Copyright © 2004, Nortel Networks

Call Agent Basics

What's new for SN07

December 2004, Standard 04.02

Both the PCL and NCL software loads for the Call Agent are available for electronic transfer from Nortel Networks to a customer dropbox via Electronic Software Delivery (ESD). ESD applies only to the following loads: CM Core, CCA LINUX, and MC.

September 2004, Preliminary 04.01

In addition to the standard DC powered CS 2000 - Compact, it is also available in an AC powered configuration, NTRX51NZ. The AC equipment is shipped loose and is installed in customer provided 19 inch frames at the customer site. This configuration is available in cable access markets where frame level NEBS compliance is not required.

In the Chinese market, the CS 2000 - Compact is available as a DMS core replacement. In this market, the CS 2000 - Compact can be configured as a time division multiplex (TDM) and packet network hybrid switch. Existing CS 2000 - Compact switches that provide TDM services only can be upgraded to a TDM and packet network hybrid switch.

Sun Microsystems Netra n 240 COAM servers and new COAM frame, NTRX51LA, replace the Sun Microsystems Netra t 1400 and the OAME frame, NTRX51KE.

Nortel Networks Core and Billing Manager (CBM) services deployed on COAM server hardware replaces the Nortel Networks SuperNode Data Manager (SDM).

Media Server 2000 series replaces the Nortel Networks Universal Audio Server (UAS).

Nortel Networks Centrex IP Client Manager (CICM) is added as an optional component for the CS 2000 - Compact.

Nortel Networks Session Server with the SIP Proxy application is added as an optional component for the CS 2000 - Compact.

Contents

Call Agent Basics 1
What's new for SN07 1
December 2004, Standard 04.02 1
September 2004, Preliminary 04.01 1
CS 2000 - Compact overview 4
Packet network connectivity 5
OAM&P strategy 5
Interfaces 6
File system 6
CS 2000 - Compact hardware 7
Call Control Frame (CCF) hardware 11
OAME/COAM frame hardware 17
SAMF frame 18
Environmental specifications 18
Power requirements 19
Environmental tolerances 23
Regulatory compliance 23
Electromagnetic Compatibility (EMC) 23
Product safety 24
CS 2000 - Compact software 25
Upgrade and patch system 27

CS 2000 - Compact overview

The Call Agent is the key component in the Communication Server 2000 - Compact (CS 2000 - Compact). This is where the Call Processing engine resides, along with Nortel Networks vast service and feature set. Two SAM21 shelves house Call Agent cards as well as Gateway Controller cards (GWC). SS7 signaling can be provided by a pair of Universal Signaling Point (USP) - Compact cards in the SAM21 shelves, or a USP deployed in a separate frame.

Use of GWCs provides flexibility when selecting media gateways such as Nortel Networks Packet Voice Gateway (PVG) based on the Multiservice Switch 15000 (MSS 15000) for trunking, Nortel Networks Multiservice Gateway 9000 (MG 9000) for line access, or a number of small analog station gateways (Mediatrix 1124, for example) for line access. GWCs use standards compliant H.248, MGCP, NCS, H.323, SIP-T, and TGCP protocols to allow a broad choice of media gateway devices.

Specific gateways and feature set are determined by the Nortel Networks solution purchased and customer needs. The CS 2000 - Compact is available in the following solutions:

- **Universal Access - IP** — local service access and wireline access
- **Integrated Access Wireline/Integrated Access Cable** — telephone service through cable modem or derived lines device
- **Packet Trunking - IP** — local tandem trunking and toll service access

In addition, the CS 2000 - Compact is available in the Enterprise market as the CS 2100 - Compact with the features available in the Enterprise marketplace. The CS 2000 - Compact is used in the Chinese market as a DMS core replacement and as a TDM and packet network hybrid switch. For Cable customers, the CS 2000 - Compact is available with AC powered components, if NEBS certification of frame configurations is not required for deployment.

Packet network connectivity

The CS 2000 - Compact requires connectivity for call signaling, OAM&P, and in some configurations, bearer path. Two Nortel Networks PassPort 8600 routers provide this Communications Server Local Area Network (CS LAN) connectivity. Each Call Agent card has two Ethernet 10/100 BaseT links, and one link is connected to each CS LAN router. Each card in the SAM21 shelf connects directly to the CS LAN. Cards and equipment with two Ethernet interfaces have two connections, one to each CS LAN router.

OAM&P strategy

The three user interfaces to the Call Agent provide the following functions:

- CS 2000 SAM21 Manager client

  This graphical user interface provides access to platform OAM&P such as platform software load, platform diagnostics, and platform upgrade. Hardware provisioning is also completed through this interface.

- Call Agent Manager

  This menu driven console application provides access to platform alarms, platform performance monitoring, platform logs, platform connectivity, platform patching, and the primary interface for platform functions such as cold Switch of Activity (SWACT), Routine Exercise Test (RExTst), jamming, and synchronization of the call processing application. Access to this interface is provided by a telnet session to the CS 2000 Core Manager or CBM and logging in as user “core0usr” or “core1usr.” The CS 2000 Core Manager or CBM forwards valid logins to these accounts to the Call Agent cards.

- MAP

  The MAP is a menu driven console application that provides access to all call processing functions on the Call Agent. Some of the key areas are alarms, logs, and performance monitoring. Once the Call Agent boots and mounts the NFS file system from the STORM units, maintenance and interaction with the file system is completed through this interface. This interface is accessed by telnetting to the CS 2000 Core Manager or CBM and logging in as user “cmusr.” The CS 2000 Core Manager or CBM forwards a valid login to the call processing application.

Interfaces

The following list indicates the physical interfaces for the Call Agent. The Call Agent Manager handles all maintenance and fault reporting for these interfaces.

- Fast Ethernet 100 BaseT

  Each Call Agent has two Ethernet interfaces. The physical connection is made on the rear transition module in each of the SAM21 shelves and is labelled NET1 and NET2. These Ethernet connections terminate to the two routers that are part of the Communication Server Local Area Network (CS LAN).

- fiber channel

  Each Call Agent has a fiber channel interface on the faceplate of the card. These two interfaces are connected with fiber. The Call Agent uses this interface to copy data between the two Call Agents and maintain synchronization of the call processing application. In the SN05 release, the fiber channel connection was enhanced to provide a backup link (BLnk) for messaging between the two Call Agent cards. The BLnk replaces the serial link used in the SN04 release.

Maintenance and fault monitoring of the Ethernet links and the fiber channel interface is completed through the Call Agent Manager.

File system

For the CS 2000 - Compact, file system storage is provided by two STORage Manager (STORM) units. File system storage is used for the following items:

- billing recording, SBA billing backup
- software load management, AUTODUMP, ITOCCI, PMLOADs
- software patches
- logs, operational measurements, and journal file
- file and volume management tools, DISKUT and DISKADM

The Call Agent cards access files stored on STORM units with the Network File System (NFS) protocol. The Call Agents store files in volumes. Each of these volumes is actually a directory on a STORM unit. Each STORM unit manages the data stored to it with Logical Volume Management (LVM) software so that storage size can be increased while data access remains online. The data stored to a STORM unit is mirrored on the two internal disks in the STORM unit.

CS 2000 - Compact hardware

The Call Agent hardware is a Single Board Computer (SBC) based on commercially available Compact PCI (cPCI) technology that resides in a Services Application Module 21 (SAM21) shelf. Two Call Agent cards and two SAM21 shelves are required for redundancy. Each Call Agent card resides in its own SAM21 shelf.

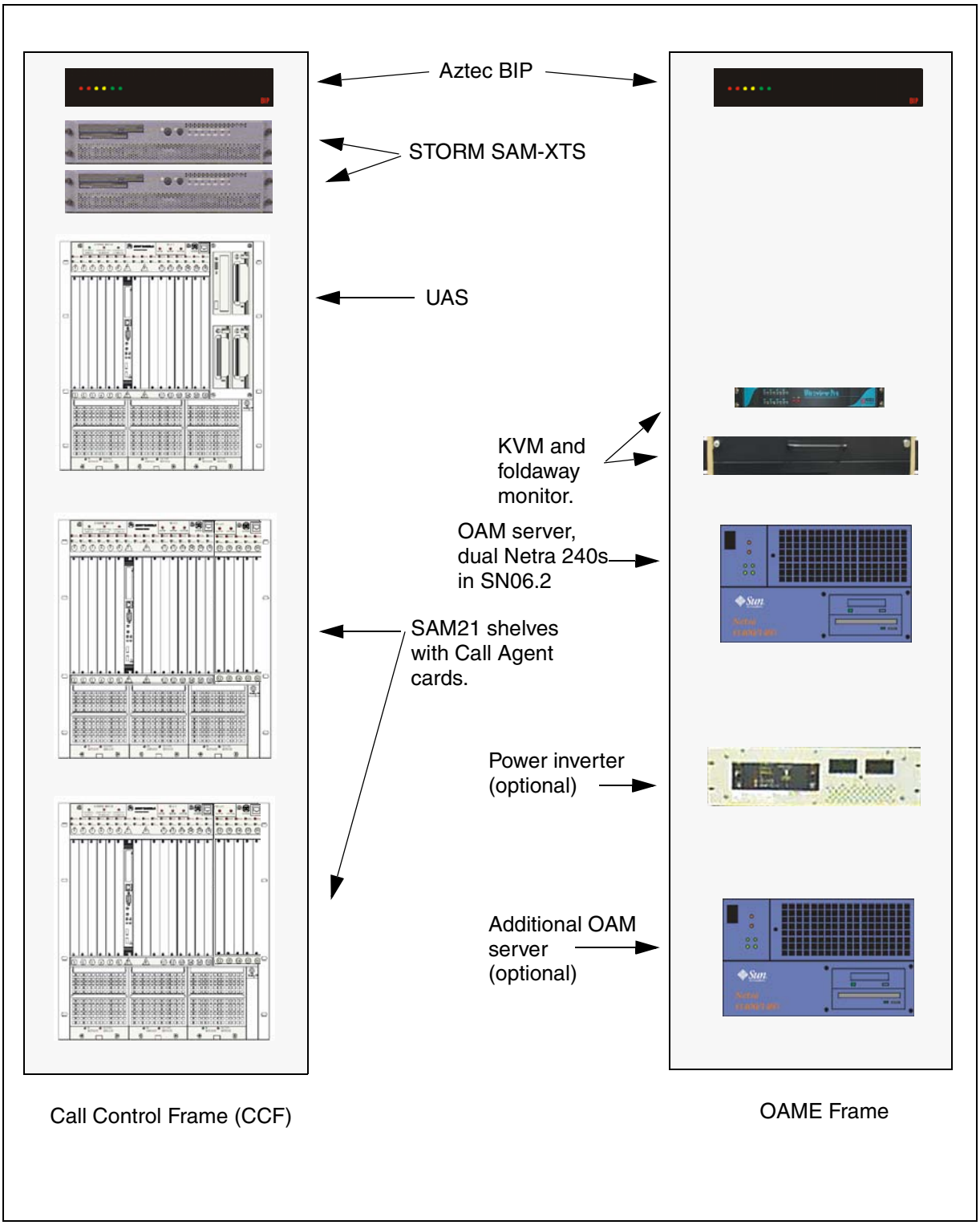
The CS 2000 - Compact product hardware is housed in one Call Control Frame (CCF) and one frame for element management, an OAME or COAM frame. All frames are PTE2000 based and are 7 feet high x 2 feet wide x 2 feet deep with front and rear vented doors and optional side panels. A third extension frame, SAMF, NTRX51HA, is available for added port capacity. The SAMF frame is capable of containing two SAM21 shelves and six Audiocodes Media Servers, or no SAM21 shelves and up to ten Audiocodes Media Servers. When deployed in an AC powered configuration, the CS 2000 - Compact components are shipped loose to be installed in existing 19 inch frames at the customer site. The PEC for the AC version is NTRX51NZ.

Power distribution for DC powered systems is provided by a breaker interface panel (BIP) located at the top of each frame. The BIP distributes A and B power feeds from the customer's power plant to the shelves within the frame. Power distribution for AC powered systems is a customer responsibility though Nortel Networks recommends each component receive two power inputs from separate circuits to improve reliability.

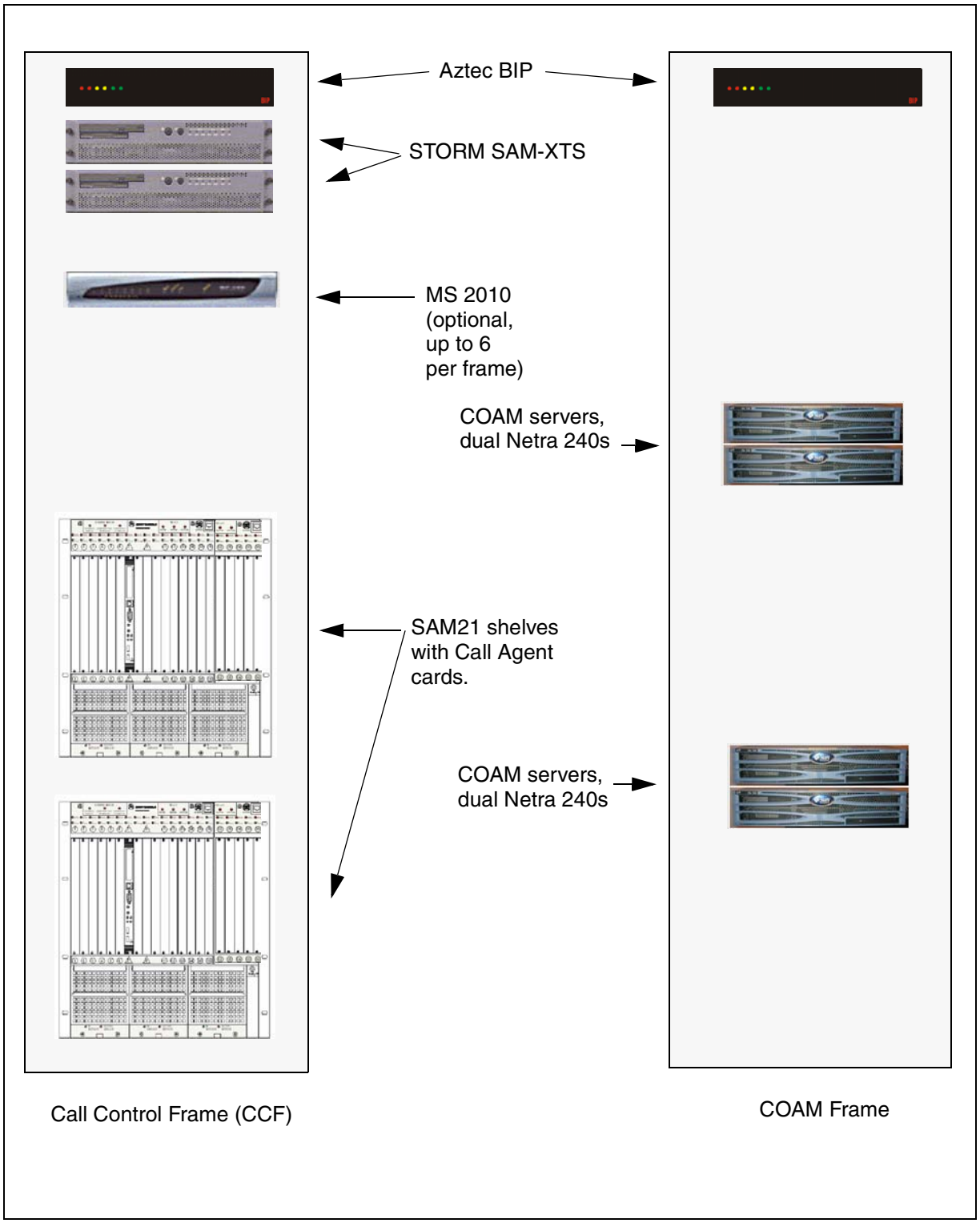
The OAM hardware is located within the OAME or COAM frame. This hardware consists of one Sun Microsystems t 1400 in the OAME frame, or a clustered pair of Sun Microsystems Netra 240s in the COAM frame. The OAME was the shipping baseline for SN06 and previous releases. The COAM frame has been the shipping baseline since the SN06.2 release.The CS 2000 Management Tools software is deployed on the platform to provide element management and various provisioning functions critical to the CS 2000 - Compact. OAME optional equipment includes a KVM switch, foldaway monitor, and additional Sun Microsystems servers. COAM optional equipment includes additional Sun Microsystems servers and disk array storage.

The CS 2000 - Compact is available in the Enterprise market as the CS 2100 - Compact. This configuration is available with two CCFs so that the SAM21 shelves with the Call Agent cards can be distributed geographically, allowing the switch to survive in the event that one of the CCF frames is catastrophically destroyed.

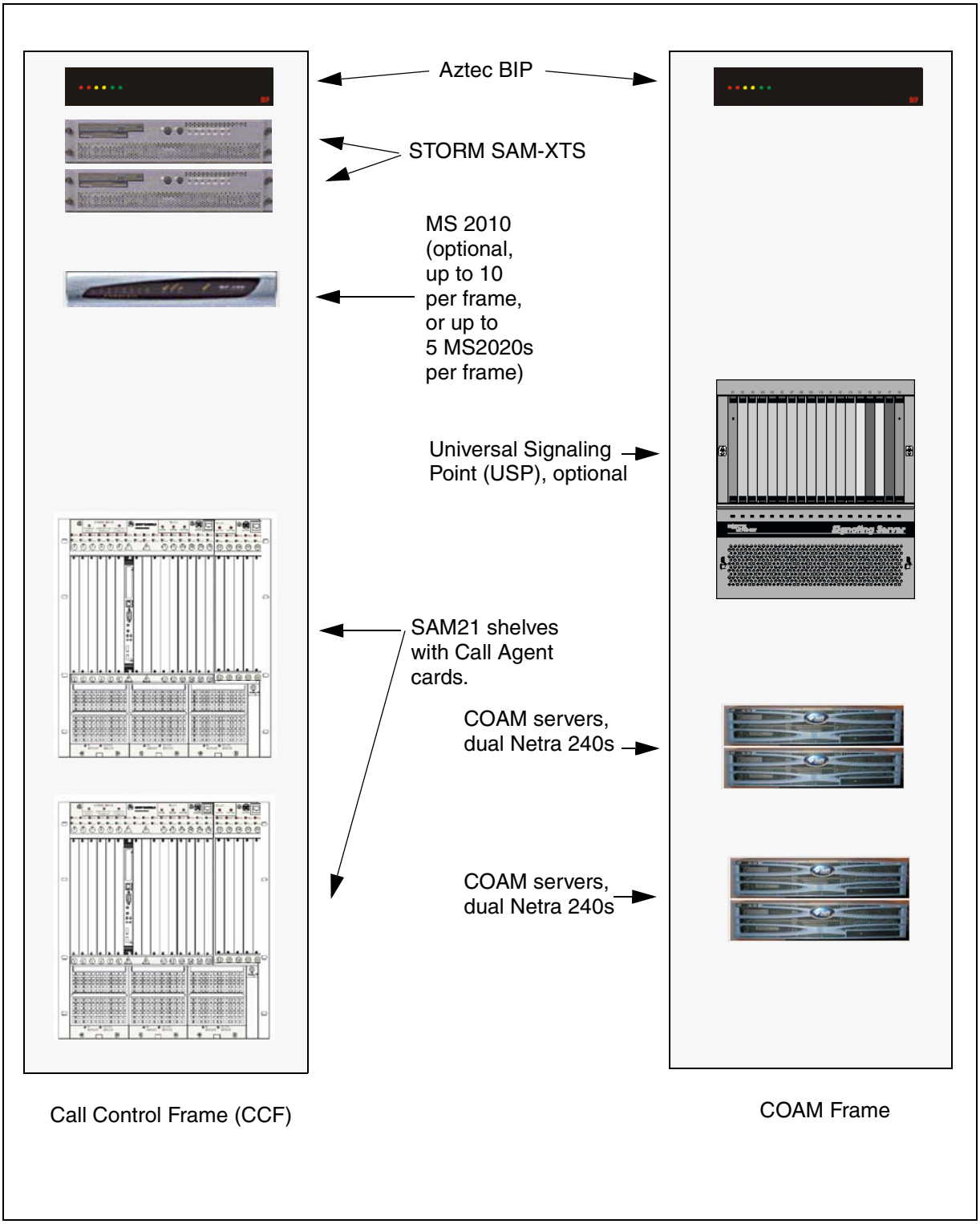
SN06 PTE2000 frame layout



SN06.2 PTE2000 frame layout



SN07 PTE2000 frame layout



Call Control Frame (CCF) hardware

The CS 2000 - Compact is housed in the Call Control Frame (CCF), an OAME or COAM frame, and an optional SAMF frame if additional capacity is needed.

Call Control Frame (CCF)	Status
NTRX51FA	Supported
NTRX51TA	Shipping baseline
The CS2000 - Compact hardware is located within the Call Control Frame. This includes the two STORM SAM-XTS servers and two SAM21 shelves. The SAM21 shelves are equipped with the Call Agent cards, Gateway Controllers (GWC) cards, SAM21 Shelf Controller cards, and optionally a USP-Compact card. Up to 10 MS 2010 chassis or 5 MS 2020 chassis may also reside in the CCF for tones, announcements and Lawful Intercept support.	

Power distribution shelf, BIP	Status
NTRX51HD	Shipping baseline
The Breaker Interface Panel (BIP) occupies the top position in the frame. The BIP has an alarm module and up to four breaker modules. Locations not occupied by a breaker module require a filler module. The alarm module monitors BIP status and has four inputs to monitor shelf level Telco alarm outputs. Front panel LEDs indicate minor, major, and critical alarms. An array of yellow LEDs provides “Follow Me” visual indicator for telephone operating company personnel. The alarm module also provides connections for gathering lineup alarms. Each Breaker Module has an independent DC input power feed and distributes up to five power feeds to shelves within the frame. Breaker Modules are provided in pairs, one for the "A" power feed and one for the "B" feed.	

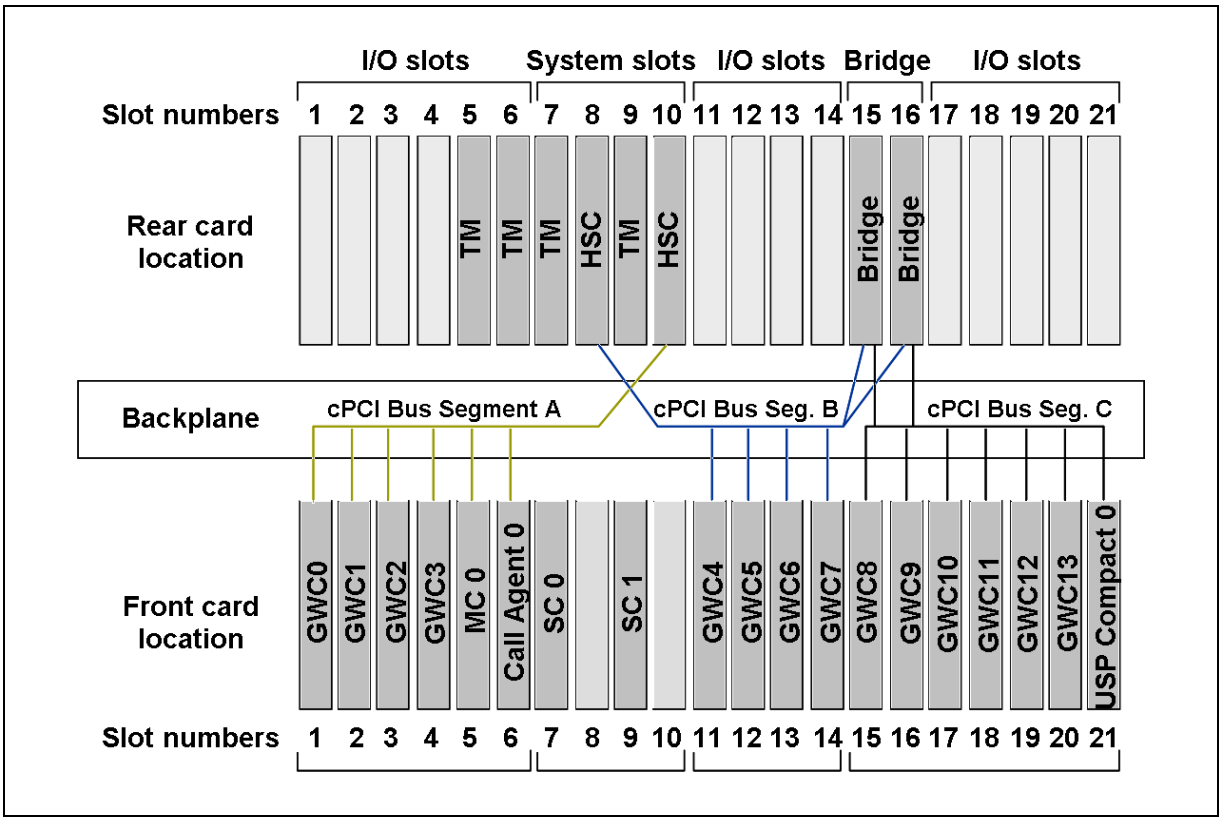
STORage Manager (STORM)	Status
NTRX51FM, STORM cPCI with DotHill disk array	Supported
NTRX51GX, STORM SAM-XTS	Shipping baseline

STORage Manager (STORM)	Status
NTRX51NE, STORM SAM-XTS, AC power	Shipping baseline
The STORM SAM-XTS application provides persistent data storage. Two servers are installed in the CCF directly below the BIP. Each of the two units runs on a 2U NEBS compliant server based on Intel architecture. Each server has a 2+ GHz Pentium 4 Xeon processor and contains two hot swap SCSI disk drives (72 GB). The drives in each unit are mirrored for redundancy. Connectivity to the STORM SAM-XTS is through dual gigabit Ethernet copper interfaces. Each server is connected to both CS LAN routers/switches and the servers are also connected to each other with a pair of NTRX5145 cables.	

SAM21 shelf	Status
NTRX51FX, SAM21 shelf	Shipping baseline
NTRX51NA, SAM21 shelf, AC power	Shipping baseline
The Nortel SAM21 shelf uses Motorola CPX8221 hardware. An alarm panel is at the top of the shelf, above the card slots. The fan and power supplies are located at the bottom of the shelf, below the card slots.	

Packfill depends on the office configuration and customer needs. Figure Slot layout shows packfill for front and rear card locations. The Message Controller in slot 5 is available in some markets that need to support services provided by legacy Peripheral Modules (PM).

Slot layout



SAM21 Shelf Controller	Status
NTRX51FH	Shipping baseline

SAM21 Shelf Controller cards are provisioned in slots 7 and 9 of each CPX8221 shelf. Each SAM21 Shelf Controller card has one 10/100 BaseT Ethernet port. The hardware is a Motorola SMM750HA-1352-F board, model number MCP750HA, with a MPC750 366MHz processor and 128 MB RAM, running Linux PowerPC operating system. Two transition modules, NTRX51FS, are needed for each SAM21 shelf.

Gateway Controller (GWC)	Status
NTRX51BL	Shipping baseline

GWC cards are configured in pairs, one active and one standby. On new installations, the cards are split between the two SAM21 shelves to provide cross shelf sparing. Each GWC card has one 10/100 BaseT Ethernet port. The hardware is a Motorola MCPN750 board, model number MCPN750A, with a 366 MHz processor, 128 MB RAM, and a VRTX operating system. GWCs are not needed for CS 2000 - Compact offices that use TDM peripherals only.

Call Agent	Status
NTRX51FZ - 1.0 GB RAM	Supported
NTRX51GZ - 1.5 GB RAM	Shipping baseline

Two Call Agent cards are used for redundancy, but only one is active at any given time. The cards must be on different shelves. Each Call Agent has two 10/100 BaseT Ethernet ports and a fiber channel interface. The fiber channel link is connected directly to the fiber channel interface on the other Call Agent. If the Call Agent is deployed as part of an Enterprise CS 2100 with geographic survivability, the fiber channel interface is connected to the CS LAN.

The Call Agent card is a Motorola MCPN765 board, with MPC7410 500 MHz processor and 1.5GB RAM, running Nortel Carrier Grade Linux (NCGL) operating system. Ethernet ports are on the rear Transition Module. The fiber channel interface is provided by a Systran fiber channel PCI Mezzanine Card (PMC). An NTRX51FS transition module is needed for each Call Agent card.

Message Controller	Status
NTRX51GY	Shipping baseline until inventory depleted
NTRX51HY	Shipping baseline

Message Controller cards are deployed when connectivity to legacy Peripheral Modules (PM) is needed. The hardware is a Motorola MCPN765 board with a MPC7410 500 MHz processor, 512 MB RAM, two multi-mode ATM PMCs, and two 10/100 BaseT Ethernet ports. The operating system is Nortel Carrier Grade Linux (NCGL). The ATM PMCs are by Interphase 4576-500A. An NTRX51FS transition module is needed for each MC card.

USP - Compact	Status
NTRX51FN	Shipping baseline for T1 interface
NTRX51FJ	Shipping baseline for E1 interface

The USP - Compact provides a cost effective Signaling Gateway function in a small footprint. One USP - Compact system consists of two USP - Compact cards. The cards are located on different shelves within the CCF to increase redundancy. USP - Compact supports a maximum of 16 links and linksets on the two cards. USP - Compact supports channelized T1/E1 SS7 links (4 or 8 channels per card), and IPS7 connections, but does not support m2pa IP High speed SS7 links, ATM based high speed SS7 links, DS0a SS7 links, or V-35 SS7 links.

Centrex IP Client Manager	Status
NTRX51HJ - Processor card	Shipping baseline
NTRX51HK - Transition module	Shipping baseline

CICM provides Centrex IP functionality for the Succession network by exchanging H.248 protocol messages with GWCs. CICM provides the following functionality:

- parses incoming H.248 messages from GWC
- generates outgoing H.248 messages to GWC
- manage call context, including NULL context
- manage physical, ephemeral, and root terminations, including state
- isolates hardware specific details from the H.248 functionality by providing neutral interfaces
- provides QoS reporting

Media Server	Status
Universal Audio Server (UAS)	Supported
MS 2010 - NTRX51JF	Shipping baseline: 120 ports, no conferencing
MS 2010 - NTRX51JG	Shipping baseline: 240 ports, no conferencing

Media Server	Status
MS 2010 - NTRX51JJ	Shipping baseline: 120 ports, conferencing, IP
MS 2010 - NTRX51JK	Shipping baseline: 240 ports, conferencing, IP
MS 2010 - NTRX51JL	Shipping baseline: 240 ports PT-IP solution, no conferencing, IP
MS 2010 - NTRX51NK	Shipping baseline: 120 ports, no conferencing, AC power, IP
MS 2010 - NTRX51NL	Shipping baseline: 240 ports, no conferencing, AC power, IP
MS 2010 - NTRX51NM	Shipping baseline: 120 ports, conferencing, AC power, IP
MS 2010 - NTRX51NN	Shipping baseline: 240 ports, conferencing, AC power, IP
MS 2020 - NTRX51MA	Shipping baseline: 240 ports, no conferencing, ATM
MS 2020 - NTRX51MB	Shipping baseline: 480 ports, no conferencing, ATM
MS 2020 - NTRX51MC	Shipping baseline: 240 ports, conferencing, ATM
MS 2020 - NTRX51MD	Shipping baseline: 480 ports, conferencing, ATM
The rackmount chassis that host the Media Server application are 1U 19-inch for MS 2010, and 2U 19-inch for MS 2020. The processing function in the chassis is provided by the Audiocodes TP. The MS 2000 series is available on the NTRX51TA Call Control Frame and for AC powered CS 2000 - Compact, NTRX51NZ. It is not available for NTRX51FA. It replaces the SAM16 UAS IP solution as of SN06.2.	

OAME/COAM frame hardware

The OAME frame in the SN06 timeframe, or COAM frame in the SN06.2 timeframe contains the hardware required for element management.

Frame	Status
NTRX51KE - OAME	Supported
NTRX51LA - COAM	Shipping baseline

CS 2000 Management Tools server	Status
Sun Microsystems t1400	Supported in NTRX51KE
NTRX51LC - Sun Microsystems Netra 240 with 4 GB RAM	Shipping baseline
With the Netra 240 servers, either two units running in high availability cluster mode or simplex mode may be configured. This server runs management application software such as CS 2000 SAM21 Manager, GWC Manager, QOS Collector Application (QCA), Trunk Maintenance Manager (TMM), Line Maintenance Manager (LMM), and OSS configuration gateway (OSSGATE). In SN06.2 configurations this host can also provide the Audio Provisioning Server (APS).	

Billing Manager	Status
SuperNode Data Manager (SDM)	Available
Core and Billing Manager (CBM)	Available
For SN07 the Core and Billing Manager (CBM) replaces the SuperNode Data Manager (SDM) as the billing and core management system for the CS 2000 - Compact. The CBM is setup in a high availability configuration using two Sun Microsystems Netra 240 servers in the COAM frame. The CBM software consists of the CSEN application load. Note that CBM is NOT supported on the t1400 hardware.	

KVM switch and foldaway monitor	Status
	Supported, no longer shipped
The Keyboard Video Mouse (KVM) switch and one foldaway monitor were provided as part of the SAM16 based Universal Audio Server (UAS). The functionality provided by the UAS is now provided by the Media Server 2000 series.	

Power inverter	Status
	Supported, no longer shipped
The inverter was required to provide AC power to the KVM.	

SAMF frame

The SAMF is an optional frame.

Frame	Status
NTRX51HA	Shipping baseline
Optional SAMF frames are available for added port capacity. Each SAMF can support up to 3 SAM21 shelves, or 2 SAM21 shelves and media servers, six MS 2010s or five MS 2020s. Two Session Server chassis are always provisionable in the SAMF frame, regardless of the number of SAM21 shelves or media servers. Two SAM21 shelves in the SAMF can support up to 16 GWC pairs. The GWC units are split across shelves for extra reliability. CICM application cards may be provisioned in the SAM21 shelves. Up to 15 CICM cards may be provisioned in each SAM21 shelf. Each CICM card requires an NTRX51HM transition module. CICM cards cannot be provisioned in slots 15 or 16 because those slots do not support transition modules.	

Environmental specifications

This section identifies the power requirements, environmental tolerances, and regulatory compliance information.

Power requirements

The power requirements for the CCF, SAMF, and COAM frames are listed below.

Power requirements for CCF, SAMF, and COAM frames

Frame	Equipment	Current draw at -48 VDC (nominal)	Current draw at -41.5 VDC (maximum draw)
CCF (NTRX51TA)	standard configuration with two SAM21 shelves, two STORM SAM-XTS, and two Call Agent cards	18 Amps	21 Amps
	GWC (NTRX51BL)	Add .75 Amps for each GWC pair	Add .9 Amps for each GWC pair
	USP - Compact (NTRX51FJ/FN)	Add .9 Amps for each pair	Add 1.0 Amp for each pair
	CICM (NTRX51HJ) and CICM EM (NTRX51HK)	Add 1.2 Amps for each CICM or CICM EM pair	Add 1.4 Amps for each CICM or CICM EM pair
	Message Controller (NTRX51GY)	Add 1.6 Amps for each pair	Add 1.8 Amps for each pair
	MS 2010 chassis (NTRX51JF/JG/JJ/JK/JL)	Add .9 Amps for each chassis	Add 1.0 Amp for each chassis
SAMF (NTRX51HA)	SAM21 shelf (NTRX51FV)	Add 3.5 Amps for each SAM21 shelf	Add 4.1 Amps for each SAM21 shelf
	GWC (NTRX51BL)	Add .75 Amps for each GWC pair	Add .9 Amps for each GWC pair
	CICM (NTRX51HJ0) and CICM EM (NTRX51HK)	Add 1.2 Amps for each CICM or CICM EM pair	Add 1.4 Amps for each CICM or CICM EM pair
	MS 2010 chassis (NTRX51JF/JG/JJ/JK/JL)	Add .9 Amps for each chassis	Add 1.0 Amp for each chassis
	Session Server (NTRX51HX)	Add 3.0 Amps for each chassis	Add 3.5 Amps for each chassis

Power requirements for CCF, SAMF, and COAM frames

Frame	Equipment	Current draw at -48 VDC (nominal)	Current draw at -41.5 VDC (maximum draw)
COAM (NTRX51LA)	Two Sun Microsystems Netra 240s and an AC inverter, has 4 power feeds rated at 68A. For more than 4 Netra servers, a second BIP and more power feeds are required.	14.5 Amps	
	Sun Microsystems Netra 240, requires 20A breaker	Add 6.0 Amps for each additional server	
	KVM switch	Add .2 Amps VAC from the inverter	
	foldaway monitor	Add .2 Amps VAC from the inverter	
	disk arrays (optional)		

For best AC power redundancy, Nortel Networks recommends a minimum of twelve 15 Amp circuit breakers dedicated to the CS 2000 - Compact. Each circuit breaker should provide power to a single duplex receptacle, for a total of 24 plug in locations. A 15 foot power cable is provided for each power input. Because the cables are 15 feet, receptacles must be within three feet of the frame. Follow the connection strategy below:

AC power circuit and outlet strategy

Equipment	Circuit breaker	Outlet
SAM21 0-A	0	0-0
SAM21 1-A	1	1-0
STORM 0-A	2	2-0
STORM 0-B	3	3-0

AC power circuit and outlet strategy

Equipment	Circuit breaker	Outlet
STORM 1-A	2	2-1
STORM 1-B	3	3-1
Session Server 0-A	4	4-0
Session Server 0-B	5	5-0
Session Server 1-A	4	4-1
Session Server 1-B	5	5-1
MS 2010 0-A	6	6-0
MS 2010 0-B	7	7-0
MS 2010 1-A	6	6-1
MS 2010 1-B	7	7-1
CBM 0-A	8	8-0
CBM 0-B	9	9-0
CBM 1-A	8	8-1
CBM 1-B	9	9-1
CS 2000 MT 0-A	10	10-0
CS 2000 MT 0-B	11	11-0
CS 2000 MT 1-A	10	10-1
CS 2000 MT 1-B	11	11-1
Miscellaneous	12	as required

Power requirements for AC powered equipment

Equipment	Voltage range	Typical current (Amps)	Comment
SAM21 shelf, NTRX51NZ	90-260 V AC, 47-63 Hz	1.8 A at 115 VAC	no cards inserted
		2.02 A at 115 VAC	two SAM21 Shelf Controllers inserted
		2.39 A at 115 VAC	one Message Controller and two SAM21 Shelf Controllers inserted
		0.13 A at 115 VAC	Add 0.13 A for each GWC card inserted.
		0.26 A at 115 VAC	Add 0.26 A for each USP - Compact inserted.
		4.53 A at 115 VAC	fully loaded shelf, two SAM21 Shelf Controllers, one Call Agent, one Message Controller, one USP - Compact, and 14 GWCs
COAM server, Sun Microsystems Netra 240	90-260 VAC, 47-63 Hz	3 A at 115 VAC	3 A for each COAM server
STORM SAM-XTS or Session Server	100-127 VAC, 60 Hz, or 200-240 VAC, 50 Hz	2.5 A at 115 VAC	2.5 A for each chassis
MS 2010	90-260 VAC, 47-63 Hz	0.75 A at 115 VAC	0.75 A for each MS 2010

Environmental tolerances

The environmental specifications for each of the PTE 2000 based frames:

- temperature and humidity
  - — during storage and transportation

    temperature: -40 degrees Celsius to +70 degrees Celsius

    humidity: maximum 95% at 40 degrees Celsius
  - — installed and operational

    temperature: +5 degrees Celsius to +40 degrees Celsius

    short term temperature: -5 degrees Celsius to +50 degrees Celsius for less than 96 hours

    humidity: 5 to 85%

    short term humidity: 5 to 90%, not to exceed 0.024 kg water/kg of dry air
- altitude

  installed and operational: -60 m (-197 ft) to+1800 m (5905 ft) above sea level
- earthquake

  Each frame meets Telecordia Earthquake Zone 4 requirements when installed with appropriate frame anchor kits.
- acoustic

  Each frame meets the Verizon NEBS checklist, SIT.NEBS.TE.NPI.2002.010, limit of 75 dB(A). In addition, the COAM frame meets the GR-63 Core requirement of 60 dB(A).

Regulatory compliance

Electromagnetic Compatibility (EMC)

The CS 2000 - Compact is tested and complies with the following EMC requirements described in the *CMAC Electromagnetic Compatibility Test Plan*, R0000698-TP-EMC-NEBS-01-01:

- radiated emissions
- conducted emissions
- conducted immunity
- radiated immunity
- surge/voltage transients
- electrical fast transient burst

- ESD
- HF voltage dips and sags
- LF voltage dips and sags

The tests cover compliance to Verizon NEBS, AT&T NEDS, and SBC requirements. Contact your Nortel Networks account representative for the compliance of the Centrex IP Client Manager (CICM).

Product safety

The CS 2000 - Compact complies with the following product safety requirements:

- UL 60950
- EN 60950
- GR-1809-CORE Electrical Safety
- CSA C22.2 No. 60950

CS 2000 - Compact software

Call Agent software is divided into three layers:

- platform (non call processing)

  A Linux operating system and maintenance software image is stored on the CS 2000 Core Manager or CBM and loaded by the Call Agent when the Call Agent boots. The software release is available with the **QryLd** command at the Call Agent Manager. Refer to *Call Agent Performance Management*, NN10153-711 for more information.

- virtual machine

  Peel is a Nortel Networks-developed application. This application provides a Protel Environment Emulation Layer (PEEL) that acts as a virtual machine for the call processing application. This software is delivered as part of the platform software.

- call processing application

  Call processing is provided by a Nortel Networks developed core image that operates in the virtual machine. This software is patchable with the Post-Release Software Manager (PRSM) tool available at the Command Interpreter (CI) level of the MAP. The software version is available from the CI with the **IMAGENAME** command.

Operations, Administration, and Maintenance (OAM) of the Call Agent is provided through the Call Agent Manager.

Call Agent Manager

```
 CallAgent      SYS      CON      APPL             Unit: 0
    .            .        .        .

Sys                        Jam:  Link0:  Link1: BLnk: FC: Appl:
 0 Quit      Unit0  Act    no    . Act   . Inact  .    .   insync .
 2 QryCPU    Unit1  Inact  no    . Act   . Inact  .    .   insync .
 3 QryDsk
 4 QryMem
 5 QryZmb
 6 QryNFS
 7 QryLd
 8 QryNTP
 9 QryCpUtl
10
11
12
13 LogQuery
14 Alarm
15 QueryIP
16
17 Help
18 Refresh
  mtc
Time  07:40  >
```

(Software applications and version information)

```
System load report retrieved on Tue May 20 07:40:23 2004:

     Ramdisk: ncgl_cca_image_5.15.1.0
       Linux: 2.4.22 #1 Wed Apr 19 03:03:29 EDT 2004
        Peel: 6.4.48
 Maintenance: 5.0.48
```

Fault management of the call processing application is available at the MAP.

CI level of the MAP

```
2002/08/07 21:22 OFC_CLLI
>IMAGENAME
PPC_3PC_CORE BCS 55 CE built on 2004-APR-12 at 16:51:00 using
csnn07ce
PRODUCT: SNNCSC.007
LOAD: SNC00.007
LAYER: BAS.21.0.CE
LAYER: TL.20.0.CE
LAYER: SHR.20.0.AA
LAYER: CCM.20.0.CE
LAYER: CNA.20.0.CE
LAYER: UCS.20.0.CE
LAYER: TOPSC.20.0.CE
LAYER: CNATOPS.20.0.CE
LAYER: BCTOPS.20.0.CE
LAYER: MSH.20.0.CE
LAYER: SNNCSH.07.0.CE
```

MAPCI level of the MAP

```
MAPCI
 0 Quit
 2 Mtc
 3 SASelect
 4 NWM
 5 CPSys
 6 IBNMEAS
 7
 8 FPE
 9 TESTTOOL
10
11
12
13
14
15
16
17
18
  USERNAME
Time  18:42  >
```

Upgrade and patch system

The platform software is patchable, with the exception of the Linux kernel. Maintenance release (MR) software is delivered by electronic transfer or CDROM. Platform patches are delivered to the electronic dropbox or CS 2000 Core Manager through regional patch selector (RPS). If the office uses a CBM instead of a CS 2000 Core Manager, the patches are delivered to the CBM.

Platform MRs are reprovisioned from the CS 2000 SAM21 Manager client application. A Lock and Unlock request loads the new software. If a firmware upgrade is delivered with the SAM21 platform software load and the FW flash enable checkbox is checked at the Card View window of the CS 2000 SAM21 Manager client, the upgrade firmware is applied during the unlock request. Platform patches are applied through the Call Agent Manager. Refer to the *Upgrading the Call Agent*, NN10065-461 information about platform software patching and the platform software upgrade procedure.

The call processing application software is patchable. This software is patchable through the PRSM in the PRSM level of the MAP. The application is upgraded through Product Computing Module Loads (PCL). Refer to the *Upgrading the Call Agent*, NN10065-461 for information about upgrading the call processing application software. Refer to the *Post-Release Software Manager Reference Manual*, 297-8991-540 for information about call processing application patching.

If a customer prefers having Nortel Networks Software Delivery personnel perform upgrades, contact your account representative and discuss what software services are available in your market.