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 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 gateway controller (GWC) component. If your solution includes the GWC, see the following document for information on fault management on the GWC: NN10202-911.

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.

Fault-management strategy

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

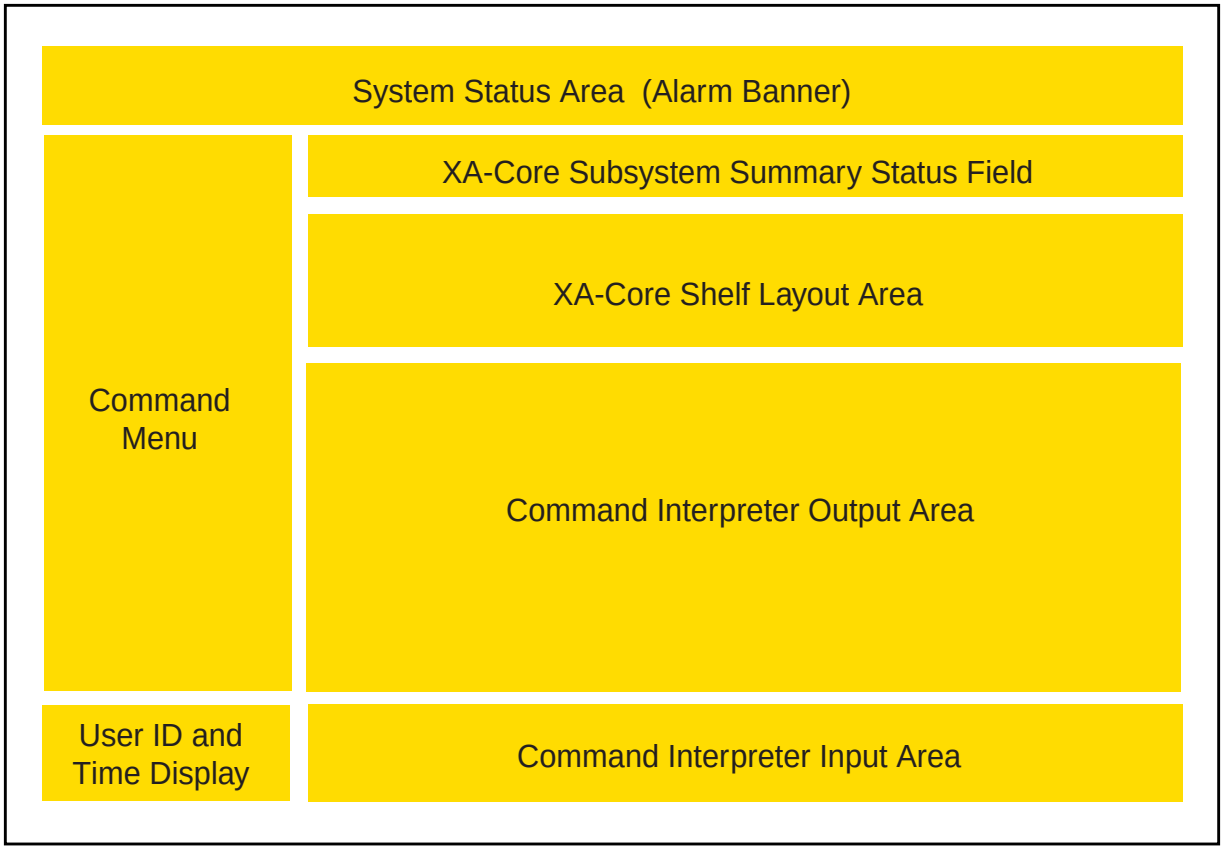
Tools and utilities

The XA-Core MAP command interface, CS 2000 Core Manager, and the CS 2000 Management Tools 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 this display.

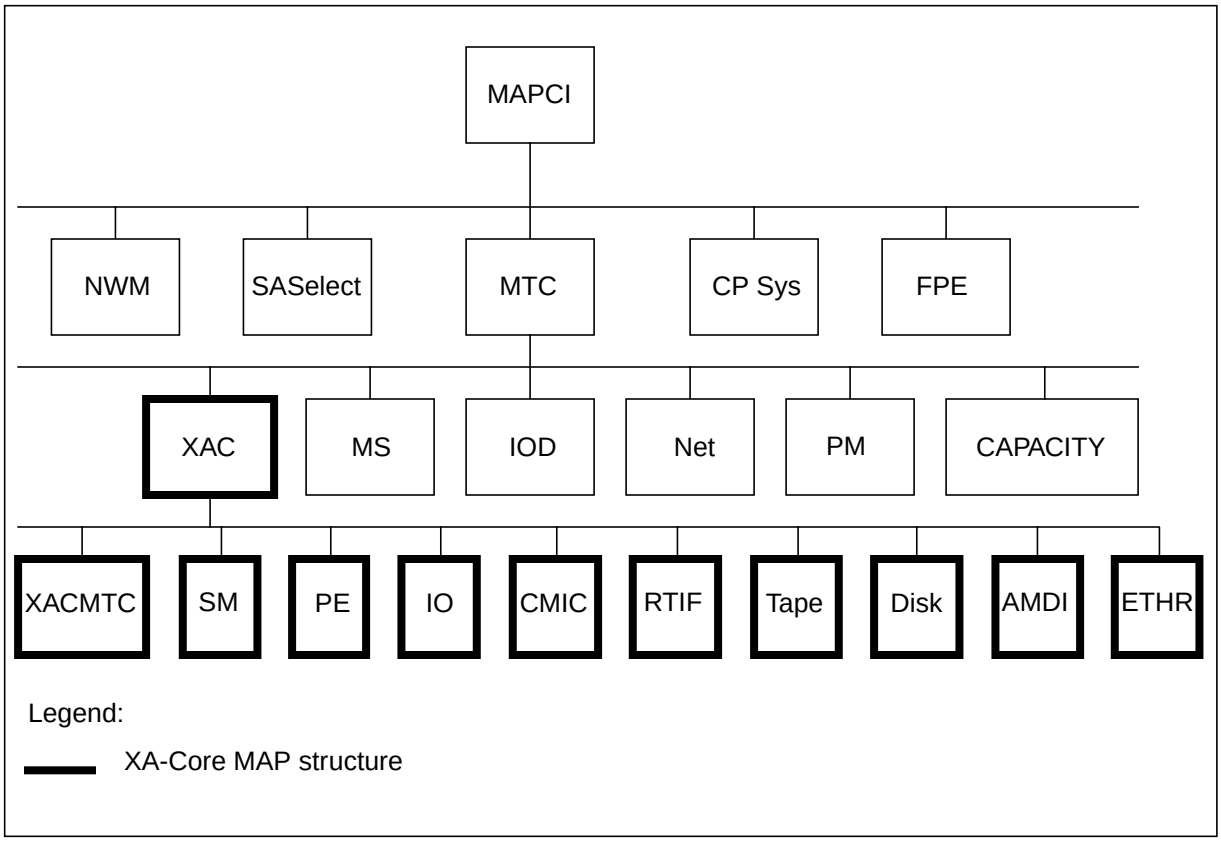
Layout of an XA-Core MAP display



For more information on the XA-Core MAP command interface, see the chapter titled “XA-Core MAP levels” in the *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 the following document: *CS 2000 Core Manager Basics*, NN10018-111. For information on fault management in the CS 2000 Core manager, refer to the following document: *CS 2000 Core Manager Fault Management*, NN10082-911.

CS 2000 Management Tools

CS 2000 Management Tools is a collection (configuration) of products supporting Succession 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, refer to either of the following documents: *IP Solutions Basics*, NN10300-100 or *ATM Solutions Basics*, NN10320-100. For information on CS 2000 Management Tools fault procedures, refer to the following document: *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
- Correlating alarms to isolate trouble
- Running a manual routine exercise test on the XA-Core

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 titled “Understanding the alarm system” in the *XA-Core Maintenance Manual, 297-8991-510.*

Retrieving/viewing current alarm details

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
 0 Quit           Front:    111111111  Rear: 111111   SM     PE     IO     PKLT
 2 Card_          123456789012345678   456789012345   .      .      .      .
 3 XACMtc   Sta:  -.----..-.---.-..-   .--.-------.   0      0      0      0
 4 SM       Dep:
 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 titled "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.

Correlating alarms to isolate trouble

For information on how to correlate logs with alarms to isolate XA-Core faults, refer to the section titled "Alarm, log, and OM relationships" in the chapter titled "Problem isolation and correction" in the *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 the section titled "How to perform a manual REx test on an XA-Core" in the chapter titled "Introduction to trouble locating and clearing procedures" in the *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 titled "Understanding the alarm system" in the *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 titled "Introduction to card replacement" in the *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
- Performing a warm restart on the XA-Core
- Performing a cold restart on the XA-Core
- Performing a reload restart on the XA-Core
- Recovering from a failure in supplied power

Booting the XA-Core from a reset terminal

For information on how to boot the XA-Core from a reset terminal, refer to the section titled “How to boot an XA-Core in a DMS switch” in the chapter titled “Introduction to recovery procedures” in the *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 the section titled “How to perform a warm restart on an XA-Core” in the chapter titled “Introduction to recovery procedures” in the *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 the section titled, “How to perform a cold restart on an XA-Core” in the chapter titled “Introduction to recovery procedures” in the *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 the section titled “How to perform a reload restart on an XA-Core” in the chapter titled “Introduction to recovery procedures” in the *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 the section titled “How to recover a dead XA-Core DMS switch” in the chapter titled “Introduction to recovery procedures” in the *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 titled “Understanding the alarm system” in the *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

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
 0 Quit        Front:   111111111  Rear: 111111   SM     PE      IO     PKLT
 2 Card_       123456789012345678  456789012345   .      .       .      .
 3 XACMtc  Sta: -.-----..-.---.-..-  .--.--------.  0      0       0      0
 4 SM      Dep:
 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 titled "Understanding the alarm system" in the *XA-Core Maintenance Manual*, 297-8991-510.

<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.