



SAM21 Shelf Controller Basics

What's new for SN07

Centrex IP Client Manager (CICM) and CICM Manager are supported application types in a SAM21 shelf.

The software for the SAM21 Shelf Controller is enhanced to reduce memory consumption. Robustness is improved by having each SAM21 Shelf Controller report status to the other unit. In the event that the active unit encounters an error, activity switches to the inactive SAM21 Shelf Controller. If the inactive SAM21 Shelf Controller is degraded, or both units are equally degraded, the active SAM21 Shelf Controller locks and unlocks the inactive SAM21 Shelf Controller. After the unlock, status is reevaluated, and a switch of activity may occur.

If the SAM21 Shelf Controller is configured with an ATM interface, and the office uses Integrated Element Manager System (IEMS), then performance statistics for the ATM interface are available at the IEMS. This requires provisioning the IP address of the server that runs the IEMS application at the CS 2000 SAM21 Manager.

In some cable access markets, the SAM21 shelf offered in an alternating current (AC) configuration to be installed in a customer supplied frame. AC power does not affect the function of the SAM21 Shelf Controllers, Gateway Controllers (GWC), or any other cards in the SAM21 shelf. When deployed in an AC configuration, Nortel Networks recommends using separate circuits to power each shelf input. The PEC code for the AC powered SAM21 shelf is NTRX51NA. The -48 V DC powered shelf has an NTRX51FX PEC.

Information about Cabinetized SAM (CSAM) and C28B cabinets was removed from this document. Since the SN05 release, all SAM21 shelves are housed in PTE2000 frames.

Software on the SAM21 Shelf Controller synchronizes to the primary Network Time Protocol (NTP) server provisioned at the CS 2000 SAM21 Manager client. If the NTP server is on line and available, log reports and alarms are synchronized with the time at the NTP server. The secondary NTP server is not used by the SAM21 Shelf Controllers.

What's new for SN06

After the CS 2000 SAM21 Manager server application is upgraded and migrated to the server that hosts the CS 2000 Management Tools, the CS 2000 SAM21 Manager client application is started from a web browser rather than a console.

Enhancements to fault management have been made in this release. The SAM21 Shelf Controllers now store a copy of many of the bootloads for the cards in the shelf and can bootload those cards over the backplane to reduce dead shelf recovery (DSR) time.

Operational measurements (OM) are available from SAM21 Shelf Controllers with ATM interfaces. The statistics are gathered by the SNMP Poller on the host that provides the CS 2000 Management Tools and interpretation of that data is completed by an OSS tool.

Functional description

Services Application Module 21 (SAM21) shelves are mounted in a Nortel Networks PTE2000 frame. PTE2000 frames have two configurations, the Call Control Frame (CCF), and the SAMF frame. The SAMF frame is deployed with CS 2000 XA-Core switches and can also be deployed with CS 2000 - Compact switches when additional Gateway Controllers (GWC) are needed. CS 2000 - Compact configurations require the CCF.

The SAM21 shelf has 21 chassis slots. The hardware platform for the SAM21 shelf is the Motorola CPX8221 cPCI chassis. Two slots are dedicated for MCP750HA PowerPC (PPC) SAM21 Shelf Controller cards and two for hot swap controllers (HSC).

Two SAM21 Shelf Controllers are required for each shelf. These cards reside in slots 7 and 9 of the SAM21 shelf. The SAM21 Shelf Controllers:

- manage the hardware states of the other cards in the SAM21 shelf
- communicate with the CS 2000 SAM21 Manager to enable administration of cards in the shelf
- forward alarms to the CS 2000 SAM21 Manager related to environmental alarms

- forward alarms to the CS 2000 SAM21 Manager related to the hardware states of the cards in the shelf
- in some Asynchronous Transfer Mode (ATM) networks the SAM21 Shelf Controllers are equipped with an ATM interface to enable Classical IP over ATM (CIPOA) communication between the Gateway Controllers in the SAM21 shelf and media gateways on the ATM network

The active SAM21 Shelf Controller automatically recovers cards in the shelf that experience a software error. The SAM21 Shelf Controller polls the cards in the shelf with a boot audit process to determine if the cards are in-service. If a card is not in-service, firmware on the card attempts a Network Autoboot to restore service. If the Network Autoboot fails, the active SAM21 Shelf Controller initiates an autoboot of the card to restore service. Refer to the *SAM21 Shelf Controller Fault Management*, NN10089-911 for more information.

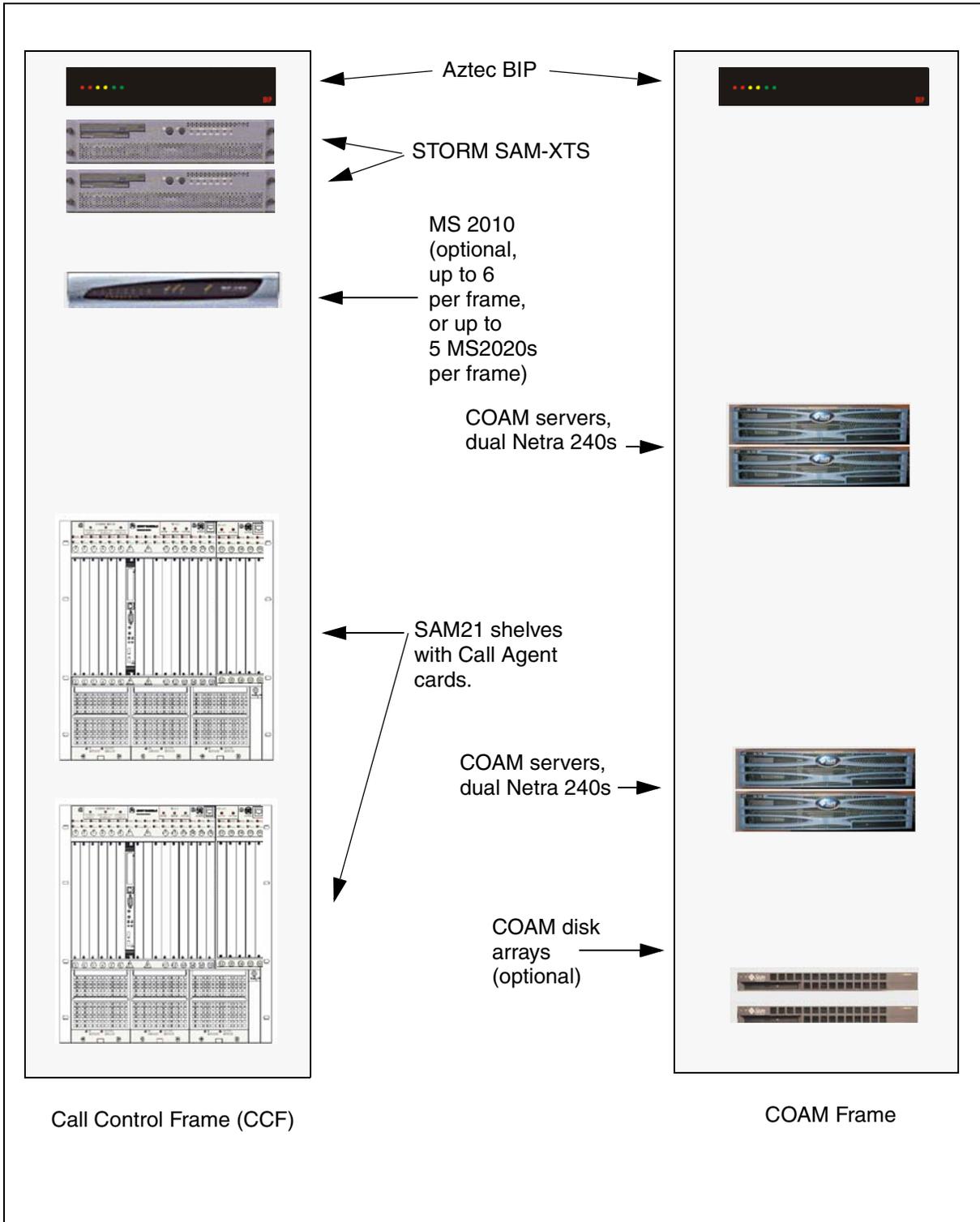
Each card in the shelf stores its own firmware in flash memory. During the software upgrade of each card, the SAM21 Shelf Controller can check if a newer firmware version is available and apply the new firmware on the card. This option is enabled by checking the “FW Flash Enable” checkbox on the Provisioning panel of the CS 2000 SAM21 Manager for each card. For more information, refer to the Upgrades document for the card type. The *SAM21 Platform Base Release Notes* indicate if a firmware upgrade is available for the release.

Note: This document does not discuss the HSC. In the event of a HSC failure or need for replacement, contact Nortel Networks support personnel.

Hardware

Figure [SN07 PTE2000 frame layout](#) shows a block diagram of a Call Control Frame used in the CS 2000 - Compact product, and a SAMF frame used with either a CS 2000 or CS 2000 - Compact.

SN07 PTE2000 frame layout



Tools and utilities

All tools and utilities for the SAM21 Shelf Controllers are provided by the CS 2000 SAM21 Manager. The CS 2000 SAM21 Manager client is a Graphical User Interface (GUI) applet that is started from a Java enabled web browser. The workstation with the web browser is customer supplied. The server application runs on the machine that hosts the CS 2000 Management Tools.

Software

Software loads

The software loadname for the SAM21 Shelf Controller is named `10.x.y.zzzzzzzzzz`

where

10

is the version number for the SN07 release

x

is an integer value for the major version

y

is an integer value for the minor version

zzzzzzzzzz

is an integer value for the maintenance version

Once installed on the CS 2000 Core Manager, the software is labelled as `SAM21 Platform v10`.

Delivery and ordering processes

Software for the SAM21 Shelf Controllers is available by electronic transfer (ESD) or CDROM. The SAM21 Shelf Controller software is delivered as an RPM file to be installed with the `platform_load_install.sh` command on the CS 2000 Management Tools server. The SAM21 Shelf Controller software is then installed on the CS 2000 Core Manager or Core and Billing Manager (CBM). In some markets, the software is installed on the server that provides the CS 2000 Management Tools.

The ordering code for the NCL is SAM20007. The ordering code for MNCL releases is SAM2M007.

Upgrade and patch system

Software upgrade of the SAM21 Shelf Controller is completed through the CS 2000 SAM21 Manager. The SAM21 Shelf Controller software is not patchable.

OAM&P strategy

Operations, administration, maintenance and provisioning for the SAM21 Shelf Controllers is available through the CS 2000 SAM21 Manager client.

Interfaces

Network interfaces and protocols

The network interface to the SAM21 Shelf Controller is a 10/100 Base T interface on the faceplate of the SAM21 Shelf Controller. This interface uses TCP/IP to communicate with other components in the Succession network and to communicate with the CS 2000 SAM21 Manager. BOOTP and TFTP protocols are used on this interface to boot the SAM21 Shelf Controller. SNMP is used to coordinate messages between the SAM21 Shelf Controllers and the CS 2000 SAM21 Manager server.

If the SAM21 Shelf Controllers are configured with ATM interfaces, SNMP is used to report OMs to the SNMP Poller application on the CS 2000 Management Tools server and to the IEMS application, if those applications are available.

User interfaces

The CS 2000 SAM21 Manager provides the user interface to the SAM21 Shelf Controllers.

Many windows for the CS 2000 SAM21 Manager client have a help button. When the help button is clicked, the client application checks the entries in the various fields and provides help text for entries that are incorrect. For example, the following figure is the help text when an attempt is made to reprovise a MAC address for a shelf controller with less than 12 characters.

