCK_SIZE
INPUT_EDITING_MODE
INPUT_OUTPUT_MODE
TRANSPARENT_TERMINATE_CHARACTER

d. CDCNET Mapping of Field Number/Field Value Pairs

When one of the following is used, CDCNET converts the terminal characteristics that were specified from field number/field value pairs to attribute settings.

- . IAF 0010 or 0016 control byte in a NOS program
- . CTRL/CHAR/R supervisory message that an application sends to NAM

1. Corresponding Terminal Attributes and Connection Attributes

Table D-3 shows the terminal attributes and connection attributes that the network uses when field number/field value pairs are specified in the following:

- . 0010 or 0016 control byte
- . CTRL/CHAR/R supervisory message

Because of space considerations, the attributes settings and field names are abbreviated.

2. TRANSPARENT Input

- . Converting field number/field value pairs to CDCNET attributes for TRANSPARENT input is quite complex. As a result, the following field number/field value pairs (decimal) should be sent together to ensure proper results.

56, 57, 58, 59, 60, 69, 70, and 146

CDCNET converts these field number/field value pairs into the TRANSPARENT_CHARACTER_MODE, TRANSPARENT_LENGTH_MODE, and TRANSPARENT_TIMEOUT_MODE settings as shown in figures D-1 through D-5.

Table D-3. Mapping of FN/FV Pairs to CDCNET Attributes

Decimal Field Number	Octal Field Number	Field Name	Field Value	Corresponding Terminal Attributes & Connection Attributes
25	31	BF	0 1 2	PCF=ON PCF=OFF, IBS=100 PCF=OFF, IBS=200
30	36	XBZ1	all	Ignored.
31	37	XBZ2	all	Ignored.
32	40	LK	0 1	SA=S SA=D
33	41	HD	all	Ignored.
34	42	TC	all	See section 'Effects of Changing NOS Terminal Classes'
35	43	PW	integer	PW=integer
36	44	PL	integer	PL=integer
37	45	PG	0 1	HP=OFF HP=ON
38	46	CN	character	CLC=character
39	47	BS	character	BC=character
40	50	CT	character	NCC=character
41	51	AB	all	Ignored.
42	52	B1	all	Ignored.
43	53	B2	all	Ignored.
44	54	CI	integer	CRD=integer*linespeed factor
45	55	LI	integer	LFD=integer*linespeed factor
46	56	CA	1	Ignored.

Decimal Field Number	Octal Field Number	Field Name	Field Value	Corresponding Terminal Attributes & Connection Attributes
47	57	LA	1	Ignored.
49	61	EP	0 1	E=OFF E=ON
50	62	PA	0 1 2 3 4	P=ZERO P=ODD P=EVEN P=NONE P=NONE
51	63	BR	0 1	BKA=0 BKA=1
52	64	XPT	0 1	IEM=N IEM=T
53	65	IN	all	Ignored.
54	66	OP	0 1 2	FL=OFF FL=ON Ignored.
55	67	FA	0 1	EPC=LF, SBC=OFF, SND=OFF EPC=NUL, SBC=ON, SND=ON
56	70	DL/XL	0 1	See figure D-1.
57	71	UBTCC	all	See figure D-4.
58	72	LBTCC	all	See figure D-4.
59	73	TDC	all	See figure D-2.
60	74	TTM	0 1	See figure D-5.
61	75	EL	character	ELC=character
62	76	ELO	all	Ignored.

Decimal Field Number	Octal Field Number	Field Name	Field Value	Corresponding Terminal Attributes & Connection Attributes
63	77	CPEL	0 1 2 3	ELP=NONE ELP=CRS ELP=LFS ELP=CRSLFS
64	100	EB	all	Ignored.
65	101	EBO	all	Ignored.
66	102	CPEB	all	Ignored.
67	103	IC	0 1	CFC=OFF CFC=ON
68	104	OC	0 1	CFC=OFF CFC=ON
69	105	MTIC	all	See figure D-3.
70	106	TMM	1	See figures D-1, D-4 and D-5.
71	107	CP	0 1	ELP=NONE, EPP=NONE ELP=LFS, EPP=CRS
87	127	FDLX	0 1	IOM=S IOM=F
102	146	PP	character	EOS=character
112	160	NTA	0 1	IOM=U IOM=S
146	222	STTO	0 1	See figure D-5.
147	223	CRI	integer	CRD=integer*4
148	224	LFI	integer	LFD=integer*4

- Figure D-1. Corresponding TRANSPARENT_CHARACTER_MODE Settings

```
If Transparent Input Character (56) is specified (1)
  Then if Transparent Message Mode (70) is specified as Multimessage (1)
    Then if Multimessage Transparent Input Character (69) is specified
      Then set TRANSPARENT_CHARACTER_MODE=FORWARD
    If not, set TRANSPARENT_CHARACTER_MODE=FORWARD_TERMINATE
  If not, set TRANSPARENT_CHARACTER_MODE=TERMINATE
If not, set TRANSPARENT_CHARACTER_MODE=NONE
```

- Figure D-2. Corresponding TRANSPARENT_FORWARD_CHARACTER Settings

```
If Transparent Delimiter Character (59) is specified
  Then set TRANSPARENT_FORWARD_CHARACTER=(value of 59)
  If TRANSPARENT_FORWARD_CHARACTER=CR
    If the terminal's parity is IGNORE
      Then set TRANSPARENT_FORWARD_CHARACTER=(OD(16),8D(16))
    If not, leave TRANSPARENT_FORWARD_CHARACTER=CR
  If not, leave TRANSPARENT_FORWARD_CHARACTER=(value of 59)
If not, leave TRANSPARENT_FORWARD_CHARACTER unchanged
```

- Figure D-3. Corresponding TRANSPARENT_TERMINATE_CHARACTER Settings

```
If Multimessage Transparent Input Character (69) is specified
  Then set TRANSPARENT_TERMINATE_CHARACTER=(value of 69)
  If TRANSPARENT_TERMINATE_CHARACTER=CR
    If the terminal's parity is IGNORE
      Then set TRANSPARENT_TERMINATE_CHARACTER=(OD(16),8D(16))
    If not, leave TRANSPARENT_TERMINATE_CHARACTER=CR
  If not, leave TRANSPARENT_TERMINATE_CHARACTER=(value of 69)
If not, leave TRANSPARENT_TERMINATE_CHARACTER unchanged
```

- Figure D-4. Corresponding TRANSPARENT_LENGTH_MODE Settings

```
If Upper Byte Transparent Character Count (57) is specified and not 0
or Lower Byte Transparent Character Count (58) is specified and not 0
  Then TRANSPARENT_MESSAGE_LENGTH=(value of 57 * 256) + (value of 58)
  If Transparent Message Mode (70) is specified as Multimessage (1)
    If TRANSPARENT_MESSAGE_LENGTH=1
      Then set TRANSPARENT_LENGTH_MODE=FORWARD*
    If not, set TRANSPARENT_LENGTH_MODE=FORWARD_EXACT
  If not, set TRANSPARENT_LENGTH_MODE=TERMINATE
If not, set TRANSPARENT_LENGTH_MODE=NONE
```

* CCP sets TRANSPARENT_LENGTH_MODE=FORWARD_EXACT for all lengths specified.

• Figure D-5. Corresponding TRANSPARENT_TIMEOUT_MODE Settings

```
If Transparent Timeout (60) is specified (1)
  Then set TRANSPARENT_TIMEOUT_MODE=TERMINATE
    If Transparent Message Mode (70) is specified as Multimessage (1)
      and "Sticky" Transparent Timeout (146) is specified (1)
        Then set TRANSPARENT_TIMEOUT_MODE=FORWARD
      If not, stop
  If not, set TRANSPARENT_TIMEOUT_MODE=NONE
```

Future NOS Considerations - NOS Only

1. 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 for CDCNET 1.1. Several practices you can use now to ease migration to the new format are listed below:

- a. Maintain all terminal user procedures, terminal definition procedures and DI configuration files on the same user name.
- b. 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.)

2. In a future release, the network file manager, NETFM, will no longer default to look in username NETOPS for the network directory file, NETDIR. To prepare for this change, 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. For example,

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

should become,

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

Appendix A

Feature Notes

NOTE

This appendix is in lieu of a separate Feature Notes Bulletin (FNB). No FNB is included in this release.

698 CYBER Magnetic Tape Subsystem

With this release, NOS supports the 698 CYBER Magnetic Tape Subsystem (CMTS/698). The CMTS/698 features a tape speed of 200 ips with density selections of 1600 and 6250 CPI. It requires a CYBER-180 type mainframe and a CYBER channel coupler (CCC) for each channel used to access the drives.

The maximum CMTS/698 subsystem supported by NOS consists of two channels connected to eight magnetic tape units (2x8) with each channel connected through a CCC. Therefore, with four channels for CMTS drives, a site may have sixteen units configured.

CMTS/698 runs concurrently with any other tape subsystem configured on separate channels. The user and operator interfaces that NOS provides for the CMTS/698 are consistent with those for the ATS/67X subsystem and MAGNET requires no additional resources to support CMTS/698.

Use the following EQPDECK entry to define the CMTS/698:

```
EQxxx=NT,ST=status,EQ=cntrlr,CH=ch1/ch2,UN=un,TF=CMTGE.
```

where xxx = the EST ordinal
 status = ON, OFF, or DOWN
 cntrlr = controller equipment number
 ch1/ch2 = channel number(s)
 un = unit number.

The new error messages, consistent with those of the ATS/67X subsystem are documented in the revised NOS V2 Operations Handbook (60459310H).

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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 2.5.1 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

