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Standard

NETWORK OPERATIONS SYSTEM

STATION DETAIL SERVER

DNC*-50 SYSTEM DATA

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1. INTRODUCTION

1.01 The Station Detail Server (SDS) is a member of the Business Network Management (BNM) group of products. The station detail server is a software feature package operating in a DNC-50 environment to interface with DMS* nodes to collect station message detail recording (SMDR) information. Refer to 450-1011-100 for a general description of the DNC-50.

1.02 The major function of the station detail server system is to produce SMDR reports.

1.03 This Northern Telecom practice (NTP) contains engineering information on the station detail server using the Dynamic Network Control system, DNC-50 operating with the software release NSR28.

1.04 Further Reading. NT supplies the following documents that fully describe provisioning and packaging.

- **Advance Provisioning Information (API).** Describes how to calculate the quantities and types of SRUs required depending on data collection volumes and other information.
- **Planning Letter(s).** Describe (among other things) the feature packages into which the software is bundled.

1.05 Structure Of This Publication. This publication provides information for engineering groups, as a source for the design, configuration, and operating requirements of a station detail server system. The publication is divided into the following chapters:

Introduction: Contains a brief description of BNM, and a summary of the contents of the publication.

System Identification: Shows how to identify the software release from the opening display.

System Constraints: Identifies the system limitations.

Compatibility: Lists the compatibility between station detail server and DMS nodes.

Test Equipment: Lists the main test equipment together with suggested usage.

Abbreviations: Lists the abbreviations used in this publication.

CHANGE HISTORY

1.06 This section lists the important changes that affect this publication. They are arranged by network software releases (NSR) in a descending order starting with the current release.

NSR28-30

1.07 The NTP was reissued to update general information, and is applicable to both NSR28 and NSR30. Information on packaging and provisioning has been removed due to its duplication with the API and Planning Letter.

NSR28

1.08 The following changes to the station detail server were made by NSR28:

- new feature on DNC performance monitoring
- ability to process SMDR data from non-DMS-100 switches
- number of simultaneous SMDR spooling ports increased to 32

NSR27

1.09 The following changes to the station detail server were made by NSR27:

- a new feature on disk utilization and monitor
- an increase to the SMDR collection capacity: up to 4M records per day
- an increase to the SMDR storage capacity, achieved by chaining 350Mbyte disks, to a total of over 11M records

1.10 The chapter on software characteristics has been removed because the measurements listed are no longer valid. Values for NSR27 are not available at this time.

* DMS is a trademark of Northern Telecom.

2. SYSTEM IDENTIFICATION

2.01 The opening display for the NSR28 release of the station detail server application is shown in Fig. 2-1. It confirms that you are logging on to a DNC-50 by the welcome statement. Beneath this statement is the application identifier and the software release of the operating system which the DNC-50 is running. The information on the display has the following meaning:

- BUSINESS NETWORK MANAGEMENT is the application system
- Base Release is the DVS system software release, for this version of BNM, it is 3.01
- BNM Release is the software release for the DNC-50 and the BNM application, for this version it is NSR28.

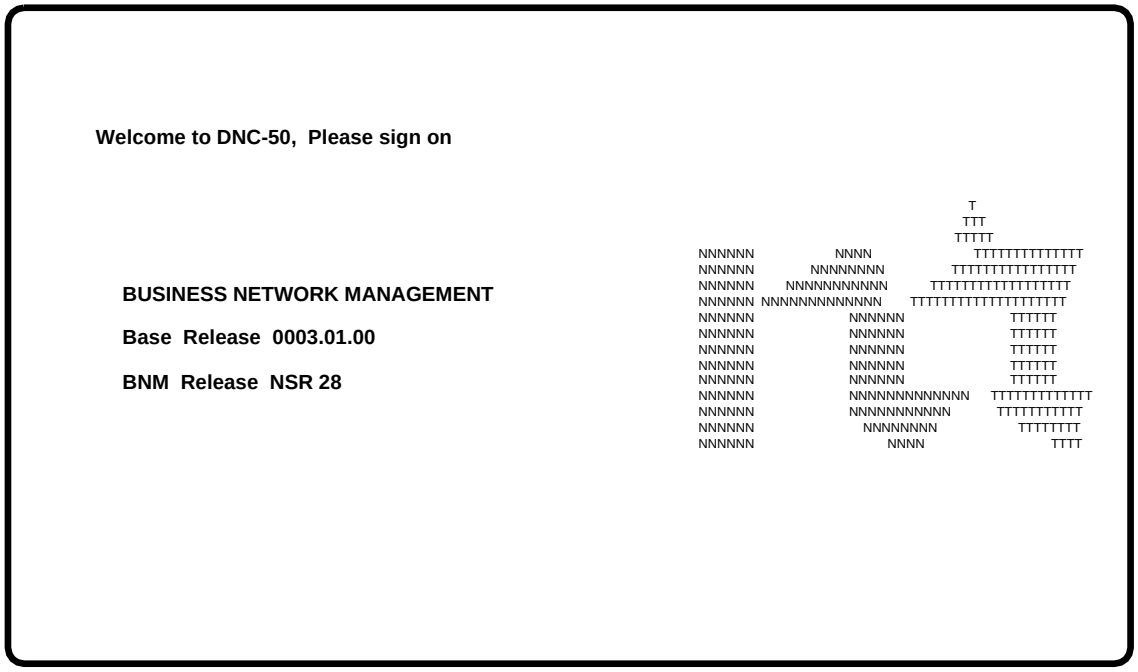

Fig. 2-1
Opening Display For The Station Detail Server Application

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3. INIT FILES DATAFILL FOR BNM

3.01 Init files together with SDM files contain the operating parameters for the system. These parameters are datafilled during the installation of a new system, or the installation of new hardware or software. As a general rule, these parameters are not changed during the life of a software release, but there are occasions when the telco is required to change some parameters. Changes in SDM tables, are made using the table editor, which is described in Chapter 4. Changes to init files, on the other hand, requires the telco to use the HELIX command interpreter (CI) for accessing a file and then making changes in the file.

3.02 This chapter does not identify the different init files, it only describes a procedure for accessing an init file for changing

Accessing An Init File

3.03 All init files are changed from the HELIX CI option. The procedure for accessing this option is as follows:

Caution: Do not make changes to an init file unless you are familiar with the HELIX CI , and the construction of init files.

(1) At the BNM main menu, select the System Administration Services menu option.
==> The system responds by displaying the options available to the user.

(2) Select the SAS Utilities option.
==> The system responds by displaying a new set of options.

(3) Select the Helix Command Interpreter option.
==> The system responds by displaying the Helix options, as shown in Fig. 3-1.

(4) At the prompt (>), input ED filename, where filename is the name of the file you wish to change.
==> The system will respond by displaying the required file.

(5) Make the changes to the file as required, then save the file by the following keystrokes to save and exit the file:
M4000 series terminal: RETURN ***QSE***
ASCII terminal: TAB ***QSE***
==> The system responds by displaying the SAS Utilities display.

(6) To exit the file without saving any changes, input the following keystrokes to exit the file:
M4000 series terminal: RETURN ***QE***
ASCII terminal: TAB ***QE***
==> The system responds by displaying the SAS Utilities display.

3.04 After changing any Init file, courtesy down, and return to service, the PRU that is affected by the change.

Note: The PRU that has to be courtesied down and returned to service, may not necessarily be the PRU that was changed.

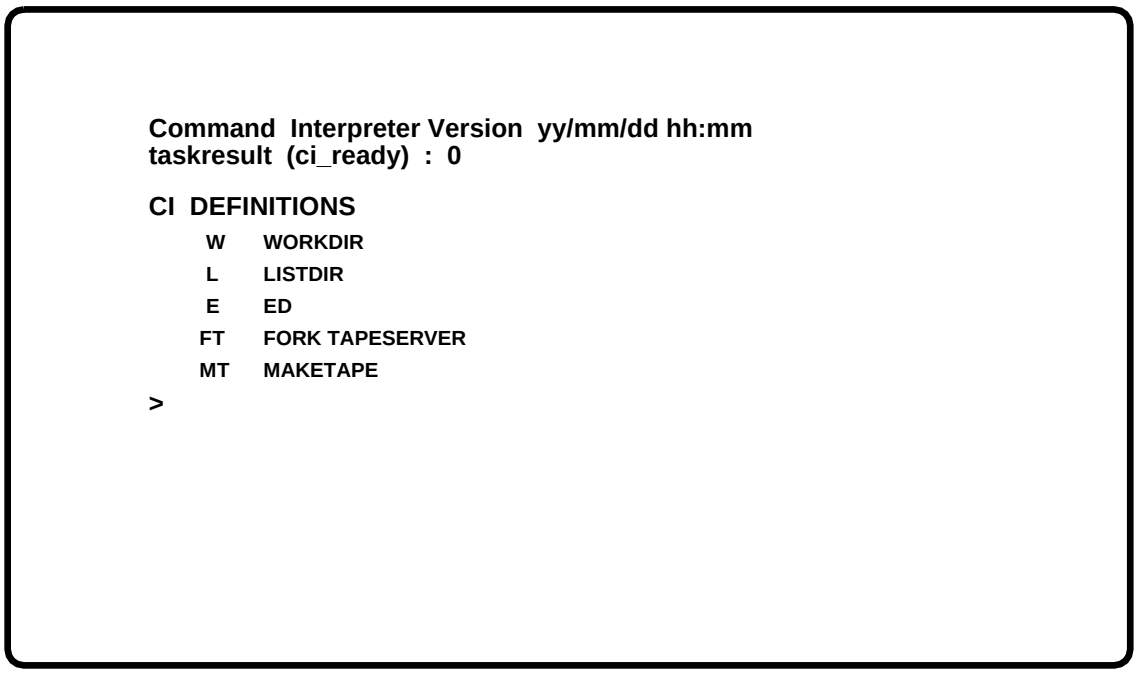

Fig. 3-1
An Example Of A Helix Command Interpreter Display

File Manager

3.05 This init file, identified by the file name :LOCAL:PRU:NOS:B:FA:FAINIT.TEXT, contains seven parameters, six of these are of interest to the telco, the other is datafilled by NT at installation time. This file also contains 16 parameters that are datafilled before installation, and must not be changed. Table 3-B lists the telco modifiable parameters.

Table 3-A
FILE MANAGER PARAMETERS

Parameter	Range	Default	Description
SMDR_server	between 2 and 9 characters, and must include a leading colon.	:LOCAL	This parameter is the name of the file server for the storage and processing of SMDR feature data.
SMDR	0 to 50	2	SMDR is the only valid parameter for the DNC-50, it allows the telco to selectively choose the retention period of SMDR records. The range is in days, not including the current day.

SMDR Key Manager

3.06 This init file, identified by the path and file name :LOCAL:PRU:NOS:B:KM:KMINIT.TEXT, contains seven parameters, only two of these are of interest to the telco, the remainder are datafilled by NT at installation time. Table 3-C lists the telco modifiable parameters.

Table 3-B
SMDR KEY MANAGER PARAMETERS

Parameter	Range	Default	Description
FILESERVER	between 2 and 9 characters, and must include a leading colon		This parameter is the name of the file server that stores the temporary files used in the sort routine.
VERSION	0 to 99		This parameter is the BCS release of the DMS-100 software that is in use at the DMS nodes.

DNC Connection Manager

3.07 This init file, identified by the path and file name :LOCAL:PRU:NOS:B:NK:NKINIT.TEXT, contains 24 parameters, only 3 of these are of interest to the telco, the remainder are datafilled by NT at installation time. Table 3-D lists the telco modifiable parameters.

Table 3-C
DNC CONNECTION MANAGER PARAMETERS

Parameter	Range	Default	Description
Max_In_Sessions		25	This parameter determines the maximum number of incoming sessions to be supported by the network connection manager at any one time. This number should be the sum of the RO_cnm_inagents in the ROINIT file for each CS PRU configured. This parameter affects the amount of memory required for the NK PRU.
Max_Out_Sessions		25	This parameter determines the maximum number of outgoing sessions to be supported by the network connection manager at any one time. This number should be the sum of the RO_cnm_outagents in the ROINIT file for each CS PRU configured. This parameter affects the amount of memory required for the NK PRU.
Loc_arbiter	0 and 1	0	This parameter is a flag that determines whether the arbiter is implemented. When set to 0 the arbiter is not used, which implies that there is only one CS PRU. This parameter is set to 1 when there are more than one CS PRUs in the installation.

Report Generator

3.08 This init file, identified by the path and file name :LOCAL:PRU:NOS:B:RG:RGINIT.TEXT, contains eight parameters, only three of these are of interest to the telco, the remainder are datafilled by NT at installation time. Table 3-E lists the telco modifiable parameters.

Table 3-D
REPORT GENERATOR PARAMETERS

Parameter	Range	Default	Description
ERRORCH OVERFLOWCH UNAVAILABLECH	Any alpha-numeric character	+ - 	These parameters allow the telco to choose the character that will represent errors in reports. The types of errors that can be represented are described in the comments for the init file.

SMDR Data Collector

3.09 This init file, identified by the path and file name :LOCAL:PRU:NOS:B:SM:DCSMDATA.TEXT, contains 17 parameters, only three of these are of interest to the telco, the remainder are datafilled by NT at installation time. Table 3-F lists the telco modifiable parameters.

Table 3-E
SMDR DATA COLLECTOR PARAMETERS

Parameter	Range	Default	Description
customer	1 to 16 characters		This parameter defines the customer.
bcs_number	0 to 99		This parameter is the BCS release of the DMS-100 software that is in use at the DMS nodes.
chgDMSfstatus	TRUE or FALSE	FALSE	This parameter is a flag for the DMS node file status. If set to FALSE, the SMDR data collector will not change the DMS file status of a DMS SMDR file which has been successfully collected on the DNC-500.

Save And Restore

3.10 This init file, identified by the path and file name :LOCAL:PRU:NOS:B:PR:PROINIT, contains the profiles for the databases. The only reason for the telco to access this file is to add or delete database paths for the save and restore directories at the bottom of the file. The addition of directories must not exceed 64.

3.11 Any changes made to this file must be made in the same format as other similar entries. The database supervisor init file must also be changed to agree with the changes made in this file.

BNM Tables

3.12 This init file, identified by the path and file name :LOCAL:PRU:NOS:B:UN:UNINIT.TEXT, contains 24 parameters, 6 of these are of interest to the telco, the remaining three are datafilled by NT at installation time. Table 3-G lists the telco modifiable parameters.

Table 3-F
BNM TABLES PARAMETERS

Parameter	Range	Default	Description
Node_Limit		10	This parameter limits the number of nodes that may be added to the Node table.
Mask_Edit_Enable	TRUE or FALSE	FALSE	If this parameter is TRUE the mask table can be edited.
Partition_Enable	TRUE or FALSE	FALSE	
Merge_Enable	TRUE or FALSE	FALSE	
PBX_ALLOWED	TRUE or FALSE	FALSE	
SMDR_ALLOWED	TRUE or FALSE	FALSE	

Tape Generation

3.13 This init file, identified by the path and file name :LOCAL:PRU:NOS:B:UN:UNINIT.TEXT, contains 10 parameters, 6 of these are of interest to the telco, the remaining three are datafilled by NT at installation time. Table 3-H lists the telco modifiable parameters.

Table 3-G
TAPE GENERATION PARAMETERS

Parameter	Range	Default	Description
append	true or false	false	This parameter determines whether the data is appended to an existing tape string. If set to true it is appended.
mask	true or false	false	This parameter enables the number string to be masked. If true, the string is masked.
maskquit	true or false	true	This parameter is a flag to verify that masking was completed. If true, tape generation is terminated if the numbers could not be masked. If false, tape generation is not terminated if masking failed.
encode	true or false	false	This parameter is a flag that determines whether data is to be encoded to ASCII. If set to true, data is coded to ASCII. If set to false, data is encoded in EBCDIC.
overflow	true or false	false	This parameter is a flag that informs whether the data will overflow to another tape. If false the data will be contained on one tape.
liu			This parameter identifies the LIU port that will be used for the tape handler. It is a number consisting of the unit type and the configuration type.

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4. SDM DATAFILL FOR BNM

SERVICE DATA MANAGER FILES

4.01 Service data manager (SDM) tables are files that contain data in list form. Each table consists of two files, the data dictionary file, and the data file. The data dictionary contains the definition of the record structure, and information regarding the access rights of various users and user groups. The data file consists of a series of records, each structured according to the definition in the data dictionary file.

4.02 Access to SDM tables is through two screens: the list of tables screen and the table-editing screen. An SDM table can only be modified from the table-editing screen, a subset of the list of tables screen.

4.03 An enhancement to multi-node spooling, introduced in NSR26, provides per customer LAN interface unit (LIU) port configuration by reading async passthru initialization data from service data manager (SDM) tables instead of from INIT files that were used prior to NSR26.

Service Data For Data Spooling

4.04 Static and dynamic service data for data spooling is contained in the three SDM tables, DS CONFIG-NS, DS DELIM-NS, and DS PORTS-UD. The names of these SDM tables are contained in the following BNM data spooling tables.

- ***Table BNMDS-NS*** contains the following SMD table names for NT static service data:
  DS CONFIG-NS
  DS DELIM-NS
  The data fill for these two SMD tables for BNM is contained in Tables 4-A and 4-B.
- ***Table BNMDS-UD*** contains the following SDM table name for NT dynamic service data:
  DS PORTS-UD
  The data fill for this SMD table is contained in Table 4-C.

Table 4-A
DATA SPOOLING CONFIGURATION DATA TABLE

Table Name	Parameter	Value	Description
DS CONFIG-NS	APIO Flow Control	TRUE	This flag controls the APIO flow control. Data spooling requires this parameter to be true.
DS CONFIG-NS	XMIT Len	512	Is the number of bytes in a packet transmitted by data spooling.
DS CONFIG-NS	RCV Len	30	Is the number of bytes in a packet received by data spooling.
DS CONFIG-NS	Timeout	1000	Is the number of seconds delay between packets for data spooling.
DS CONFIG-NS	TS Log	FALSE	This flag enables TS Log error messages. Data spooling requires this parameter to be false.

Table 4-B
DATA SPOOLING DELIMITER DATA TABLE

Table Name	Parameter	Value	Description
DS DELIM-NS	Delimiter	27	Is an integer providing the ordinal value of the ASCII character used as delimiter indicating when to forward a packet. Data spooling uses the <ESC> (27) character as a delimiter.

Table 4-C
DATA SPOOLING PORT DATA TABLE

Table Name	Parameter	Value	Description
DS PORTS-UD	Tuple ID	Between 1 and 10	Is the unique identifier for the synchronous port, it is configured by the customer.
DS PORTS-UD	Port Address	cc/ss/ll/pp	Identifies the AP port being defined, where: cc is the cabinet number, ss is the slot number, ll is the line number, and pp is the port number.
DS PORTS-UD	Line Flow Control	XON/XOFF	Defines the line flow control for the communications link. It is XON/XOFF for data spooling.
DS PORTS -UD	Line Duplex	FULL	Defines the transmitting mode of the communications link.

Table Continued ----------

Table 4-C Continued
DATA SPOOLING PORT DATA TABLE

Table Name	Parameter	Value	Description
DS PORTS-UD	Baud Rate	50 thru 19200	Determines the baud rate for the port. This parameter is configured by the customer.
DS PORTS-UD	Auto Echo	FALSE	Is the selection for auto echo of characters back to the remote device. Data spooling does not use auto echoing.
DS PORTS-UD	Stop Bits	1	Is the number of stop bits added to each transmitted byte. Data spooling requires only one stop bit.
DS PORTS-UD	Parity	NONE	Is the type of character parity in use. Data spooling uses no parity.
DS PORTS-UD	Char Size	8	Is the number of bits used for each character. Data spooling uses eight bits.

DISK UTILIZATION REPORT AND MONITOR

4.05 This feature allows the user to use the SDM table editor to define disk utilization levels for:

- SMDR data collection (SM)

4.06 Once the levels are set, the user can monitor their disk consumption at pre-determined time intervals. Disk operational measurements (OMs) are generated that contain records of the number of data files, and their total volume. If the disk consumption exceeds a pre-defined threshold, alarms will be generated or a write protect will be applied to the data directories to prevent additional OMs from being written to the data files.

4.07 The parameters for the two tables associated with this feature are described in Table 4-D.

Table 4-D
SERVICE DATA PARAMETERS

Table Name	Parameter	Range	Default	Description
DMOP	Tuple_ID	up to 25 alpha-numeric characters		Is the tuple (or row) identifier, it is the first column in the table.
	Feature	1 to 9 alpha-numeric characters		Identification of the type of directories to be monitored, as defined in table DMUDF. SA and SM are currently defined. 5M is the only directory available with a DNC-50.
	Customer	0 to 16 alpha-numeric characters		Identification of the customers to be monitored, as defined in table DMUDF.
	Dir_Al_Size	-1, 6 to 32767	-1	Alarm threshold for directory size, in KBytes.
	Dir_WP_size	-1, 9 to 32767	-1	Write protect threshold for directory size, in KBytes.
	Num_File_Al	-1, 6 to 32767	-1	Alarm threshold value for the number of files.
	Disk_OM	YES or NO	NO	OM acquisition flag (true or false).
	Mon_Freq	1 to 720	1	Monitoring frequency threshold.
DMUDF	Tuple_ID	up to 25 alpha-numeric characters		Is the tuple (or row) identifier, it is the first column in the table.
DMUDF	Feature	1 to 9 alpha-numeric characters	Nil Stream	User defined feature name.
	pathname	1 to 80 alpha-numeric characters	Nil Stream	Directory pathname of the directory to be monitored.

COMMUNICATIONS SERVICE

4.08 Commencing with NSR28, the communications service (CS) PRU datafill is contained in SDM tables. Prior to NSR28 these tables were called CS init files.

4.09 Four SDM tables are used by the CS PRU, they are:

- **CSENG** This table contains parameters set by NT prior to installation. Because these parameters are not to be changed by telco or customer, details of this table are not given in this publication.
- **CSINIT** This table contains the initializing parameters, and the links to other SDM tables. Parameters in this tables may be changed after installation.
- **NOAPs** This table is renamed to SSETS, it contains information for the applications supported by the CS PRU (for instance data collection).
- **ADDR** This table provides a mapping between logical application addresses and the corresponding X.25 addresses and attributes.

Table CSENG

4.10 The parameters associated with table CSENG are shown in Table 4-E.

Table 4-E
PARAMETERS FOR TABLE CSENG

Parameter	Value	Default	Description
Object Index			CS PRU object index. There may be a number of CS PRUs, each with a unique object index, that must have a tuple in this table.
NOAPS		SSETS	Name assigned to the NOAPS table.
ADDR		ADDR	Name assigned to the ADDR table.
Sessions	1 to 128	8	Total number of sessions.
Inbound	1 to 128	4	Number of inbound sessions reserved.
Arbiter	YES or NO	YES	Decision as to whether the arbiter is required.
RTS Name			The name that RTS has registered with NS.
Reg_Type	LAN or CAMPUS	LAN	The register type.

4.11 Notes for Table 4-E.

- The Sessions field is set to reflect the total number of sessions required. The total number is the sum of the inbound and outbound sessions.
- The Inbound field indicates the number of sessions reserved for inbound calls only.
- For installations with a single CS, the arbiter is not used. In addition the RTS name must be **NOS**.
- For installations with multiple CS, the arbiter is used, and the RTS name is not used.
- SDS is not used in a CAMPUS configuration, therefore Reg_Type must be set to LAN.

Calculating Number Of Sessions

4.12 The number of sessions (inbound and outbound) are calculated as follows:

Inbound:

Inbound = 2 + (number of switches)

Outbound:

Outbound = trans + SMDR

Where:

- trans, add 1 if a transaction session is used
- SMDR, add 1 if an SMDR session is used

The total number of outbound sessions is the sum of the outbound times the number of switches.

Table NOAPS

4.13 The parameters for table NOAPS (renamed SSETS) are shown in Table 4-F.

Table 4-F
PARAMETERS FOR TABLE NOAPS

Parameter	Value	Default	Description
Profile	0 to 99		Profile ID for this application.
ApplName			Name that the application is registered with NS.
Definite	YES or NO	NO	Definite length encode decision.
SSETS			HELIX path for SSETS file.

4.14 The actual values used as parameters, depend on the feature sets installed. Examples of parameter sets for this table are:

Profile	ApplName	Definite	SSETS
0	BNM_NKAM	YES	BNMTSSET
1	BNM_NKAM	YES	BNMBSSET

Table ADDR **4.15** The parameters for table ADDR are shown in Table 4-G.

Table 4-G
PARAMETERS FOR TABLE ADDR

Parameter	Value	Default	Description
Address			Application address. An asterisk means that the default address is used in this tuple.
Subnet			X.25 Gateway name. An asterisk means that the Subnet name is the same as the application address.
NSAP			X.25 NSAP address. An asterisk means that the NSAP is the same as the application address.
CUG	0 to 99	0	X.25 closed user group. The default is 0, meaning that there is no closed user group used.
RC	YES or NO	NO	X.25 reverse charging decision. When set to YES, calls to that address have origated reverse charges.
CUD			X.25 Call User Data.

5. SYSTEM CONSTRAINTS

5.01 Table 5-A lists the maximum capacity for a DNC-50 using the SDS application.

Table 5-A
NSR26 SYSTEM CAPACITY

Parameter	Capacity
DMS nodes for SMDR collection	13
Non-DMS nodes used for SMDR data collection	30, with a maximum of 21 conversion processes running concurrently (due to a single user DVIX resource restriction)
Line transmission speed (asychronous)	19.2Kbps
Line transmission speed (X.25)	56Kbps
Rate of SMDR collection per day (DMS nodes)	4,000,000
Rate of SMDR collection per day (non-DMS nodes)	750,000
SMDR customers per system	64
SMDR Storage Capacity	11,000,000 + records

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6. COMPATIBILITY

NSR30

6.01 An SDS with NSR30 can communicate with a switch having BCS26 through BCS30 software.

NSR28

6.02 Software for the DMS nodes, connected to the associated station detail server, is developed as batch change supplements (BCSs).

6.03 The station detail server NSR28 software release is compatible with the same release of BCS software. This means that NSR28 is compatible with BCS28. The station detail server is also compatible with one forward release of BCS and two backward releases of BCS. The compatibility can be summarized as: NSR28 is compatible with BCS26 through BCS29.

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7. TEST EQUIPMENT

7.01 A DNC-50 installer or NT field representative will find the equipment listed in Table 7-A useful for installation testing or problem diagnosis.

Table 7-A
TEST EQUIPMENT LIST

EQUIPMENT	PURPOSE
Protocol analyzer	Used to diagnose DMS node to DNC-50 communications problems.
Break-out box	Used to diagnose suspected problems between RRUs (i.e., the LIU) and external devices (such as printers and modems).
ASCII (VT100 or equivalent) terminal and a suitable RS-232C cable	Monitors SRUs (primary processor and applications processors) for system messages and error tracebacks.
Supply of streaming tapes and 9 track magnetic tapes	Used to capture data from the DNC-50 hard disk. This data (such as feature data collected from a DMS node) is used for later analysis by NT personnel when searching for a suspected problem.
Dialup modem	Used with an ASCII terminal and RS-232C cable to allow NT personnel to have mainframe computer access for such things as electronic mail, program library, and problem report database access.

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8. ABBREVIATIONS AND DEFINITIONS

8.01 The following abbreviations are used in this Practice:

APIO	ASCII Programmed Input/Output
ASCII	American Standard Code for Information Interchange
BCS	Batch Change Supplement: the name given to the software release of the DMS-100
BNM	Business Network Management: a DNC application for business customers of MDC networks
DMS	Digital Multiplex System: a line of Northern Telecom switching products
DNC	Dynamic Network Control System: a line of Northern Telecom distributed processor computing systems
DPAC	Datapac: an X.25 packet-switched data network
DVS	Data Voice System
IOC	Input-Output Controller: a component of a DMS switch
LAN	Local Area Network
LIU	LAN Interface Unit: a device that provides communication ports for DNC systems
MDC	Meridian Digital Centrex: a DMS feature that provides customers with their own private switching functions
NSR	Network Software Release: the name given to the software release of the BNM application
NT	Northern Telecom
OM	Operational Measurements
PEC	Product Equipment Code
PRU	Program Replaceable Unit
SASI	Shugart Associated Standard Interface
SCSI	Small Computing Systems Interface
SDM	Service Data Manager
SDS	Station Detail Server: a DNC/BNM application that provides SMDR to customer premises
SMDR	Station Message Detail Recording: a feature that provides call detail records produced by a DMS node
SRU	Shared Resource Unit: a modular component of DNC hardware

1X89AA	The type of circuit card used on a DMS for X.25 communications links