NORTEL

Carrier VoIP

Communication Server 2000
Fault Management

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Contents

Communication Server 2000 Fault Management

The Communication Server 2000 (CS 2000) network element is a composite product composed of principal and auxiliary elements. The principal elements include, and are limited to, the following: the XA-Core, the message switch, the link interface unit (LIU-7) and, in some solutions, the gateway controller (GWC). The auxiliary components are the cabinets that house the principal components and the power supplies that support the principal components.

This document covers fault management on the principal components of CS 2000 network element, with the exception of the GWC component. If your solution includes the GWC, see *Gateway Controller Fault Management* (NN10202-911), for information on fault management on the GWC.

The CS 2000 network element uses routine and preventive maintenance as well as fault clearing to support the reliable functioning of the communication server. Fault clearing is dependent on the timely resolution of alarms. Alarms provide notification of problems or conditions that can change the performance or working state of the CS 2000. CS 2000 daily operation includes monitoring alarms to make sure interruptions in server functionality are kept to the absolute minimum.

New in this release

The following sections detail what's new in *Communication Server 2000 Basics* (NN10448-111) for release (I)SN09U.

- "Features" (page 5)
- "Other changes" (page 7)

Features

See the following sections for information about feature changes:

- "SIP lines support for Malicious Call Hold" (page 6)
- "N12 PRI/ISUP UUI over SCAI" (page 6)

• "Message Waiting Service access using RFC 3842 compliant SIP network and SIP Voicemail System" (page 7)

SIP lines support for Malicious Call Hold

This feature expands to SIP (Session Initiation Protocol) lines the existing Malicious Call Hold (MCH) service supported in the CS 2000 Core. The CS 2000 Core generates a log and records information about the originator of the MCH call. When the terminating agent of the SIP lines initiates the MCH feature, it sends a message with an authorization code to the CS 2000. The CS 2000 then terminates the call and services the request action. For details of CS 2000 logs, see *Carrier Voice over IP Fault Management Logs Reference* (NN10275-509).

N12 PRI/ISUP UUI over SCAI

The PRI User-to-User Signaling (UUS) supplementary service enables a user to send/receive a limited amount of information to/from another user. UUS allows communication of ISDN users by transferring user-to-user information (UUI) within Switch Computer Application Interface (SCAI) call control messages. The UUS service is enabled by datafilling option UUS in table LTDATA.

PRI/ISUP user-to-user information over SCAI   The PRI User-to-User Signaling (UUS) supplementary service enables a user to send/receive a limited amount of information to/from another user. UUS allows communication of ISDN users by transferring user-to-user information (UUI) within call control messages during the establishment of a call. Each message can transfer up to 128 octets of UUI. The UUS option is enabled by datafill in table LTDATA.

Switch Computer Application Interface (SCAI) is a messaging link that the CS 2000 provides to a host computer. The information carried across this X.25/TCP-IP link allows applications running on the CS 2000 to communicate with applications running on the host computer. The SCAI link supports UUI in SCAI19 and later versions.

This feature supports delivery of UUI in the following SCAI messages:

• DV_Call_Received_C

• DV_Call_Queued_U

• DV_Call_Offered_U

To support UUI, the size of outgoing ICM messages is increased from 256 bytes to 512 bytes. If the total size of the outgoing ICM message with UUI exceeds the maximum supported ICM size for X.25 linksets (241 bytes), the UUI is discarded and log SCAI304 is generated. For details of log SCAI304, see *Carrier Voice over IP Fault Management Logs Reference* (NN10275-909).

The UUS service is enabled by datafilling option UUS in table LTDATA. Existing tuples of table SCAISSRV that are present in loads prior to the introduction of this (I)SN09U feature are reformatted to reflect the UUI parameter. For details of tables LTDATA and SCAISSRV, see *Carrier Voice over IP Operational Configuration: Data Schema Reference* (NN10324-509).

Message Waiting Service access using RFC 3842 compliant SIP network and SIP Voicemail System

This feature extends support for the traditional message waiting service to SIP network based lines and RFC 3842 compliant SIP Voicemail System. The service depends on the existing RADVISION stack in the Session Server for SIP lines, and in the gateway controller (GWC) for H.323 lines.

The feature uses tables IPAPPL and MSGRTE. For details of these tables, see *Carrier Voice over IP Operational Configuration: Data Schema Reference* (NN10324-509). The feature introduces three new OM groups in the CS 2000 XA-Core; see *Carrier Voice over IP Performance Management Operational Measurements Reference* (NN10264-709). Logs MNSS115, NMSS116, NMSS117, and NMSS118 are generated if errors occur while sending or receiving messages over SCTP. Logs SCPL100 and SCPL200 are generated when the status of the NCAS link changes. For details of these logs, see *Carrier Voice over IP Fault Management Logs Reference* (NN10275-909).

Other changes

See the following list for information about changes that are not feature-related:

- The CS 2000 generates logs BOOT200, BOOT201, ESA120, and ESA121. These logs were implemented in previous releases but omitted from the component documentation.

Fault-management strategy

The CS 2000 uses self-testing, automatic diagnostics, and alarm reporting to support the maintenance and correct functioning of the server. These built-in systems raise alarms when the following types of hardware or software events occur:

- a fault or failure is detected

- a fault or failure is corrected

- a threshold is crossed and the CS 2000:

    — is operating at a degraded level

    — has reached a defined capacity level

- a condition occurs that is transient or cannot be repaired

Equipment alarms and alarm severity codes indicate the impact of such events on the network element. There are three levels of alarm severity, namely:

- critical alarms

- major alarms

- minor alarms

Critical alarms

A critical alarm indicates a reduced service condition or complete loss of service. In such a condition, the system can no longer perform its design function. This alarm condition requires immediate corrective action to restore system performance to its design function.

Major alarms

A major alarm indicates lost redundancy. Another similar fault can cause the reduction or complete loss of service because no backup capability exists.

Minor alarms

A minor alarm indicates a change in condition that does not lead to a degradation in design function

Tools and utilities

The "XA-Core MAP command interface" (page 8), "CS 2000 Core Manager" (page 10), and the "CS 2000 Management Tools" (page 10) support preventive maintenance, routine maintenance and fault clearing procedures.

XA-Core MAP command interface

The XA-Core MAP user interface displays real-time information about the CS 2000. The figure that follows shows the layout of this display.

Layout of an XA-Core MAP display
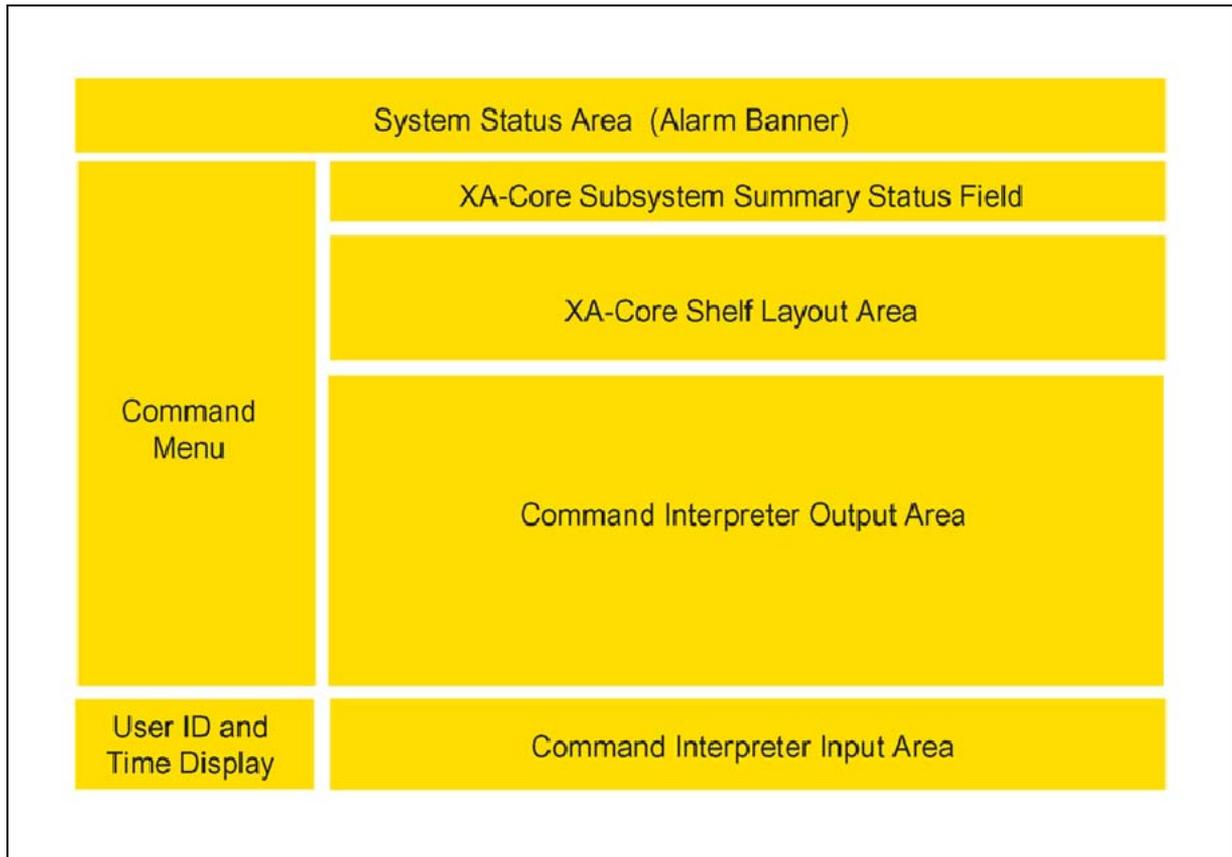
For more information on the XA-Core MAP command interface, see the chapter "XA-Core MAP levels" in *XA-Core Reference Manual*, 297-8991-810.

The command menu, command interpreter output, and command interpreter input areas of the MAP display support software upgrade procedures. Access to the XA-Core MAP levels starts from the command interpreter (CI) of the MAP display through the MAPCI, MTC, and XAC levels. The figure that follows shows the XA-Core MAP level hierarchy.

XA-Core MAP hierarchy
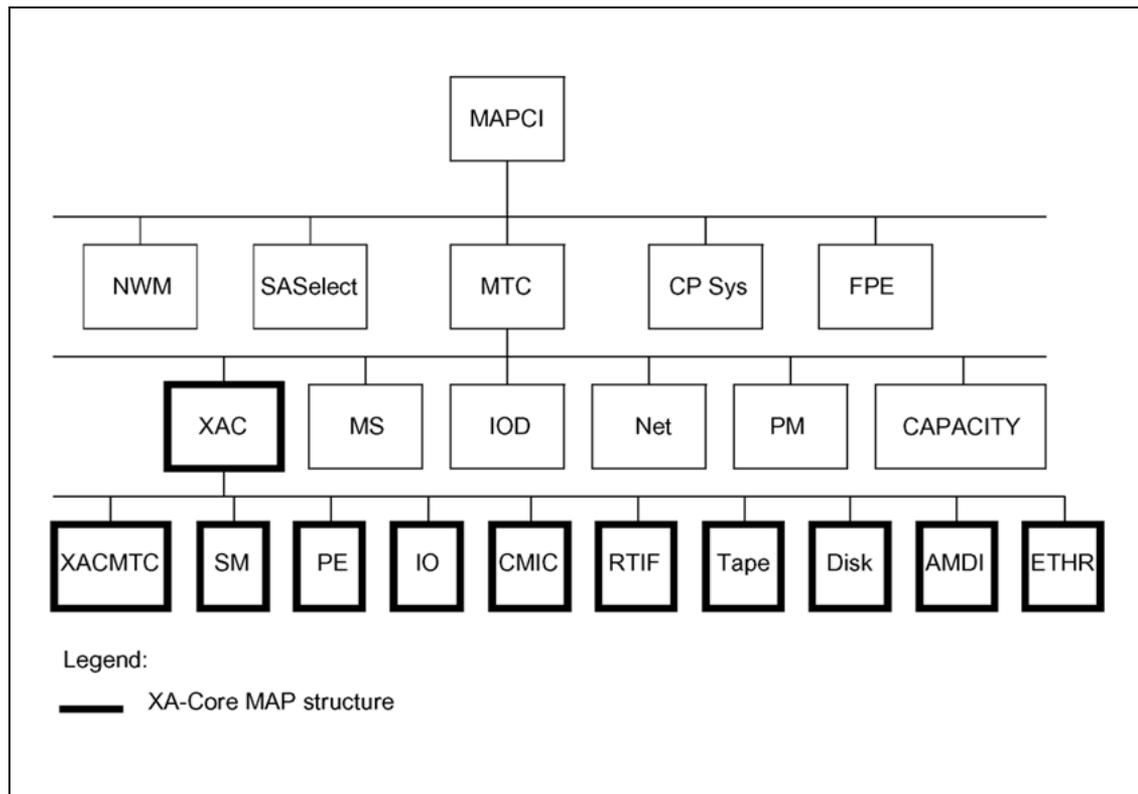
CS 2000 Core Manager

The CS 2000 Core Manager is a separate deliverable that consists of the CS2e software package. For more information about this software package, refer to *CS 2000 Core Manager Basics* (NN10018-111). For information on fault management in the CS 2000 Core manager, refer to *CS 2000 Core Manager Fault Management* (NN10082-911).

CS 2000 Management Tools

CS 2000 Management Tools is a collection (configuration) of products supporting Carrier Voice over IP solutions that use the CS 2000. This set of tools runs on single or multiple servers, or is split to run on different servers. The actual deployment depends on the size of the network and individual customer needs and preferences.

For more information about CS 2000 Management Tools, see the appropriate solution-level document from the following list:

- *PT-AAL2 Solution-level Basics* (NN10441-100)

- *Packet Trunking/Packet Transit - IP Solution-level Basics (PT-IP)* (NN10442-100)

- *UA-AAL1 Solution-level Basics* (NN10443-100)

- *Integrated Access Cable Solution-level Basics (IAC)* (NN10444-100)

- *Integrated Access Wireline Solution-level Basics (IAW)* (NN10445-100)

- *Universal Access - IP Solution-level Basics (UA-IP)* (NN10446-100)

For information on CS 2000 Management Tools fault procedures, refer to *ATM/IP Fault Management* (NN10408-900).

Fault-management procedures

The fault management process relies on alarm surveillance, correlation, and reporting. The following procedures support this process.

- "Retrieving/viewing current alarm details" (page 11)

- "Correlating alarms to isolate trouble" (page 12)

- "Running a manual routine exercise test on the XA-Core" (page 12)

Retrieving/viewing current alarm details

Use this procedure to view the details of active alarms. You specify an alarm name, and the system displays the details of all active alarms that have the specified alarm name. For a list of alarm names, refer to the chapter "Understanding the alarm system" in the *XA-Core Maintenance Manual*, 297-8991-510.

Retrieving/viewing current alarm details

Step	Action

At the MAP terminal

1   Access the XAC level of the MAP display. Type

```
>MAPCI;MTC;XAC
```

and press the Enter key.

The following is a sample MAP display of the XAC level.

```
XAC       MS      IOD     Net     PM      CCS     Lns     Trks    Ext     APPL
 .         .       .       .       .       .       .       .       .       .


XAC                   Front:  111111111  Rear: 111111  SM      PE      IO      PKLT
0 Quit                123456789012345678  456789012345  .       .       .       .
2 Card_       Sta: -.-----..-----.--..-  .---.--------.  0       0       0       0
3 XACMtc      Dep:
4 SM
5 PE
6 IO
7 CMIC
8 RTIF
9 Disk
10 Tape
11 AMDI
12 ETHR
13
14 Alarm_
15 Cntrs_
16
17 Indicat_
18 Query_
```

2   Specify the alarm name. Type

```
>alarm <alarm_name>
```

and press the Enter key

where

`<alarm_name>`   identifies the alarm

Note: For a list of alarm names, refer to the chapter "Understanding the alarm system" in the *XA-Core Maintenance Manual*, 297-8991-510.

For example, to view the alarm details for all active RTIF alarms (critical, major, and minor), type

```
>alarm RTIF
```

and press the Enter key.

3   You have completed this procedure.

—End—

Correlating alarms to isolate trouble

For information on how to correlate logs with alarms to isolate XA-Core faults, refer to section "Alarm, log, and OM relationships" in the chapter "Problem isolation and correction" in*XA-Core Maintenance Manual,* 297-8991-510.

Running a manual routine exercise test on the XA-Core

For information on how to run manual routine exercise (REx) tests that check the XA-Core software and hardware, refer to section "How to perform a manual REx test on an XA-Core" in the chapter "Introduction to trouble locating and clearing procedures" in *XA-Core Maintenance Manual*, 297-8991-510.

Alarm-clearing procedures

For information on how to clear alarms that the XA-Core generates, refer to the chapter "Understanding the alarm system" in *XA-Core Maintenance Manual*, 297-8991-510.

Card-replacement procedures

For information on how to perform replacement procedures on an XA-Core, refer to the chapter "Introduction to card replacement" in *XA-Core Maintenance Manual*, 297-8991-510.

Recovery procedures

The following recovery procedures also support the fault management process:

- "Booting the XA-Core from a reset terminal" (page 13)
- "Performing a warm restart on the XA-Core" (page 13)
- "Performing a cold restart on the XA-Core" (page 13)
- "Performing a reload restart on the XA-Core" (page 13)
- "Recovering from a failure in supplied power" (page 13)

Booting the XA-Core from a reset terminal

For information on how to boot the XA-Core from a reset terminal, refer to section "How to boot an XA-Core in a DMS switch" in the chapter "Introduction to recovery procedures" in *XA-Core Maintenance Manual*, 297-8991-510.

Performing a warm restart on the XA-Core

For information on how to perform a warm restart on the XA-Core, refer to section "How to perform a warm restart on an XA-Core" in the chapter "Introduction to recovery procedures" in *XA-Core Maintenance Manual*, 297-8991-510.

Performing a cold restart on the XA-Core

For information on how to perform the more serious cold restart on the XA-Core, refer to section "How to perform a cold restart on an XA-Core" in the chapter "Introduction to recovery procedures" in *XA-Core Maintenance Manual*, 297-8991-510.

Performing a reload restart on the XA-Core

A reload restart is more serious than a cold restart. For information on how to perform a reload restart on the XA-Core, refer to section "How to perform a reload restart on an XA-Core" in the chapter "Introduction to recovery procedures" in *XA-Core Maintenance Manual*, 297-8991-510.

Recovering from a failure in supplied power

For information on how to recover from a CS 2000 failure due to loss or interruption of A and B dc power feeds from the power distribution center (PDC), refer to section "How to recover a dead XA-Core DMS switch" in the chapter "Introduction to recovery procedures" in *XA-Core Maintenance Manual*, 297-8991-510.

Enabling and disabling alarm notification for XA-Core alarms

Use this procedure to enable and disable alarm notification for XA-Core alarms. To enable or disable alarms, you enter a command and specify an alarm name. The system then enables or disables alarms that have the specified alarm name. For a list of alarm names, refer to the chapter "Understanding the alarm system" in *XA-Core Maintenance Manual*, 297-8991-510.

Note 1: Alarm notification is enabled by default. If alarm notification is enabled, and if an alarm condition exists, the system provides notification by way of the MAP terminal display. For some alarm conditions the system also provides notification by way of warning lights and/or by way of audible alarms

Note 2: If you disable an alarm and then fail to re-enable that alarm, a situation then exists in which the system could run in a degraded state, without issuing an alarm to call attention to the problem.

Enabling and disabling alarm notification for XA-Core alarms

Step	Action

At the MAP terminal

1 Access the XAC level of the MAP display. Type

   >MAPCI;MTC;XAC

  and press the Enter key.

  The following is a sample MAP display of the XAC level.

```
 XAC       MS      IOD    Net     PM     CCS     Lns    Trks    Ext    APPL
  .         .       .      .       .      .       .      .       .      .

XAC                     Front:  111111111  Rear: 111111  SM     PE     IO    PKLT
 0 Quit                 123456789012345678 456789012345   .      .      .      .
 2 Card_          Sta: -.-----..-.----.-..- .--.--------.  0      0      0      0
 3 XACMtc         Dep:
 4 SM
 5 PE
 6 IO
 7 CMIC
 8 RTIF
 9 Disk
10 Tape
11 AMDI
12 ETHR
13
14 Alarm_
15 Cntrs_
16
17 Indicat_
18 Query_
```

2 To disable or enable XA-Core alarms, type

   >alarm <alarm_name> <action>

  and press the Enter key

   where

`<alarm_name>` identifies the alarm

Note: For a list of alarm names, refer to the chapter "Understanding the alarm system" in *XA-Core Maintenance Manual*, 297-8991-510.

where

`<action>` is disable or enable

For example, to disable alarm notification for RTIF alarms (critical, major, and minor), type

`>alarm RTIF disable`

and press the Enter key.

Example of system response:
```
Command Submitted
Alarm Disable completed
Alarm RTIF Disabled
```

3   You have completed this procedure.

—End—

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