CS 2000 Core Manager Basics

Functional description

The Communication Server 2000 Core Manager manages the XA-Core and the subtending TDM components of the Communication Server 2000.

The CS 2000 Core Manager resides on the SuperNode Data Manager (SDM) platform and provides operations, administration, maintenance, and provisioning (OAM&P) functionality.

The CS 2000 Core Manager is fault-tolerant, and connects to the operating company network through an Ethernet connection (up to 10 Mbps) to the company operations intranet. The CS 2000 Core Manager also uses the Distributed Computing Environment (DCE) to provide a secure OAM&P applications platform.

Note 1: DCE and DCE applications are manufacturer-discontinued (MD) in CS2E0090.

Note 2: The SuperNode Data Manager (SDM) is a fault-tolerant UNIX-based processing platform that uses Motorola technology, and runs operations, administration, maintenance, and provisioning (OAM&P) software applications. It is a high-performance computing platform connected to the operating company's DMS switch.

What's new in CS 2000 Core Manager in SN09

Features changes

The following feature-related changes have been made in the documentation:

- The OMDD enhancements and robustness feature required changes in the OMDD overview.
- The Removal of DCE from installation on AIX feature required the addition of notes to appropriate DCE-related descriptions.

Other changes

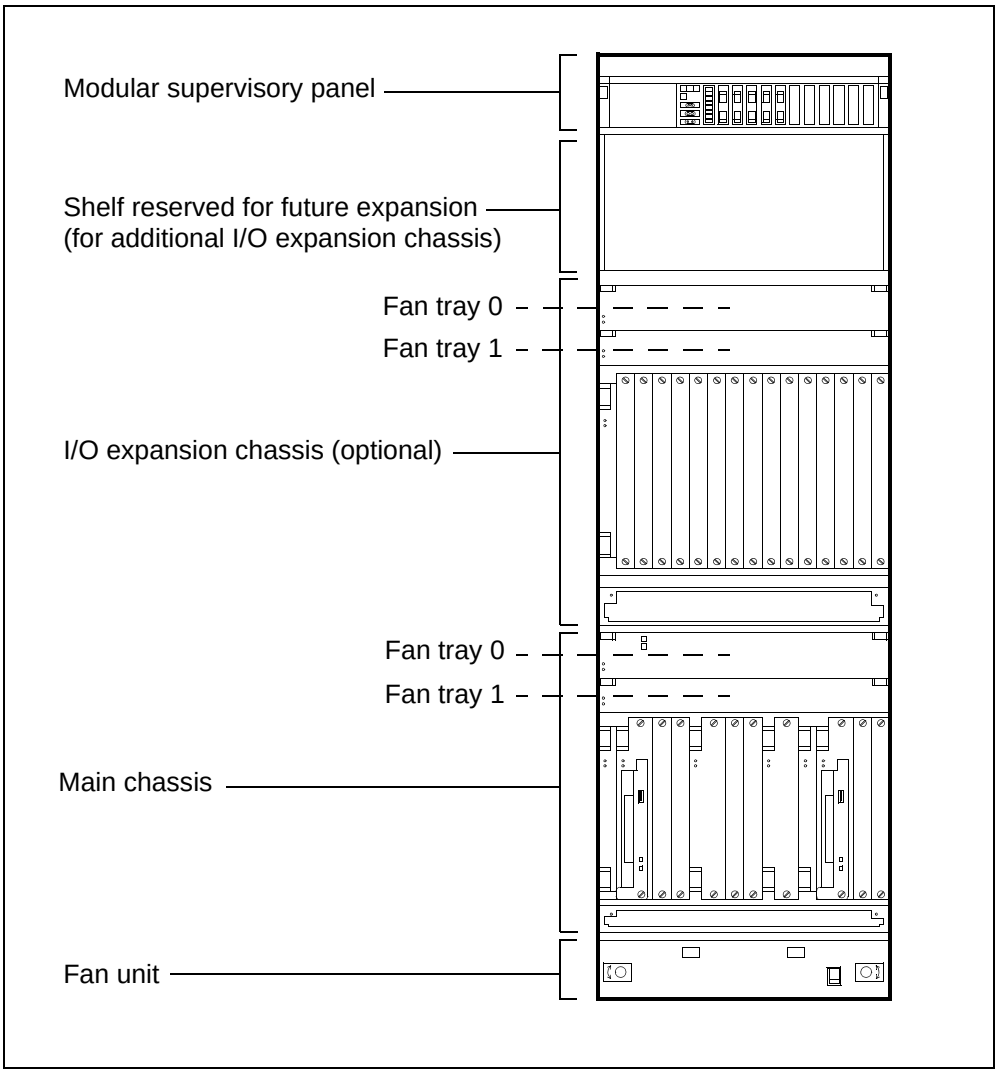
There are no other changes in this release.

Hardware overview

Cabinet

The CS 2000 Core Manager uses the Nortel C28 Model B (C28B) Streamlined cabinet. The cabinet contains a modular supervisory panel (MSP), a shelf reserved for future expansion, an optional input/output (I/O) expansion chassis, a main chassis, and a fan unit. System modules are located at the front of the main chassis and the I/O expansion chassis. The following figure shows a front view of the cabinet.

Front view of the C28B cabinet



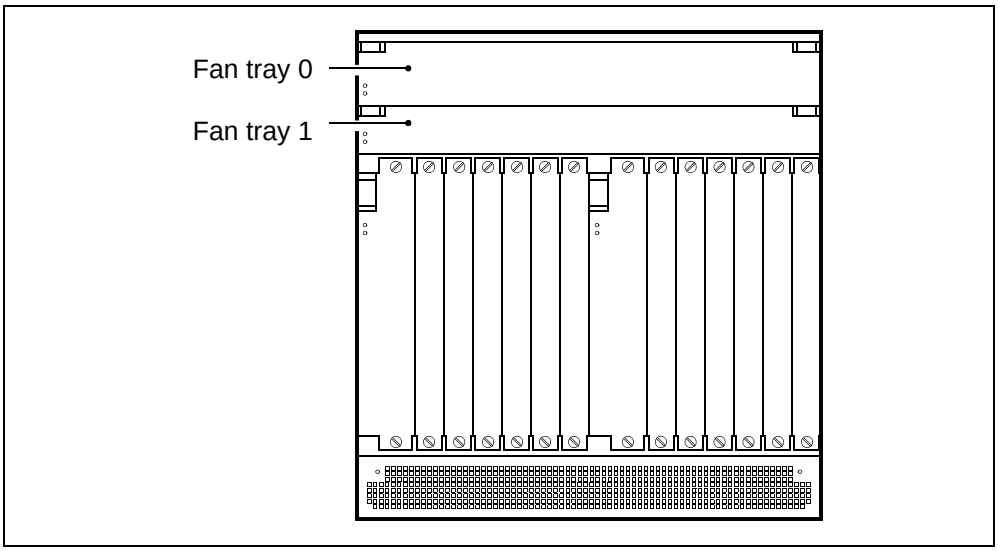
Modular supervisory panel

The modular supervisory panel (MSP) provides power and alarm monitoring for the C28B cabinet. The A and B battery feeds (-48V dc) supply power to the fault-tolerant system platform. Each feed is supplied from a separate breaker in the MSP into interconnect modules (ICMs) in the main and I/O expansion chassis.

Front-mounted I/O expansion chassis

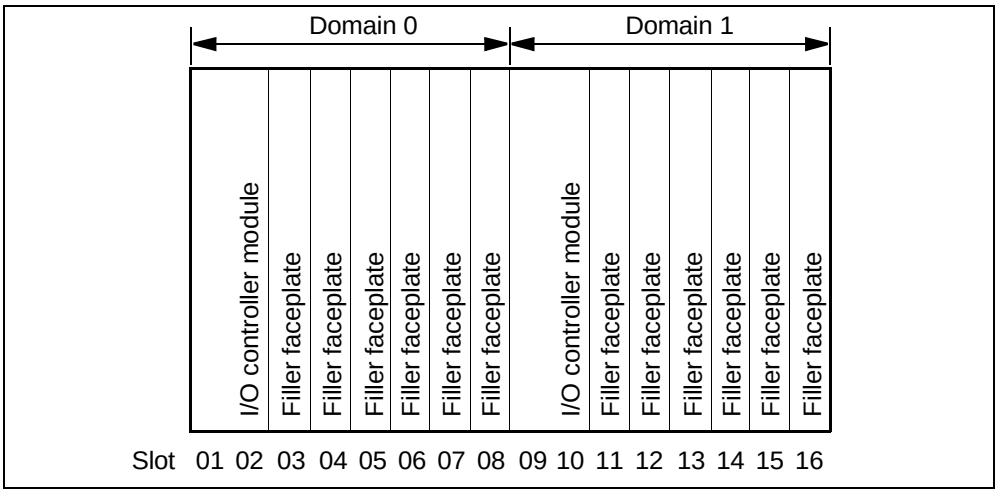
The I/O expansion chassis is for optional system modules. The chassis has two removable fan trays (NTRX50KD and NTRX50FF) that provide horizontal (front-to-rear) cooling to the chassis. Each fan try has three fans and are powered by separate battery feeds to ensure uninterrupted cooling during fan tray servicing. The following figure shows a front view of the I/O expansion chassis.

Front view of the I/O expansion chassis



Provisionable system modules in the I/O expansion chassis are not restricted to specific slot numbers. The I/O controller module mounts in any two slots, providing the slot numbers correspond in each domain (0 and 1). Personality modules are not required for the I/O controller modules. The following figure identifies the slot numbers in domains 0 and 1, and the I/O controller modules.

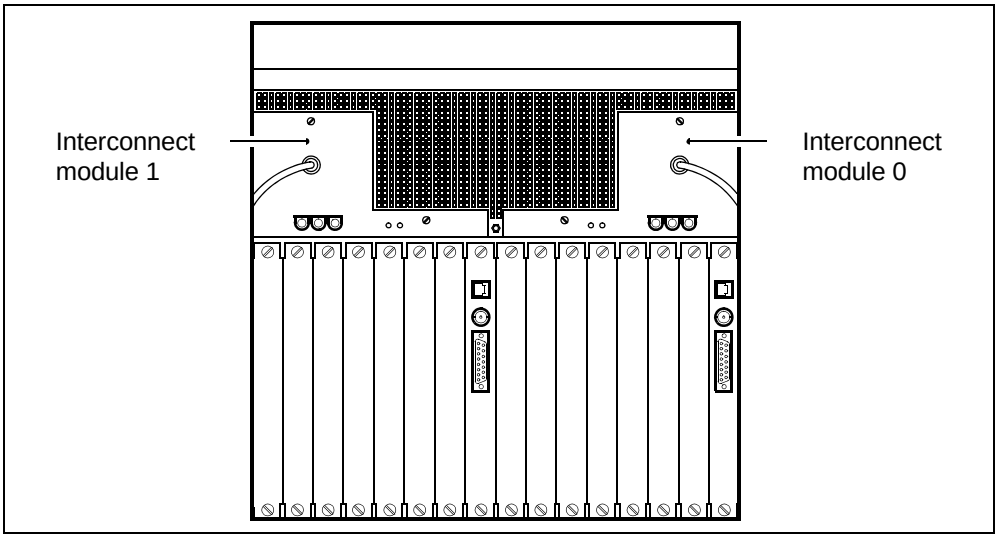
Front view of the I/O expansion chassis by slot number



Rear-mounted I/O expansion chassis

The rear of the I/O expansion chassis contains two interconnect modules (ICM)[1] that supply power to the CS 2000 Core Manager through separate battery feeds. The following figure shows the rear view of the I/O expansion chassis.

Rear view of the I/O expansion chassis

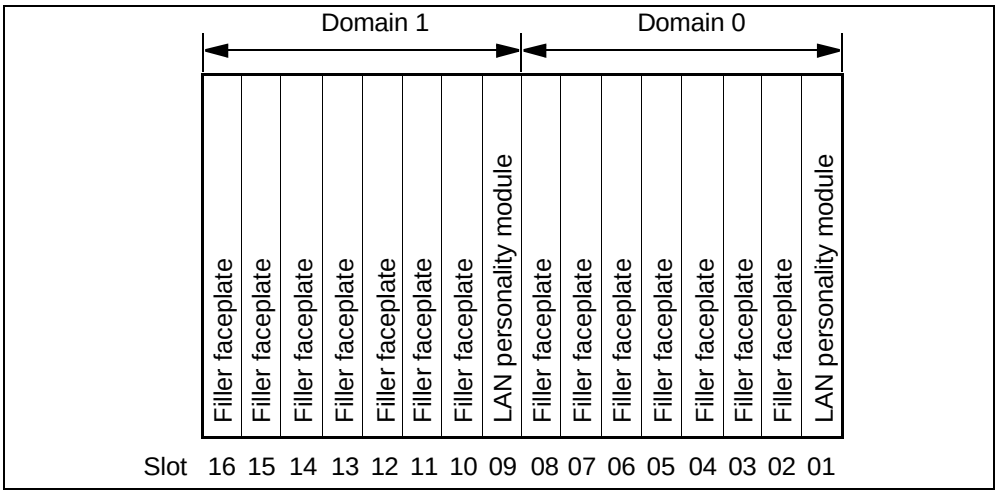


The chassis has a LAN personality module in slots 1 and 9. The module is used with the I/O controller module (NTRX50NL) that mounts at the front of the chassis. The following figure identifies the slot numbers in

[1] There is no alarm cable for the ICMs in the I/O expansion chassis.

domains 0 and 1, and the provisionable LAN personality modules in each slot number.

Rear view of the I/O expansion chassis by slot number

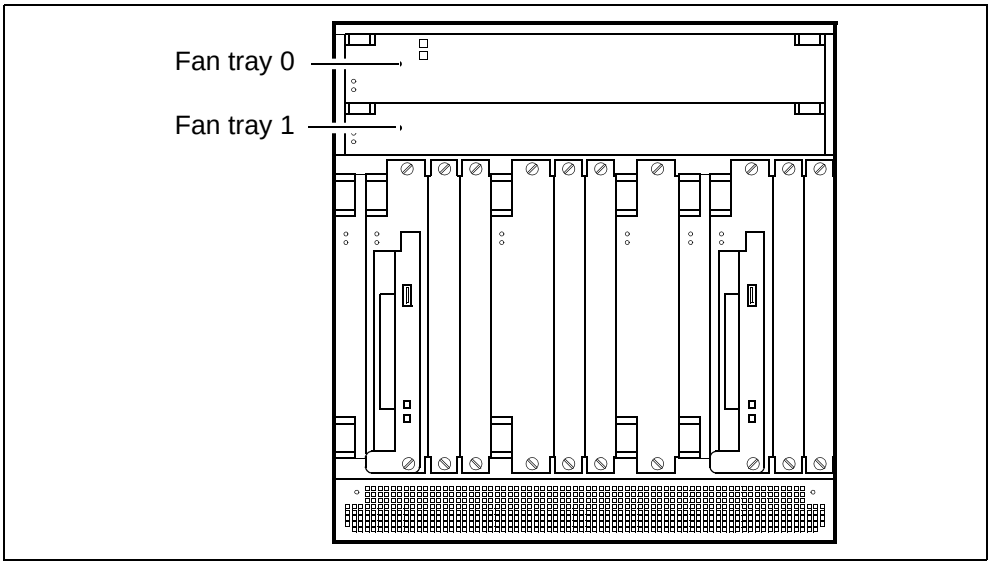


Provisionable personality modules in the I/O expansion chassis are not restricted to specific slot numbers. The LAN personality module mounts in any two slots. The slot numbers must match in each domain, and with the system module installed at the front of the chassis.

Front-mounted main chassis

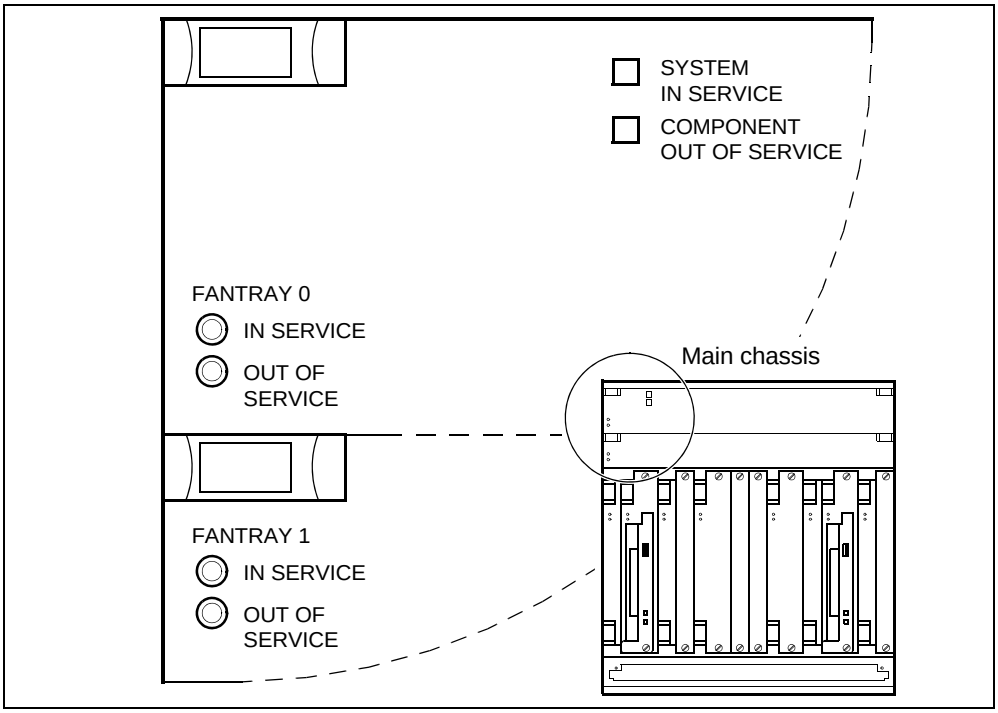
The front of the main chassis has fan trays, provisionable system modules and controller modules. The following figure shows a front view of the main chassis.

Front view of the main chassis



Two removable fan trays (NTRX50FE and NTRX50FF) provide horizontal (front-to-rear) cooling to the chassis. Both trays contain in-service and out-of-service LEDs.[1] The top tray (NTRX50FE) also contains system status LEDs. The following figure shows the fan trays and fan tray LEDs.

Fan tray LEDs on the main chassis



[1] The fan trays in the I/O expansion chassis do not have system status LEDs.

The following table lists the controller modules in the main chassis and their corresponding slot numbers.

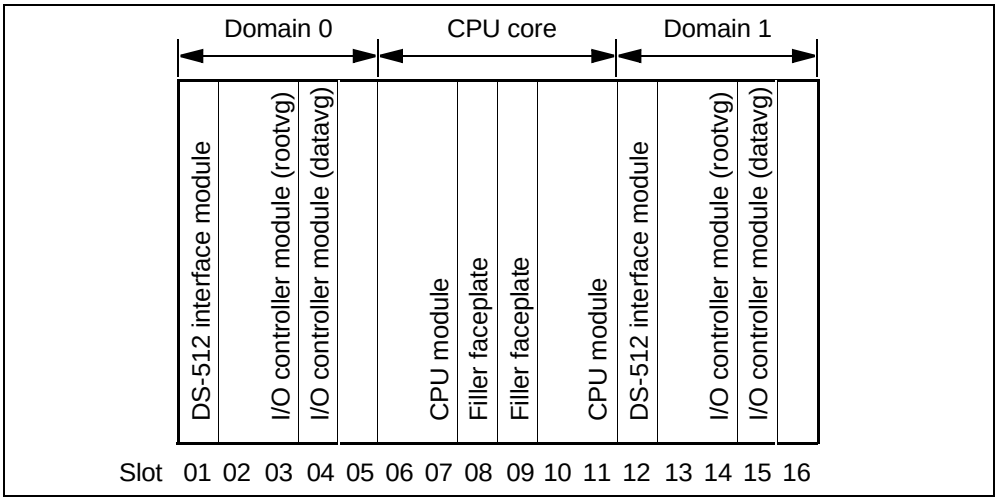
Quantity	PEC	Description	Slot(s)
2	NTRX50GX	DS-512 interface	1, 12
2	NTRX50ND or NTRX50NM	I/O controller (rootvg)	2, 3, 13, 14
2	NTRX50NC or NTRX50NL	I/O controller (datavg)	4, 5, 15, 16
2	NTRX50NB	CPU controller	6, 7, 10, 11

Note 1: If you have an NTRX50GA, you must upgrade it to the NTRX50GX. Refer to procedure “Upgrading the DS512 controller module from NTRX50GA to GX” in the Upgrades section.

Note 2: If you want to upgrade your I/O controller modules, refer to procedures “Upgrading the rootvg MFIO to MFIO or UMFIO” and “Upgrading datavg MFIO to MFIO or UMFIO” in the Upgrades section.

The following figure shows the slot numbers in domains 0 and 1, the CPU core, and the required system controller modules in the main chassis. The remaining slots are available for provisioning optional system modules.

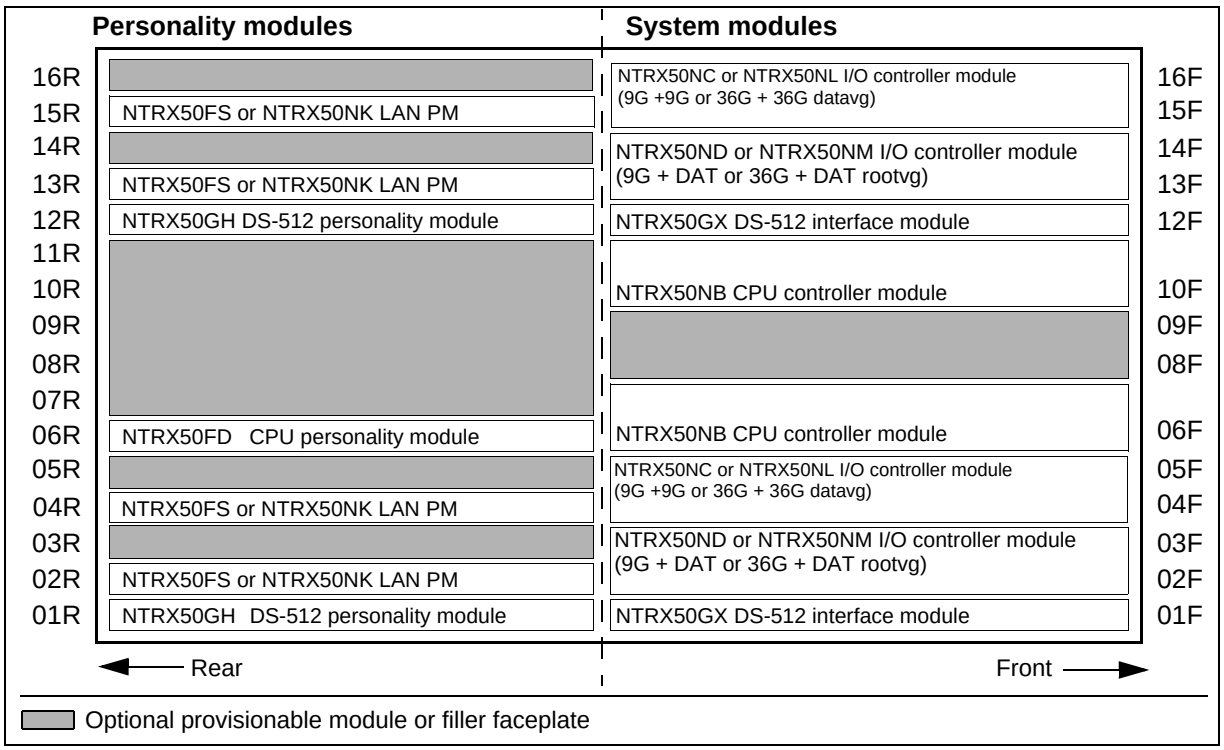
Front view of the main chassis by slot number



Module slot placement

The following figure shows the dedicated slot numbers for required CS 2000 Core Manager modules (front and rear). Provisionable equipment mounts in any slot number in either the main chassis or the I/O expansion chassis.

CS 2000 Core Manager module slot number layout (front and rear)



CPU controller module

The CPU controller module contains the main processing power and memory capacity of the CS 2000 Core Manager and is provisionable in slots 6, 7, 10 and 11 at the front of the main chassis.

DS-512 interface module

The DS-512 interface module is provisionable in slots 1 and 12 at the front of the main chassis. The module is used with the DS-512 personality module located in slots 1 and 12 at the back of the main chassis.

I/O controller module

The I/O controller modules and the associated personality modules provide mirrored disk storage, redundant DAT drives, and redundant

Ethernet links to the LAN. The controllers support the following volume groups:

- root volume groups (rootvg), which have one physical volume (disk)
- data volume groups (datavg), which have multiple physical volumes (disks)

The following table lists the types of MFIO/UMFIO controller modules.

MFIO/UMFIO controller modules

PEC	Provides
NTRX50NC or NTRX50NL (datavg)	Two 9-GB (NC) or 36-GB (NL) DDUs, a 10Base-T Ethernet interface
NTRX50ND or NTRX50NM (rootvg)	One 9-GB (ND) or 36-GB (NM) DDU, a DDS-2 DAT drive, a 10Base-T Ethernet interface

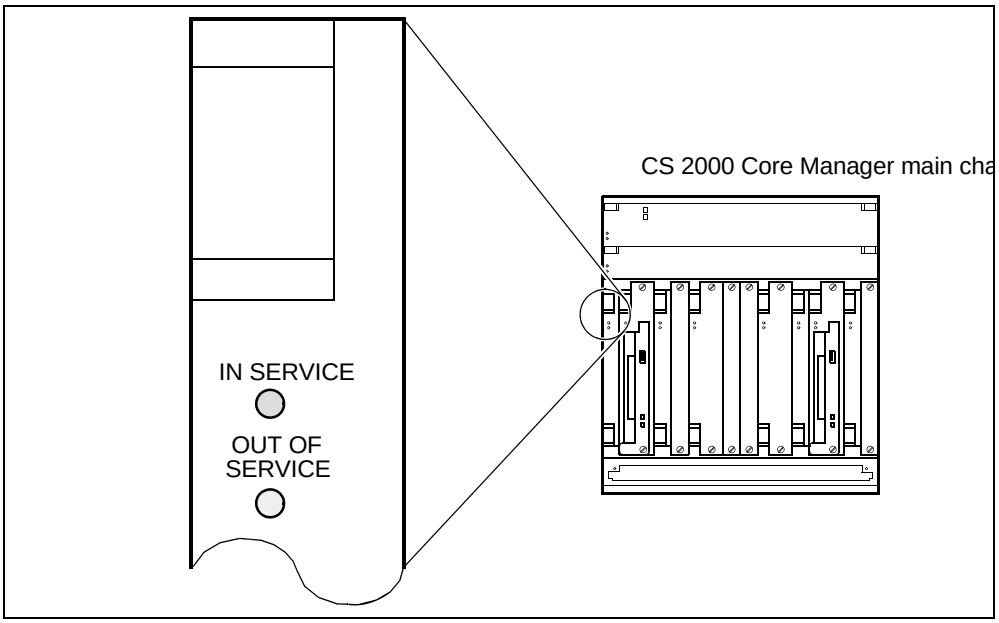
Optional slots at the front of the main chassis

Slots 4, 5, 8, and 9 at the front of the main chassis are not used except for additional provisionable equipment. Unused slots at the front contain filler panels to ensure electromagnetic interference (EMI) compliance and even distribution of cooling.

System module LEDs

Light-emitting diodes (LED) are visible on all system modules in the main or optional I/O expansion chassis. The following figure shows the LEDs on the system modules at the front of the main chassis.

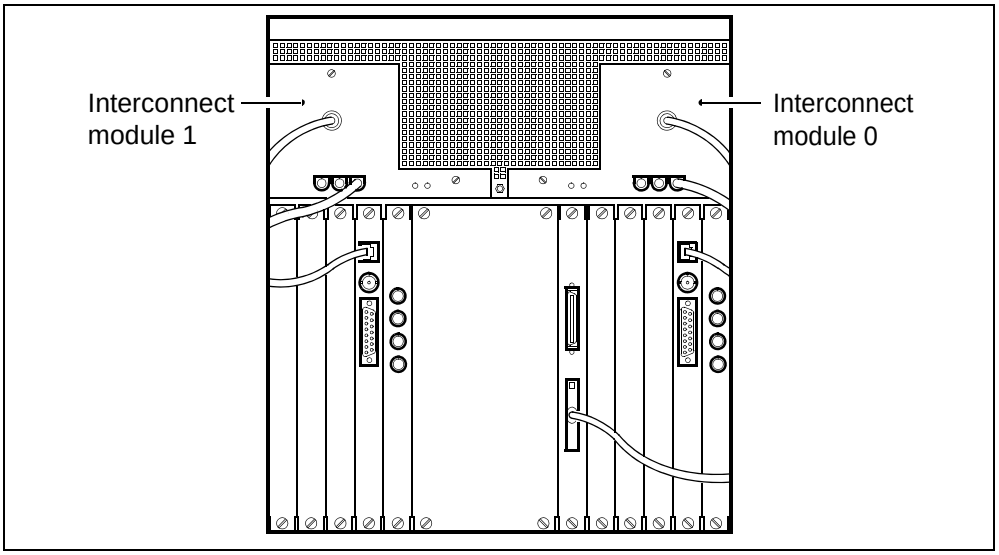
System module LEDs



Rear-mounted main chassis

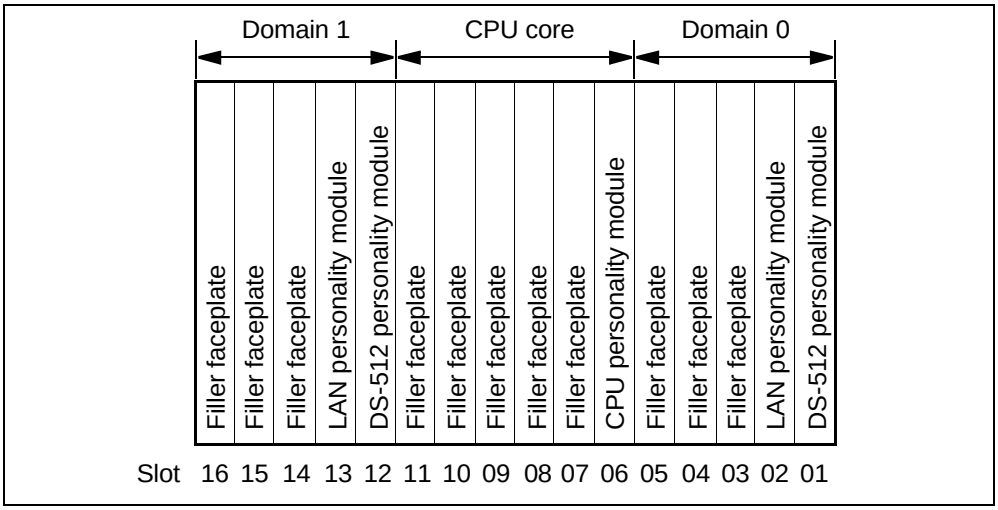
The rear of the main chassis contains two DS-512 personality modules (NTRX50GH) in slots 1 and 12, and two ICMs (NTRX50FG and NTRX50FH) that supply power to the CS 2000 Core Manager. The rear of the main chassis also contains two LAN personality modules (NTRX50FS or NTRX50NK or NTRX50NN) in slots 2 and 13, and one CPU personality module (NTRX50FD) in slot 6. The following figure shows a rear view of the main chassis.

Rear view of the main chassis



The following figure shows the slot numbers in domains 0 and 1, the CPU core, and required provisionable personality modules in each slot number. The remaining slots are available for optional personality modules.

Rear view of the main chassis by slot number



DS-512 personality module (NTRX50GH)
The DS-512 personality module mounts in slots 1 and 12 at the back of the main chassis, and connects to the DS-512 interface module in slots 1 and 12 at the front of the main chassis.

LAN personality module (NTRX50FS or NTRX50NK)
The LAN personality module mounts in slots 2 and 13 at the back of the main chassis. A LAN personality module connects to each I/O controller module in slots 2, 3, 13 and 14 at the front of the main chassis. The module supports 10Base-T port connection to the operating company LAN. Version NTRX50FS supports NTRX50NC MFIO controller modules. Version NTRX50NK (UMFIO LAN PM) supports NTRX50NL and NTRX50NM UMFIO controller modules.

CPU personality module (NTRX50FD)
The CPU personality module (NTRX50FD) mounts in slot 6 at the back of the main chassis. The CPU module NTRX50NB at the front of the main chassis connects to the CPU personality module, which provides console and modem port connection to the CPU module. For remote console access, port SP0 on the CPU personality module connects to a modem by a NTRX5093 cable. For local console access, port SP0 connects to a VT100 terminal by an NTRX5094 cable.

LAN/X.25 personality module (NTRX50NN)

The NTRX50NN personality module provides two physical connections to a LAN: X.25 and 10/100 BaseT. The NTRX50NN supports the NTRX50NM rootvg UMFIO module and the NTRX50NL datavg UMFIO module.

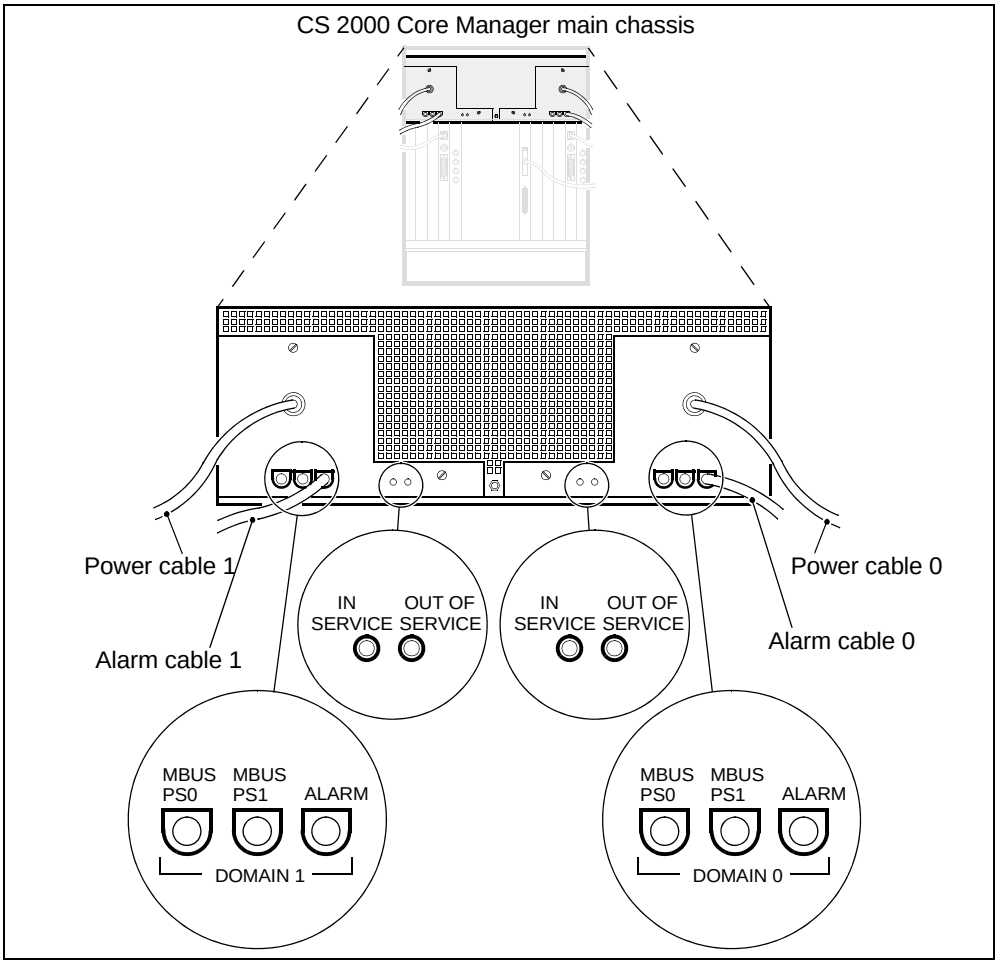
Optional slots at the back of main chassis

Slots 3 to 5, 7 to 11, and 14 to 16 at the back of the main chassis are for optional equipment. Unused slots must be equipped with filler panels to ensure EMI compliance, and to distribute cooling air evenly.

Interconnect modules (NTRX50FG, NTRX50FH)

Two ICMs at the rear of the main chassis and the I/O expansion chassis plug directly into the backplane. Each ICM supplies -48V dc to its corresponding domain through separate battery feeds, and has two LEDs that indicate when it is either in or out of service. The following figure shows a rear view of the interconnect modules.

Rear view of the interconnect modules



Power supply

Battery feeds A and B supply power to the hardware for the CS 2000 Core Manager. The feeds connect from the MSP to the chassis through the ICMs at the back of the chassis. Battery feed A supplies power to hardware in domain 0, and battery feed B supplies power to hardware in domain 1. Both domains provide power to CPU modules. Normally, both feeds are operational. During a single feed failure, the unaffected domain continues to provide service.

Fan unit

The fan unit provides vertical cooling for the C28B cabinet.

Software overview

Architecture

The CS 2000 Core Manager software has base, service and application layers that support parallel development in each stream. This architecture allows independent delivery of new services and applications and interim delivery of maintenance release software.

Base software layer

The base software layer supports CS 2000 Core Manager maintenance and operation, and consists of

- the AIX 4.3.3 operating system and server software
- node and process control services
- maintenance and administration services

Service software layer

The service layer provides common software utilities and functions for multiple applications, and internal application support software for current and future application packages. The following table lists the components of the service software layer.

Service software layer components

Component	Description
Table access utility	Allows applications on the CS 2000 Core Manager to manipulate tables maintained on the Core.
Remote procedure call (RPC)	Allows software on the Core to raise RPC routines to software on the CS 2000 Core Manager. RPC routines allow a program running on one host to request and receive a message with results of a service on another host.

Service software layer components

Component	Description
Open Software Foundation (OSF) Distributed Computing Environment (DCE) ***Note:*** DCE and DCE applications are manufacturer-discontinued (MD) in CS2E0090.	Provides authentication and authorization mechanisms for network security.
Operational measurement (OM) collection and application programming interface (API)	Allows applications on the CS 2000 Core Manager to receive OM data from the Core.

Application software layer

The application software layer provides applications for Core operations, administration, maintenance and provisioning (OAM&P), and contains all application software installed on the CS 2000 Core Manager.

Software and application order codes

The following table lists the software order codes for the CS 2000 Core Manager.

Software order codes

Name	Order code
CNCD Billing Filtering	CNCD0006
CNCD Billing Filtering	
CNCD CDR 01	CNCD0002
CNCD CDR Base	
CNCD CDR PH1	CNCD0001
CNCD CDR to AMA	CNCD0003
CNCD RTB OFT	CNCD0004
CNCE SDM AT&T Custom	CNCE0001
CNCE AMA DNS features	

Software order codes

Name	Order code
CNOM OM 02	CNOM0002
CNOM OM Base	
CNOM PH1	CNOM0001
LCS AdventNet SNMP V3	LCS00016
LCS Lic AdventNet SNMP V3	
LCS ILOG JView	LCS00014
LCS JView	

Software order codes

Name	Order code
PSPT 15K MSS Integration	PSPT0001
PSPT Exist OSS I/F Integration	
PSPT FCAPS API	
ATA ASCII Term Acc Gwy	ATA00001
ATA ASCII Access Gateway	
DDMS System Phase1	DDMS0001
DDMS Enhancement Pkg1	
DDMS OSS Data I/F	
DDMS Platform Ph1	
ENTA Enhanced Term Access	ENTA0001
ENTA Enhanced Term Access	
NMDC TCP/IP I/F NTM/DC	NMDC0001
NMDC TCP/IP I/F NTM/DC	
SBM AMADNS DDI I/F	SBM00003
SBM AMADNS DDI I/F FN	
SBM Billing Appl Base	SBM00001
SBM Auto File Xfer AFT	SBM00007
SBM Billing Appl Base FN	
SBM Capacity & Performance	
SBM Multi-Stream BAF/CDR	
SBM SBA-SMDR Delivery	SBM00006
SBM SBA SMDR	

Software order codes

Name	Order code
SFT ASG Enabling FT/SW SFT ASG Enabling FTSW fn	SFT00003
SFT Secure File Transfer SFT Secure File Transfer	SFT00001
UTA ASG Enabling TA/SW UTA ASG Enabling TASW fn	UTA00002
PLAT SDM STD FT Platform PLAT HiSpeed Log I/F PLAT SDM STD S/W	PLAT0005
CMNO Base001 CMNO FTAM001 CMNO x25L001	CMNO0002

Software delivery

New software is made available through the following methods:

- non-computing load (NCL), a major release of the software scheduled once or twice a year, delivered on tape
- maintenance non-computing load (MNCL), a maintenance release scheduled approximately every three months for the first year of a released NCL, delivered on tape
- CS 2000 Core Manager patching, fix filesets delivered electronically as soon as they are available

The CS 2000 Core Manager supports software streams of up to three releases back from the latest release. When upgrading your CS 2000 Core Manager software from one release to another, ensure that the computing module (CM) load release on the core is not higher than the software release on the CS 2000 Core Manager. Upgrade the CS 2000 Core Manager to the latest release of the software before you upgrade the core load. Upgrading a core to a release ahead of the CS2000 Core Manager creates an unsupported configuration.

For information on upgrading your CS 2000 Core Manager to the latest software release, refer to one of the following procedures in the SDM Upgrades document:

- “Upgrading CS 2000 Core Manager software”
- “Upgrading CS 2000 Core Manager software using ESUP”

For information on upgrading your CS 2000 Core Manager with software fixes, refer to the procedure “Upgrading the CS 2000 Core Manager with software fixes” in the Upgrades document.

User interfaces overview

Functional overview

The CS 2000 Core Manager supports local area network (LAN)-based input/output (I/O) interfaces to the components in the following table.

Components with interface to the CS 2000 Core Manager

Component	Description
Workstation	Configured as remote user interface (UI) client for CS 2000 Core Manager applications; requires open software foundation (OSF) distributed computing environment (DCE) client software ***Note:*** UI client performance depends on workstation performance.
Hub	Required for 10Base-T or unshielded twisted pair (UTP) LANs
Router	Performs wide area networking (WAN) for CS 2000 Core Manager graphical user interfaces (GUI); provides gateway (or protocol translator) functions ***Note:*** Routers in a Carrier Voice over IP Network must support BOOTP forwarding.
Terminal server	Provides asynchronous access to the CS 2000 Core Manager; ports used either instead of, or in addition to, integrated asynchronous application ports; engineering rules applications determine the number of required asynchronous ports

Workstations

The following table lists the workstations that can be configured as UI clients for CS 2000 Core Manager applications.

Workstations that support UI clients

Workstation	Operating system
Hewlett-Packard 700/800 series	HP-UX 10.20 with HP DCE version 1.5 (based on OSF DCE version 1.1)
Sun SPARC	Solaris 2.7, 2.8, 2.9 (to current) with IBM DCE version 3.2 (based on OSF DCE version 1.2.2)

Access to some functions requires the use of Secure Shell (SSH)-compatible client software for access to secure telnet and ftp services (through the SSH standard). SSH clients are supplied bundled

with some operating systems, but may need to be obtained separately. The following table lists some sources for SSH clients; sources are not limited to those listed in this table.

Sources for SSH clients

Source	Type
PUTTY	freeware
OpenSSH	freeware
SSH Inc.	commercial
Secure CRT	commercial
WinSCP	freeware

Maintenance interfaces

The following table lists the maintenance interfaces for the CS 2000 Core Manager.

CS 2000 Core Manager maintenance interfaces

Interface	Description
MAP (maintenance and administration position) CI (MAPCI)	Primary access to the Core for maintenance during normal CS 2000 Core Manager-to-Core operations. A dedicated core manager maintenance subsystem at the APPL level of the MAP allows users to • determine the node status and operating condition of the core manager • change the state of the core manager for maintenance • determine the status of connectivity between the Core and the core manager • reboot or halt the core manager • change the state of core manager hardware • use the QUERYSDM command to determine the status of core manager applications and operating system, including faults that currently affect applications and system software resources
SDM maintenance (sdmmtc)	Secondary access from the core manager for maintenance when CS 2000 Core Manager-to-Core communication is interrupted (CM is unavailable). Provides • control and maintenance access to all maintenance capabilities normally available through the MAP interface when connectivity to the CM is not available • control and maintenance of core manager hardware, and of individual core manager application packages • complete administration capabilities, including software and user administration and configuration changes

Accessing the Core

Support for the CS 2000 Core Manager requires access to Core-based maintenance interfaces, such as the Maintenance and Administration Position (MAP).

Types of Core access

The CS 2000 Core Manager requires two types of access to the Core:

- Primary
- Secondary

Having two types of access allows staff to perform configuration, maintenance, and operations activities in most fault scenarios. Offices should have mechanisms and procedures to support both types of access.

Primary access

Primary access is the normal method of access available to most staff. Primary access is suitable for most maintenance activities that do not affect service.

Secondary access

Secondary access is the emergency method of access available to a restricted group of office and support staff. Secondary access requires direct access to console ports and reset terminal interface (RTIF) terminals.

Secondary access is suitable for most maintenance activities that affect service. The following types of activities are performed through secondary access:

- Core restarts
- Core maintenance switch of activity
- Changes to tables IPNETWRK and IPHOST
- Changes in state of the following network elements:
  - Ethernet interface unit (EIU)
  - Link peripheral processor (LPP)
  - CS 2000 Core Manager
- Software upgrades

Methods of Core access

The CS 2000 Core Manager offers the following methods to access the Core:

- Local access through Core console
- Remote access through Core console
- Telnet access through terminal server
- Telnet access through EIU
- Nortel access applications
- Telnet access through CS 2000 Core Manager
- Local access through CS 2000 Core Manager console
- Telnet access through a terminal server with Atlantic Systems Group (ATA) Universal Terminal Access (UTA)

Note: A secure shell (SSH) client is available in some releases as an alternative to telnet.

Local and Remote access through the Core console

The Core console is a VT100 console physically connected to the input-output controller (IOC)/input- output module (IOM) port in the Core. The console provides two types of access:

- Local access at the console
- Remote access through a modem to the console

The Core console has an RS-232 connection to the IOC/IOM port. Remote access requires a modem and an analog telephone line to the modem.

Telnet access through the terminal server

Some offices use a terminal server to provide remote access to the Core through a local area network (LAN) or a wide area network (WAN). A terminal server can provide access through a LAN/WAN to the following ports and devices:

- RTIF
- IOC/IOM port
- CS 2000 Core Manager SP0 and SP1 ports

To access the Core through a terminal server, perform the following tasks:

1. From a workstation on the LAN/WAN, telnet to the terminal server.
2. From the terminal server, manually log in to the Core with a Core userid.

The terminal server uses Transmission Control Protocol (TCP) for LAN/WAN communications and an RS-232 connection to the switch-based device or port.

Telnet access through EIU

The EIU is an optional component in XA-Core configurations. To access the Core through the EIU, perform the following tasks:

1. From a workstation on the LAN/WAN, telnet to the EIU.
2. From the EIU, manually log in to the Core with a Core userid.

The EIU uses TCP for communications to the LAN/WAN and the Core.

Nortel access applications

The following Nortel applications provide access to the Core:

- ASCII Terminal Application (ATA)
- Enhanced Terminal Application (ETA).

The *CS 2000 Core Manager Security and Administration* NTP provides procedures to use these applications to access the Core.

ATA and ETA use the following interfaces to access the Core:

- Distributed Computing Environment (DCE) cell for access to client and server applications
- TCP for communications to the Core and LAN/WAN-based nodes
- DCE/TCP/User Datagram Protocol (UDP) for LAN-based communications to DCE security servers and the CS 2000 Core Manager

Telnet access through the CS 2000 Core Manager

The CS 2000 Core Manager provides indirect telnet access to the Core. To access the Core through the CS 2000 Core Manager, perform the following tasks:

1. From a workstation on the LAN/WAN, telnet to the CS 2000 Core Manager.
2. Manually log in to the CS 2000 Core Manager as an admin user.

3. From the CS 2000 Core Manager, telnet to the Core over the DS-512 link.
4. Manually log in to the Core with a Core userid.

The CS 2000 Core Manager uses TCP for communications to the Core and LAN/WAN-based nodes.

Telnet access through the CS 2000 Core Manager console

The CS 2000 Core Manager console is a VT100 console physically connected to the SP0 port on the CS 2000 Core Manager. The CS 2000 Core Manager console provides indirect access to the Core. To access the Core through the CS 2000 Core Manager console, perform the following tasks:

1. Manually log in to the CS 2000 Core Manager console as an admin user.
2. Telnet to the Core over the DS-512 link.
3. Manually log into the Core with a Core userid.

Telnet access through a terminal server with ASG UTA

ASG UTA is a third-party application that provides secure access to the Core. ASG UTA is an optional application available with some releases. Consult the ASG UTA documentation for information on this product.

Accessing the CS 2000 Core Manager

The following methods are used for accessing the CS 2000 Core Manager:

- Local access through CS 2000 Core Manager console
- Telnet access through the operating company local area network (LAN)
- SDMRLOGIN

Local access through the CS 2000 Core Manager console

The CS 2000 Core Manager console is a VT100 console physically connected to the console port (SP0) on the CPU controller module on the CS 2000 Core Manager. The console provides two types of access:

- Local access at the console
- Remote access through a modem to the console

The CS 2000 Core Manager console uses a null modem cable to connect to the CS 2000 Core Manager. Remote access requires a modem and an analog telephone line to the modem.

Telnet access through the operating company LAN

Some operating companies allow telnet access through the local LAN. This method of access requires telnet enabled on the CS 2000 Core Manager.

SDMRLOGIN

SDMRLOGIN is a non-menu command available at any level of the maintenance and administration position (MAP). SDMRLOGIN creates a telnet session from Core to the CS 2000 Core Manager. SDMRLOGIN is used to access CS 2000 Core Manager nodes that are either in service (InSv) or in-service trouble (ISTb).

SDMRLOGIN is supported only on DS-512 connected core managers.

System Access Security

To prevent a possible breach of system security through wide distribution of the *root* user password, several user authorization levels are available. In addition to the *root* and *maint* user authorization levels, two additional authorization levels enable you to distribute tasks formerly performed by the root user to users in other user authorization-level groups. These groups are “SysAdm”, for users who are allowed to perform system administration tasks, and “secadm”, for users who are allowed to perform security and administration tasks. The following table shows the basic tasks that can be performed by users in these authorization-level groups, which are known as “role groups”.

Function	Role Group			
	Root	SysAdm	secadm	Maint
Initial system installation	*			
Application software installation	*	*		
Application software upgrades	*	*		*
User administration, such as creating users and adding users to groups	*		*	
Application configuration that effects system service	*	*		
Application configuration that doesn’t effect system service	*	*		*
Application state changes	*	*		*
Data access	*	*		*
Backup	*	*		*

Administration of the role groups is performed through the SDMMTC maintenance interface and includes the following tasks:

- displaying lists of groups and the users in a group
- displaying lists of users and the groups they belong to

- creating and removing users
- adding users to a group, or deleting users from a group

Tools and utilities

Logs

Logs from the computing module (CM), other nodes within the network, and from the core manager application software are routed and stored through Generic Data Delivery (GDD). GDD maintains a /gdd directory on the core manager (in volume group datavg) of up to 30 days of logs. For more details about GDD, refer to Generic Data Delivery overview on page 56.

The Log Delivery application includes the following tools for viewing and managing log files:

- logquery
- logroute log receiver
- logroute log delivery commissioning

For more information about Log Delivery, refer to Log Delivery Application overview on page 51.

Administration

Authorized users can use tools at a core manager maintenance interface and UNIX-based utilities at a VT100 console (local or remote) to:

- commission the core manager platform
- monitor system resources
- back up and restore software functions

For information on how to log in to the CS 2000 Core Manager as an authorized user or how to display other information about a user or role group, review the procedures in the following table.

Procedure	Document
Logging in to the CS 2000 Core Manager	*CS 2000 Core Manager Security and Administration*, NN10170-611
Displaying information about a user or role group	*CS 2000 Core Manager Security and Administration*, NN10170-611

Operational Measurement Delivery overview

Functional overview

The Operational Measurement Delivery (OMD) application collects customer-defined operational measurement (OM) data from the DMS switch, and stores the data in OM report files on the core manager in comma-separated value (CSV) format. The OMD application is configured using the OM user interface (OMUI).

An OM report file is a collection of OM groups that are monitored at selected reporting intervals. Secure File Transfer (SFT) or File Transfer Protocol (FTP) sends OM report files from the core manager to an operations support system (OSS). A data browser such as a spreadsheet program provides access to the contents of the files.

Report elements

Report elements define the content of OM report files, and combine content of related OM groups for monitoring and analysis. A report element contains a user-defined report element name, a reporting interval for a report element (five minutes, or the office transfer period of 15 or 30 minutes), and names of the OM groups and registers.

Subtraction profiles

The subtraction profile determines the change in the value of an OM group register between five-minute OM reports, as defined in a report element. The subtraction profile applies only when the reporting interval is set to five minutes. The following table lists the types of subtraction profiles.

Subtraction profiles

Type	Description
Single	A single register represents a running total
Double	Two registers (base and extension) represent a running total
Non-subtraction	Subtraction is not performed on selected registers

Data collection schedules

A data collection schedule defines start and stop times for OM report collection. The collecting interval determines how often in the time period an OM report collection occurs. The data is collected to the same

report file for schedules with collecting intervals after midnight. The following table lists the data collection schedule types.

Data collection schedule repetition types

Repetition	Schedule information
Daily	Daily start and stop time. Format: hhmm, *where* hh = hour (00 to 24), and mm = minute (00 or 30). Specifies only a single time period; for multiple time periods in the same day, you must define multiple schedules.
Weekly	Weekly start and stop time. Values: Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday. Format: hhmm; multiple days can be specified in same schedule.
Monthly	Monthly start and stop time. Values:1 to 31. Format: hhmm; multiple days can be specified in the same schedule.

File rotation schedules

File rotation schedules specify when to rotate report files. File rotation closes an open report file and moves it to the */omdata/closedNotSent* directory on the core manager. Each file rotation schedule contains

- a user-defined file rotation schedule name
- a repetition rate for the rotation schedule based on either the number of report records collected or the number of hours to collect records
- a schedule that defines the time to rotate the report file

The data collection and file rotation schedules operate independently of each other. If a file rotation schedule event occurs during a scheduled data collection period, the file rotation schedule closes and rotates the OM report file, and a new OM report file with the same name is opened. The new file starts collecting immediately and continues until the end of the collection period. The open OM report file remains in the */omdata/open* directory until the file rotation schedule closes it and rotates it to the */omdata/closedNotSent* directory.

File transfer destinations

File transfer destinations define remote downstream destinations of OM report files. Each destination entry contains

- a user-defined file transfer destination name
- the valid IP address of a remote destination host (xxx.xxx.xxx.xxx)

- the FTP port address of the remote host (default: 21)
- the remote host login ID and password

Note: The core manager does not authenticate the IP and port addresses or the login ID and password.

An invalid destination causes the file transfer to fail. When a file fails to transfer, log entries are written to the customer log file at */var/adm/custlog*. The file is not re-sent, and the report file must be transferred manually using either the OMFTP command, SFT or standard FTP.

File transfer schedules

File transfer schedules specify when to transfer OM report files downstream. Each file transfer schedule contains a

- user-defined file transfer schedule name
- repetition rate for the transfer schedule
- schedule defining when to transfer the report file (if using a repetition rate)
- remote file transfer destination host system (<16 destinations/schedule)
- destination storage directory for each defined transfer destination

The files are transferred downstream using FTP, and move from the */omdata/closedNotSent* directory to the */omdata/closedSent* directory. If a scheduled file transfer fails, a log is raised and the report file that could not be transferred moves to the */omdata/closedSent* directory. The OMDD keeps track of the destination to which the report file could not be transferred. Then, at the next scheduled file transfer, the OMDD attempts to send the report file to the destination again. The OMDD will repeat this activity until one of the following situations occurs:

- the file is transferred successfully
- the file exceeds the retention period for the *closedNotSent* directory
- the file gets deleted during an audit because the *omdata* filesystem usage has exceeded the allowable limit
- the file is deleted by the omdelete utility

Report registrations

A report registration links information from the report element and schedules for data collection, file rotation and file transfer to collect OM data. The user can create up to 32 report registrations. Once a report registration has been created, it can be deleted but not modified. Each

report registration contains user-defined names for the report registration, report elements and each schedule type. The schedules become active immediately after the creation of the report registration.

An OM report file opened by the data collection schedule in the */omdata/open* directory uses the name of the report registration as part of the OM report file name. Linking a file transfer schedule into a report registration provides regular and automatic transfers of OM report files to remote downstream destinations. Unless you link a file transfer schedule to a report registration, you must manually transfer your OM report files downstream.

Report registration limit

The report registration limit is the maximum number of report registrations that can be configured on a core manager without affecting processing performance. The number of report registrations range from 1 to 32 (default value: 32). To set the limit, use the “Set Report Registration Limit” from the OMUI main menu.

File retention periods

A cleanup of OM report files that have been sent downstream automatically occurs every night at midnight (00:00 or 24:00). Files in the */omdata/closedSent* directory are deleted at an interval based on the file retention period defined in the OMUI (range: 1 to 14 days). The default interval is set to 7 days at OMD installation. Unsent OM report files older than 32 days in the */omdata/closedNotSent* directory are deleted. This 32-day default value is read from a configuration file set up when the core manager is commissioned.

OMD data collection capacity

Collection of more than 10,000 tuples reduces core manager performance and the retention period for OM report files.To determine the number of tuples in an OM group, either monitor the OM group and count the tuples in the report file or use the OMSHOW command from the MAP (maintenance and administration position) on the DMS switch.

Use the formulas in the following table to calculate the limit for OMD data collection.

Formulas for calculating the limit for OMD data collection

OMD data capacity transfer type	Formula
5- and 15-minute	**x+ y/3 = n <= 10,000 tuples** *(without loss of data)*
5- and 30-minute	**x+ z/6 = n <= 10,000 tuples** *(without loss of data)*
where: **x** = the number of OM tuples collected every 5 minutes **y** = the number of OM tuples collected every 15 minutes **z** = the number of OM tuples collected every 30 minutes **n** < 10,000 tuples	

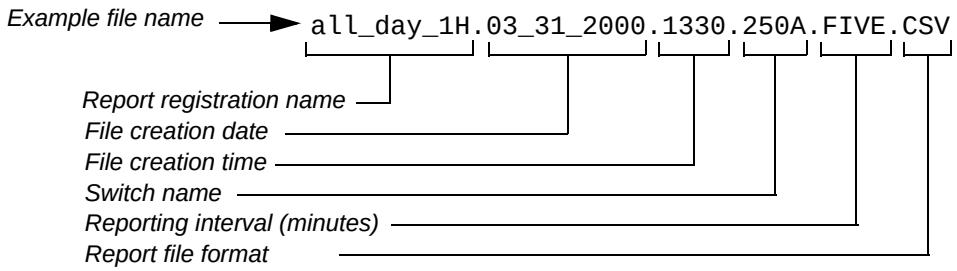
The following table lists the current OMD data collection capacity.

OMD maximum data collection capacity

Transfer type	Capacity (number of tuples)
5-minute	6000
15-minute	12,000
30-minute	24,000

OM report file naming

Report files are named according to the report registration name, file creation date and time, name of the switch generating the OMs, and reporting interval. Refer to the following example file name and explanation.



OM report file contents

Tuple information for an OM group can be viewed in CSV format from the OM report file on the core manager, and by entering the OMSHOW command on the MAP. The following table shows an OM report file.

Contents of an OM report file

Date	Time	Switch Names	Group Name	Key/Info Field	Reg1 Name	Reg1 Value	Reg2 Name	Reg2 Value	Reg31 Name	Reg31 Value
2/23/00	3:35 :00	250U	TRK	ISU_GWC.2W.0.0	AOF	0	ANF	0		
2/23/00	3:35 :00	250U	TRK	ESADGTR.OG.0.0	AOF	0	ANF	0		
2/23/00	3:35 :00	250U	TRK	HSET.OG.3.0	AOF	0	ANF	0		
2/23/00	3:35 :00	250U	TRK	JACK.OG.2.0	AOF	0	ANF	0		
2/23/00	3:35 :00	250U	TRK	LTU.OG.2.0	AOF	0	ANF	0		
2/23/00	3:35 :00	250U	TRK	MONTALK.OG.0.0	AOF	0	ANF	0		
2/23/00	3:35 :00	250U	TRK	OCKT.OG.0.0	AOF	0	ANF	0		

Audits

The OM report files are stored in the omdata filesystem. This filesystem is audited every 30 minutes for the amount of usage. To ensure that the omdata filesystem usage does not reach 100% at any time, the system performs the following actions:

- When the filesystem usage reaches 60%, Major trouble log SDM338 is raised indicating that OM report files will be deleted at the time of the next audit, if usage exceeds 90%. Then, if usage exceeds 90% at the time of the next audit log SDM639 is raised

indicating all report files in the closedSent directory will be deleted, and the report files are deleted.

- If omdata filesystem usage does not fall below 80% after deletion of all report files in the closedSent directory, report files from the closedNotSent directory will be deleted, starting from the oldest file, until the usage is at 80% or less. As each report file is deleted from the closedNotSent directory, log SDM631, which describes the action, is raised.

SuperNode Billing Application overview

Functional description

SuperNode Billing Application (SBA) runs on the CS 2000 Core Manager and Core platforms. The Core receives formatted billing records, buffers them, and sends them to the CS 2000 Core Manager for storage in files until they are sent to downstream billing processors.

For complete information about the SBA, and about tools related to SBA processing, refer to *CS 2000 Core Manager Accounting*, NN10126-811.

Enhanced Terminal Access overview

Functional overview

The Enhanced Terminal Access (ETA) application provides secure remote access to the CS 2000 Core Manager across transmission control protocol/Internet protocol (TCP/IP)-based local- and wide-area networks (LAN/WAN). ETA has a server on the CS 2000 Core Manager and either an ETA client or an ASCII Terminal Access (ATA) client. ETA supports

- CS 2000 Core Manager applications that have a command line interface, such as the CS 2000 Core Manager maintenance interface
- CS 2000 Core Manager UNIX shells
- the computing module (CM) command interpreter (CI)
- MAP (maintenance and administration position)

Encryption protects information sent between the ETA server and the ETA clients, and between the ETA server and the CS 2000 Core Manager or CM.

Components

ETA has one server application installed on the CS 2000 Core Manager, two client applications, and Distributed Computing Environment (DCE) client user profiles. The two client applications can be used at the same time on the network. The following table describes the components of ETA.

ETA components

Component	Description
ETA server	Provides Telnet emulation of CM and CS 2000 Core Manager for ETA and ATA clients; logs client applications into CM and CS 2000 Core Manager; handles information exchange between the CM and CS 2000 Core Manager and clients; supports a maximum of 50 CM sessions. Maximum number of sessions depends on number of TCP sessions used on DMS (configured in Table IPHOST in DMS switch); supports up to 64 CS 2000 Core Manager sessions.
ETA client	Connects to ETA server to perform CM and CS 2000 Core Manager terminal sessions; has graphical user interface (GUI); allows user to change DCE password. UNIX platforms that support ETA clients are Hewlett-Packard (HP) and SUN.

ETA components

Component	Description
ATA client	Connects to ETA service to perform CM and CS 2000 Core Manager terminal sessions; has command line interface; does not allow user to change DCE password.
DCE security server	Validates users; used by system administrator to configure and store user profiles, which determine user access privileges to ETA, CM and CS 2000 Core Manager. (UserIDs must be set up in DCE before using ETA.) For more information about DCE, refer to Secure File Transfer overview on page 42.

ETA control characters

The ETA server uses control character and break sequences that are supported through input/output controller (IOC)-based VT100 type terminals. The control sequences in the following table are available on both ETA and ATA clients for CS 2000 Core Manager and CM-hosted sessions.

ETA control characters

Character	Function
Ctrl B	Toggles break mode ON or OFF ***Note:*** The break sequences are CM-specific. Once you enter the break mode, you can use all available break commands. The keyboard sequence, Ctrl-B, is used to toggle the break sequences ON or OFF.
Ctrl E	Deletes all characters from the cursor position to the end of the line
Ctrl F	Moves the cursor 1 position to the right
Ctrl H	Moves the cursor 1 position to the left
Ctrl I	Places the terminal in insert mode
Ctrl Q	Allows the screen to scroll
Ctrl S	Prevents the screen from scrolling
Ctrl U	Erases the entire line
Ctrl X	Exits from insert mode

ETA control characters

Character	Function
Ctrl \	Toggles control character sequence ON or OFF ***Note:*** The ETA control character sequences can interfere with other tools. To use a tool like the UNIX editor vi or the UNIX command passwd, you must turn off the ETA control characters. For CM- and CS 2000 Core Manager-hosted sessions, the control characters are off by default.
Delete key	Deletes the current character
?	Recalls one of the last three lines (depending on the number of ?s)

Secure File Transfer overview

Functional description

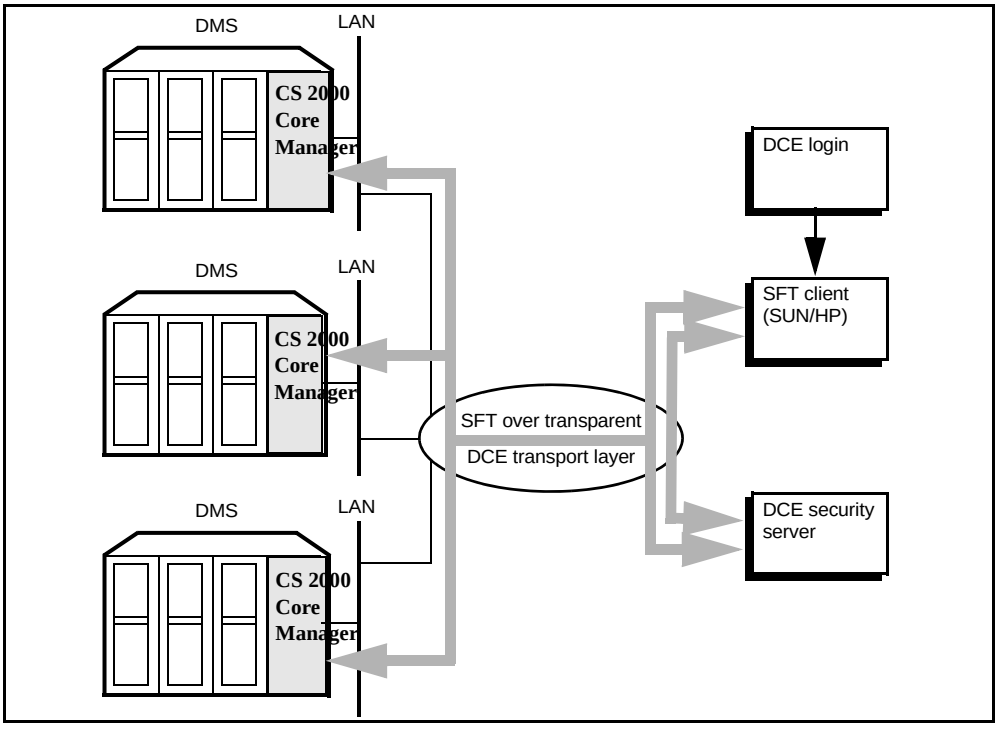
The Secure File Transfer (SFT) application provides file transfer to or from a DMS SuperNode or CS 2000 Core Manager across local- and wide-area networks (LAN/WAN). The SFT application can be either Distributed Computing Environment (DCE)-based or non-DCE based.

DCE-based configuration

The SFT uses DCE security servers to validate users. The SFT server and client user must be configured in the DCE cell. A remote procedure call (RPC) sets up the transparent Transmission Control Protocol/Internet Protocol (TCP/IP) connection for user validation. The following figure shows the components of the DCE-based SFT.

Note: DCE and DCE applications are manufacturer-discontinued (MD) in CS2E0090.

DCE-based SFT application



The following table describes the components of the DCE-based SFT.

Components of DCE-based SFT

Component	Description
SFT client	Provides secure file transfers to and from the CS 2000 Core Manager and the CM. Runs on Hewlett-Packard (HP) and Sun SPARC platforms on remote workstations. DCE security server authenticates login. For a list of specific platforms, refer to User interfaces overview on page 20.
SFT server	Transfers files to and from remote SFT or FTP clients. Requires SDMN0009 or higher operating systems.
CM server	Provides file transfer service to and from the CM storage devices; number of concurrent sessions limited to available FTP server connections on the CM. Each connection to CM uses specially assigned UserID. System randomly generates password.
DCE security server	Contains the database of extended registry attributes (ERA) that store SFT client user profiles. Authenticates SFT client UserID, password, and server. Login requires UserID and password.

The DCE-based SFT application supports a single login. UserIDs and passwords are encrypted and correspond to a DCE security account. For more information on logging in to DCE, refer to “Configuring the SFT server application software” in the Configuration management document. The following table describes workstation login configurations.

DCE login configurations

Login type	Description
Integrated	Login session begins when you log on to UNIX
Non-integrated	User profile includes a DCE login command; DCE authentication occurs once for each work session
No DCE	SFT starts without login to DCE; SFT client prompts for the DCE UserID and password each time the SFT client starts

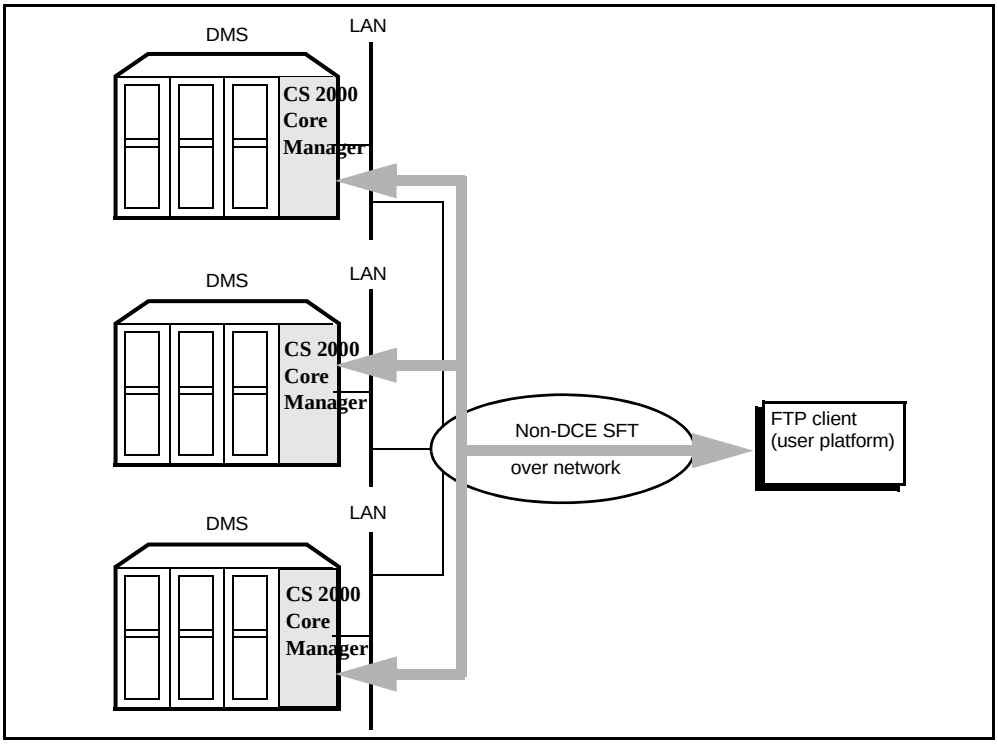
Non-DCE-based configuration

The non-DCE SFT configuration uses standard file transfer protocol (FTP) to send un-encrypted (ASCII text) login UserIDs and passwords across the network from the FTP client to the SFT server. Because the

configuration does not provide user authentication, it does not offer secure file transfer.

Because the DCE security server is not present in a non-DCE based configuration, a DCE login is not required. Instead of a single login, the user enters a UNIX login for each CS 2000 Core Manager. The following figure shows how an FTP client uses FTP to connect to the CM and the CS 2000 Core Manager.

Non-DCE based SFT application



DMS Data Management System overview

Functional overview

The DMS Data Management System (DDMS) application runs on the CS 2000 Core Manager platform, provides an interface for accessing DMS provisioning data, and supports the Operation Support System Data Interface (OSSDI). The OSSDI is a DMS common machine interface that defines a message protocol between the operations support system (OSS) and the DDMS.

Hardware

The following table describes the hardware components associated with the DDMS. For details of DDMS requirements, refer to the procedure “Installing DDMS.”

DDMS components

Component	Description
Client workstation	Runs the client application or web browser
Web server	Manages communications with the client workstation
CS 2000 Core Manager	Is the host for the DDMS

Software

Use the latest software version and patch loads available. For details of DDMS requirements, refer to the procedure “Installing DDMS.”

The following table describes the interactive DDMS subsystems.

DMS subsystems

Subsystem	Description
User administration (uAdmin)	Controls user authorization profiles through OSSDI commands; assigns client, operation, table and network element (NE) security groups
Communications router (COMMS)	Controls communications between external clients and local DDMS subsystems, and communications between local subsystems; provides single point of entry into DDMS through a DCE/RPC interface

DMS subsystems

Subsystem	Description
Synchronization interaction and maintenance (SIMS)	Propagates table updates to the computing module (CM); handles maintenance for provisioning
System administration (SysAdmin)	Supports commands for system parameters, logs and process control
Transaction manager (TxMgr)	Coordinates interactions between the client and the DMS

DMS Maintenance Application Overview

Functional description

The DMS Maintenance Application on the CS 2000 Core Manager is used to communicate trunk and line maintenance messages from the Preside Management for Carrier Voice over IP Solutions (MSS) to the Computing Module (CM) through the CS 2000 Core Manager maintenance interface.

The DMA translates the OSSDI trunk and line maintenance messages into a format that the CS 2000 Core Manager maintenance interface understands and can forward to the CM.

Image Dump Service Application overview

Functional description

The Image Dump Service application on the CS 2000 Core Manager is an interface between the system load module (SLM) on the call server's computing module (CM) and the CS 2000 Core Manager. The purpose of the image dump service application is to reduce the amount of time the CM restricts table changes when performing an image dump.

The CM sends a partial image dump to the CS 2000 Core Manager. The CS 2000 Core Manager stores the partial image on a local disk. After the transfer, the CM allows table changes and completes the image dump of the data on the CS 2000 Core Manager to the CM's SLM drive in the background. The image dump data is deleted immediately after the CM completes the image dump process.

The CM controls the image dump application. The CS 2000 Core Manager acts only as a temporary storage device.

The image dump service application is installed and removed using the Software Inventory Manager (SWIM).

Software inventory manager (SWIM) overview

Functional description

The software inventory manager (SWIM) provides you with an easy-to-use interface to perform the following tasks:

- install new software
- install and schedule the automatic application of software fixes
- update existing software with a newer version
- remove existing software
- sort and toggle the filesets listed
- view the history of when software was applied, removed, or configured
- change the software source
- configure software

You can access the SWIM level from anywhere in the maintenance interface by typing **swim** and pressing the Enter key.

The SWIM level displays the filesets that differ from the defined load, the status of those filesets, and the product code and version of the installed software load. The Details level displays a list of all the filesets that exist on the system and their status. The Fixes level displays a list of the fix filesets that exist in the predefined fixes directory and their status.

Use the Help command at the SWIM level or any of its sublevels to obtain information on the commands available at that level, as well as the meaning of the fileset status. An example of the SWIM level is provided in the following figure.

Example of SWIM level screen

```
   SDM   CON    512   NET   APPL   SYS   HW   CLLI: MSH2XACORE
    .     .     ..     .     .     .     .   Host: pcary71c
                ..                             Fault Tolerant


SWIM
 0 Quit         Product Code                      Version
 2 Apply        CS2E0006                          6.0
 3 Details
 4 Fixes     Fix Fileset Description          Version      Status
 5 Config    SSH Secure File Transfer         18.20.0.0    NEW
 6 Options   CS2E0006.0                       19.72.0.0    NEW
 7 History
 8                                      Fileset Status: 1 to 2 of 2
 9
10
11
12 Up
13 Down
14 Search
15
16 View
17 Help
18 Refresh
  root
Time 15:28 >
```

SWIM modes

SWIM operates in read-only mode and full-function mode.

- Read-only mode lets you view the version and state of the filesets currently installed. You can also use this mode to view history information for filesets. When the platform is running in split-mode, only read-only mode is available on the SYSOLD side while SYSNEW is upgraded. SWIM is available to the maintenance user in read-only mode.

  Note: The Fixes level is not accessible in read-only mode.

- full-function mode lets you use all of the SWIM functions; however, you must be a root user. When the system is running in split-mode, the full-function mode is available on the SYSNEW side only.

Log Delivery Application overview

Functional description

The Log Delivery Application consists of a group of application filesets that run on the CS 2000 Core Manager. The following table describes the application filesets that must be installed for full operation of the Log Delivery Application.

Log Delivery Application filesets

Fileset	Description
Log delivery service (SDM_BASE.logs)	Collects logs generated by the CS 2000 Core Manager, the computing module on the call server, and other network elements, and delivers them to operational support systems (OSS). It includes the *logquery* and *logroute* tools.
Log delivery service client (SDM_BASE.logs.client)	Runs on a remote workstation, and includes the *logreceiver* tool.
Generic data delivery (GDD) (SDM_BASE.gdd)	Provides a permanent storage mechanism for logs. (See Generic Data Delivery overview on page 56.)
Nortel Multiservice Switch log streamer (SDM_LOGS.mdm)	Collects Nortel Multiservice Switch logs from the MDM, and delivers them to an OSS. This application fileset is only required for Carrier Voice over IP offices where the CS 2000 Core Manager needs to communicate with the MDM for fault data.

For details about installing the tools and filesets required by the Log Delivery Application, refer to the procedure “Installing and configuring the Log Delivery Application” in the Configuration Management document.

Log Delivery Application tools

The Log Delivery Application in the CS 2000 Core Manager base software platform sends user-defined streams of DMS, CS 2000 Core Manager, and other logs generated by different nodes to a maximum of 30 operations support systems (OSS) and 30 UNIX files on the CS 2000 Core Manager. A maximum of 30 Log Delivery output devices can be commissioned. (The maximum includes the sum of Transmission Control Protocol/Internet Protocol (TCP/IP) links and UNIX files.) The application delivers DMS logs from LogUtil.

Log Delivery provides the tools listed in the following table.

Tools in the Log Delivery Application

Tool	Description
Logquery	Allows you to view logs stored in the generic data delivery (/gdd) directory
Logroute logreceiver	A client application that receives CS 2000 Core Manager logs sent over a TCP/IP connection through the operating company local area network (LAN) for storage and viewing on remote workstations
Logroute log delivery commissioning	Sends logs over a TCP/IP to either a LAN or a UNIX file device; allows you to • view, set, and modify global application parameters, including buffer size, reconnect time-out value, lost logs threshold (number of lost logs before a system log is generated), and ASCII line and log delimiter characters. • delete logs and log types • modify the output device list (parameters, device type, format) • modify incoming log streams from the CM and number of days to store logs in /gdd. Changing the number of days to store logs erases logs older than the number of days specified from /gdd. ***Note:*** Settings changed by the Log Delivery global parameters menu do not affect GDD settings or the logs in /gdd volume.

The logroute log commissioning tool includes an online help facility that provides valid parameter ranges and default values. To route logs from an CS 2000 Core Manager to a workstation, the CS 2000 Core Manager must be configured to send logs to a TCP device with an IP address that matches the IP address of the workstation.

CAUTION

The logroute tool does not have a locking mechanism and must be run by only one user at a time. Otherwise, changes made by one user can overwrite those of another user.

Log formatting

The Log Delivery Application formats logs using Nortel standard (STD) or Switching Control Center 2 (SCC2) format. Formatting can be set for each device.

Log Delivery procedures

The following table includes a list of procedures associated with the Log Delivery Application and tools.

Log Delivery procedures

If you want to	Use procedure
access log devices from a remote location	"Accessing TCP and TCP-IN log devices from a remote location" in the Fault Management document
add a TCP, TCP-IN, or file device	"Configuring a CS 2000 Core Manager for log delivery" in the Configuration Management document
modify parameters for an existing device	"Modifying a log device using logroute" in the Configuration Management document
specify logs to be delivered to a specific device	• for a new device, use "Configuring a CS 2000 Core Manager for log delivery" in the Configuration Management document • for an existing device, use "Modifying a log device using logroute" in the Configuration Management document
delete a log device	"Deleting a device using logroute" in the Configuration Management document
define the set of logs sent from the CM	"Specifying the logs delivered from the CM to the CS 2000 Core Manager" in the Configuration Management document
change the log delivery global parameters (applicable to all devices)	"Configuring the Log Delivery global parameters" in the Configuration Management document
configure the Generic Data Delivery (GDD) parameter	"Configuring GDD parameter using logroute" in the Configuration Management document

Log Delivery procedures

If you want to	Use procedure
display log records	“Displaying or storing log records using logreceiver” in the Fault Management document
install and configure log delivery service	“Installing and configuring the Log Delivery application” in the Configuration document
install and configure the pserver application	Refer to the MDM information for instructions on how to install and configure the pserver application.
install the logreceiver tool	“Installing the logreceiver tool on a client workstation” in the Configuration Management document
view logs	“Retrieving and viewing log records” in the Fault Management document
store logs in a file	“Displaying or storing log records using logreceiver” in the Fault Management document
troubleshoot log delivery problems	“Troubleshooting the Log Delivery problems” in the Fault Management document

Logreceiver overview

Functional description

The logreceiver tool is a client application, included with the Log Delivery Application, that runs on a remote workstation and receives logs sent from a CS 2000 Core Manager through the operating company local area network (LAN). The logreceiver tool can either store these logs in a file or display them on the screen.

To route logs from a CS 2000 Core Manager to a workstation using the logreceiver tool, ensure that

- the logreceiver tool is installed on the workstation. Refer to the procedure “Installing the logreceiver tool” in the Configuration Management document.
- the CS 2000 Core Manager is configured to send logs to a TCP device. Refer to the procedure “Configuring CS 2000 Core Manager for log delivery” in the Configuration Management document.

With the logreceiver tool, you can display logs directly on the workstation screen as they are generated, or store logs in a file. Refer to the procedure “Displaying or storing log records using logreceiver” in the Fault Management document.

Generic Data Delivery overview

Functional description

Generic Data Delivery (GDD) is a permanent storage mechanism that stores the previous 30 days of logs in separate files. Each file contains 12 hours of log activity (00:01 to 12:00 and 12:01 to 24:00). The log files are stored by GDD in the /gdd directory on the datavg volume (rootvg will be used if a datavg volume is not present). Because of the potential for a large number of logs to be generated, proper sizing of the /gdd directory is necessary when commissioning the CS 2000 Core Manager.

Note: At initial commissioning, the default value for the number of days to store logs in the /gdd directory is automatically set to 30.

Set the size of the /gdd directory using the following formula:

(average size of 12-hour log file) x (2 log files per 24-hour period) x (50 days)

Note 1: 50 days is used as an engineering figure to ensure that there is enough capacity for 30 days of logs. Nortel recommends that your initial /gdd volume size be at least 300 Mbytes. This is based on a 3-Mbyte file size for each 12-hour period. The calculation, using the above formula, is: 3 Mbytes x 2 x 50 = 300.

Note 2: Re-size the GDD volume and data volume based on the engineering rules provided in the procedure “Configuring the GDD parameter using logroute” in NN10104-511, *CS 2000 Core Manager Configuration Management*.

When the number of days to store logs limit is reached (maximum=30), the logs are rotated, and the oldest log file is replaced by the newest log file.

To view log files in the /gdd volume, use the log query tool. To configure the number of days to store logs in the /gdd directory, use the logroute tool. For more information about the log query and logroute tools, refer to Tools and utilities on page 30.

Network time protocol overview

Functional description

Network time protocol (NTP) is used to synchronize the internal clocks of various network devices across large, diverse networks to universal standard time. NTP automatically adjusts the time of devices over a period of time so that they are synchronized within a millisecond (ms) on LANs and up to a few tens of milliseconds on WANs, relative to Coordinated Universal Time (UTC).

Network time protocol is commissioned on the CS 2000 Core Manager to make it the time server for the other components or nodes within the network, and can replace the use of DCE's Distributed Time Service (DTS). Refer to the procedure "Commissioning or decommissioning Network Time Protocol (NTP)" in the Configuration Management document.

GR-740 Passthrough overview

Functional description

The GR-740 software application on the CS 2000 Core Manager enables the CS 2000 Core Manager to receive GR-740 compliant messages from and deliver GR-740 compliant messages to a network data collection operations system (NDC OS) on the operating company's LAN/WAN. These messages are received and sent over a TCP/IP link in accordance to GR-740.

The GR-740 software application is installed and removed using the CS 2000 Core Manager Software Inventory Manager (SWIM), and can be configured in DCE mode (secure mode) or in non-DCE mode (insecure mode). To use GR-740 TCP/IP passthrough in secure mode, the Distributed Computing Environment (DCE) server must be installed and configured.

SPM ReachThrough overview

Functional description

The SPM ReachThrough application allows telecommunication transport monitoring and maintenance centers to query the Spectrum Peripheral Module (SPM) for monitored performance parameters on the OC-3 resource module. The feature provides transport network access to the SPM through the CS 2000 Core Manager. A customer Network Element uses Transaction Language 1 (TL1) to retrieve OC-3 performance parameter information from the SPM.

The ReachThrough Surveillance for NA100 SPM feature is optional. SPM ReachThrough includes utilization of current products with existing messaging software to transport TL1 messages between the customer network and the SPM.

Bootp Loading Service Overview

Functional description

The bootp loading service application on the CS 2000 Core Manager allows electronic software loading of multi-service platform (MSP) nodes. This includes initial image loading (IBL), as well as software delivery for regular software upgrade of MSP nodes.

A bootable image resides on the CS 2000 Core Manager in a predefined location and is used to load the MSP nodes at installation time or whenever the initial boot image is required to restart the MSP nodes. Basically, an MSP node sends a bootp request to the CS 2000 Core Manager bootp server. The CS 2000 Core Manager bootp server responds with an acknowledge reply, which contains the MSP node's IP address and loadname. Once the MSP node receives the reply from the CS 2000 Core Manager bootp server, it sends a request to the CS 2000 Core Manager tftp server to begin transfer of the load.

The bootp loading service application is managed using the Software Inventory Manager (SWIM) on the CS 2000 Core Manager.

Routine exercise (REX) test overview

Functional description

The REX test is designed to help detect problems in the system. You can perform the following routine exercise (REX) tests on the CS 2000 Core Manager:

- Ethernet REX
- CPU REX

You can run a specific REX test or all REX tests at any time. It is highly recommended that you run all REX tests prior to performing an upgrade.

When a REX test is invoked, log report SDM630 is generated to indicate the start time. The same log report is generated when a REX test is complete, to indicate the end time. Results from the REX test are recorded in a report stored in the /var/adm directory, which you can view at any time.

Related procedures

Refer to the procedure “Performing a REX test” in the Fault Management document to perform a REX test.

System audit overview

Functional description

A system audit consists of various system pre-checks to ensure all requirements are met before an upgrade is performed. The system audit is set to run automatically on a daily basis at 2 am (default value), and consists of the following checks:

- hardware state and faults (hw command) - ensures that the modules present on the CS 2000 Core Manager are fault-free and have a state of ‘Available’ and ‘online’
- EEPROM status (eeprom command) - ensures that no eeprom problems exist on any of the hardware modules
- AIX LVM - rootvg & datavg (lvm command)
  - ensures that there are no orphaned AIX LVM commands in the process table that could affect integration of an I/O module
  - ensures that all available volume groups are FTVG (fault tolerant) status, fully mirrored and the quorum attribute is set to “no”
  - ensures that all filesystems are mounted with no stale partitions, and that the mount point for each logical volume matches the label
  - ensure that all datavg filesystems are properly created under the datavg volume group in a rootvg/datavg system
  - ensures that all the physical volumes are created and paired, the physical volume identifier of rootvg and datavg physical volumes match the output in lspv (no bogus physical volume identification numbers), and that sufficient disk space is present on the datavg and rootvg volumes
- CPU integrity (cpu command) - verifies that the data associated with a previous split-mode has been flushed, and that the autoboot attribute has been set on the CPUs
- intersystem communication (isc command) - verifies that the intersystem communication (isc) process is not running when split mode is not running

- system resources (sys command)
  - verifies that the “maxuproc” value is set to “500”
  - verifies that the “maxmbuf” value is set to “0”
  - verifies that the “maxpout” value is set to “31”
  - verifies that the “minpout” value is set to “15”
  - verifies that the “cms_notify_meth” value is set to “/sdm/mtce/smm/smm_cms_notify”
  - verifies that the “cms_notify_attr” value is set to “condition,req_condition”
  - verifies that the DAT drive block size is set to “512”
  - verifies that no runaway processes exist
  - checks for excess CPU usage
  - verifies that the appropriate SDM processes are running
  - verifies that the autorestart flag is set to “true”

The system audit is set by default to run all checks automatically on a daily basis at 2 am. You can manually run specific checks or all checks of the system audit at any time. You can change the default time, or you can disable the system audit altogether. It is highly recommended that you keep the default setting and let the system audit run on a daily basis. If you decide to change the time of the system audit, it is recommended that you schedule it during low traffic periods.

The system audit records failures when they exist, but does not resolve the failures. Results from the system audit are recorded in a report, which you can view to determine if any failures need to be resolved.

The system audit is alarmed under the system (sys) level of the maintenance interface. The status of the system audit can be offline (offl) when it is disabled, in service (.), or fail. When the system audit is in a fail state, action is required to resolve the failure. In addition, log SDM550 is generated on the CM, and logs SDM632 and SDM332 are generated on the SDM. For more information on the logs, see “Logs” in the Fault Management document.

Related procedures

Refer to the following procedures in the Fault Management document to perform tasks related to the system audit:

- “Performing a system audit”
- “Viewing the system audit report and taking corrective action”

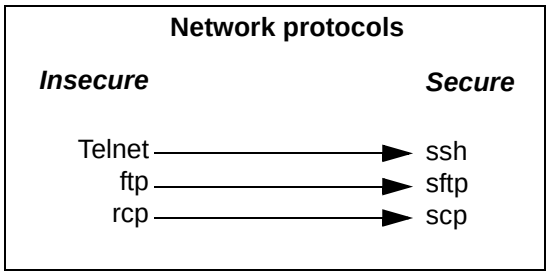
- “Disabling or enabling/changing the time of a system audit”
- “Clearing a system audit alarm”

OpenSSH overview

Functional description

ATTENTION
This document is an overview only of the OpenSSH functionality. Nortel does not provide any detailed usage information or client installation procedures. For this information, refer to the official OpenSSH website located at http://www.openssh.com/.

OpenSSH is an open source version of the Secure Shell (SSH) protocol suite of network connectivity tools. Secure Shell is a program to log into another computer over a network, to execute commands in a remote machine, and to move files from one machine to another. OpenSSH is a suite of tools that provides strong authentication and secure communications over unsecure channels.



The suite of OpenSSH tools is as follows:

- SSH (secure shell) - a replacement for telnet

  Using SSH, you can log in to the core manager from a remote system or log in to a remote system from the core manager. You can also execute commands on a remote system. SSH connects and logs into the specified hostname. You must provide your identity to the remote machine. You can also establish a secure CM session from a remote system through the core manager using SSH.

  Access to some functions requires the use of SSH-compatible client software for access to secure telnet and ftp services (using the SSH standard). SSH clients are bundled with some operating systems, but can to be obtained separately. The following table lists some

sources for SSH clients (sources are not limited to those listed in this table).

Sources for SSH clients

Source	Type
PUTTY	freeware
OpenSSH	freeware
SSH Inc.	commercial
Secure CRT	commercial
WinSCP	freeware

- scp (secure copy) - improved (secure) functionality of rcp (remote copy)

  Using scp, you can securily copy files to and from the core manager or a remote system. Scp uses ssh for data transfer, and uses the same authentication and provides the same security as SSH.

- sftp (secure file transfer program) - a replacement for ftp

  Using sftp, you can perform secure file transfers. Sftp is an interactive program that connects and logs into the specified host, then enters an interactive command mode.

- sshd (OpenSSH SSH daemon) - the server-side daemon

  sshd is the daemon program for SSH. Together these programs provide secure encrypted communications between two hosts over an insecure network.

Note: The functionality of OpenSSH does not interfere with existing networking services, such as telnet, FTP, DCE, NTP, or SFT.

The implementation of OpenSSH on the CS 2000 Core Manager provides three authentication methods:

1 password

2 keys (when you are creating the key, you are asked to add an encrypted password associated with this key)

3 combination of keys and password

The SDM/CBM/CS 2000 Core Manager and the client system administrator must be familiar with the key authentication method, before using it. For detailed instructions on the use of key

authentication, refer to the official OpenSSH website http://www.openssh.com/.

The basic utilities of OpenSSH are:

- ssh-add - adds RSA or DSA identities to the authentication agent
- ssh-agent - authentication agent
- ssh-keygen - authentication key generation, management and conversion
- sftp-server - an sftp server subsystem

For detailed instructions on the use of key authentication, refer to the official OpenSSH website http://www.openssh.com/.

Note: Because the man command is not supported on the SDM, it is not available from SSH shell level.

Related procedures

Refer to the procedure “Installing OpenSSH” in the applicable component Upgrades document to install the OpenSSH fileset.

For additional information, refer to the following web sites:

- http://www.openssh.com/ - for Sun, HP, Linux and AIX
- http://www.chiark.greenend.org.uk/%7Esgtatham/putty/ - a free Win32 Telnet/SSH client for Windows

Core Element Manager (CEM) Store-and-Forward (SAF) services overview

Functional description

The CEM server is an element manager for the DMS node, providing fault, performance, and configuration management toolsets. The server works in conjunction with the CEM browser, which is accessed through the Integrated Element Management System (IEMS).

Three CEM client applications run on the core manager to provide the CEM server with access to core OAM&P data. These applications include:

- CEM Data server
- CEM Telnet Ftp Handler
- CEM Store and Forward

CEM Data Server

The CEM Data Server service provides a conduit between the Call Server (core) and the CEM server for performance and configuration information. This service depends on the base Table Access and OM Access services. The CEM Data Server forwards operational measurements (OM) and configuration data to the performance manager or configuration manager in the CEM server, respectively.

CEM Telnet Ftp Handler

This service provides the pass-through capability for the Call Server (core) terminal access and file transfer components of the CEM server/browser. This allows terminal access and file transfers to the Call Server (core) to be initiated within the CEM server/browser.

CEM Store and Forward

The Store and Forward (SAF) processes are responsible for storing and forwarding operational measurements (OM) and logs from the core manager to the CEM server. This service provides the upstream interface to the CEM server and additional reliability by storing data to handle disruption in communications between the core manager and the CEM server.

Product and customer support

Introduction

The CS 2000 Core Manager component product and customer support includes:

- product support and customer services
- training
- documentation

Product support and customer services

Nortel provides product support using standard Customer Service Center (CSC) and Global Product Support (GPS) policies and procedures. For issues that cannot be resolved, contact Nortel' regional Customer Services Center and a representative will open a Customer Service Report (CSR). If the regional representative cannot resolve the problem, the Customer Service Center representative will refer the matter to the next level of support to provide an answer to the problem or corrective action.

Corrective action can include:

- amendment in a future software release
- incremental software update (patch)
- customer information change
- request for feature development to address new or changed functionality

Once the problem is resolved, the customer is notified and the CSR is closed.

Training

Training is available for the CS 2000 Core Manager component. All course descriptions, prerequisites, schedules and locations can be viewed at www.nortelnetworks.com/td.

Note: For the most recent curriculum information, please contact your Nortel Training and Documentation representative. For enrollment assistance, please contact Training registration at 1-800-4-NORTEL (1-800-466-7835), express routing code #280.

Documentation

Documentation for the CS 2000 Core Manager component is provided on a Helmsman CD. The customer information provided includes overview and upgrades information in addition to the following FCAPS areas:

- faults
- configuration
- administration
- performance
- security and administration