Smart solutions for smart networks

V33E

CXR iNMS Integrated Network Management System

Features

- User-friendly GUI (Graphical User Interface)
- GUI client runs on Microsoft Windows platform.
- Server software runs on Linux
- Database Server: Oracle 11g/12c
- End-to-end service management
- Fully supports all SNMP functions including commands, alarms, and statistics gathering
- Scalable up to 50 separate GUI clients simultaneously logged into the iNMS server
- Allows viewing and printing of all node statistics and alarm reports
- Configurable report design provides routine and on-demand reports
- Enriched topology management integrated with optional GIS geographic maps
  - Features zoom and drag-and-drop functionality
  - Views of optical cable connection, cross-connection, panel view, and resource trees increase service availability
- Robust and reliable configuration management scales to add additional network elements in distributed system architecture
- Efficient performance monitoring in real-time and history PM data at the NE level and circuit level
- Alarm management provides automatic notification via e-mail, GSM message (SMS), and audio alarms with advanced filtering system
- Root Cause Analysis (RCA) accurately diagnoses faults on NEs and managed circuits by status and severity levels
- System Access Security
  - Role-based user access control.
  - Customizable through any combination of operation functions, geographical locations/areas, and NEs
- Customer support management, advanced circuit diagnostics, and server self-management
- Advanced optional functions include
  - SNMP Northbound Interface (SNMPNBI)
  - Root Cause Analysis (RCA)
  - Clock Distribution Map (CDM)
  - Report Management Generic (RMG)
  - High Availability Real-Time Cluster (HARC) with Real-Time Data Replication and system redundancy
  - Disaster Recovery (DR) for System Redundancy
  - 3rd-Party NE Management (3rdNE)
  - Pseudowire Circuit Management (PWCKT)
  - Circuit Group & Circuit Alarm (CGCA)
  - Circuit-Level Performance (CPERF)
  - DS0 SNCP Circuit Management (DS0SNCP)
  - PDH ULSR Ring Circuit Management (PDHRING)

Description

CXR iNMS (Integrated/Intelligent Network Management System) is a set of intelligent software programs used for providing a Graphical User Interface (GUI) for the management of a communications network containing CXR products. It can be categorized into 3 groups below:

(1) TDM Access, which includes E1 CSU/DSU, HDSL CSU/DSU, and IDSL CSU/DSU
(2) Optical Transmission, which includes SDH/SONET ADM (Add-Drop Multiplex)
(3) IP/Ethernet interfaces

The GUI runs on a user-supplied computer running Microsoft Windows platform. Via LAN or WAN, up to 50 separate GUI clients can be concurrently logged into iNMS.

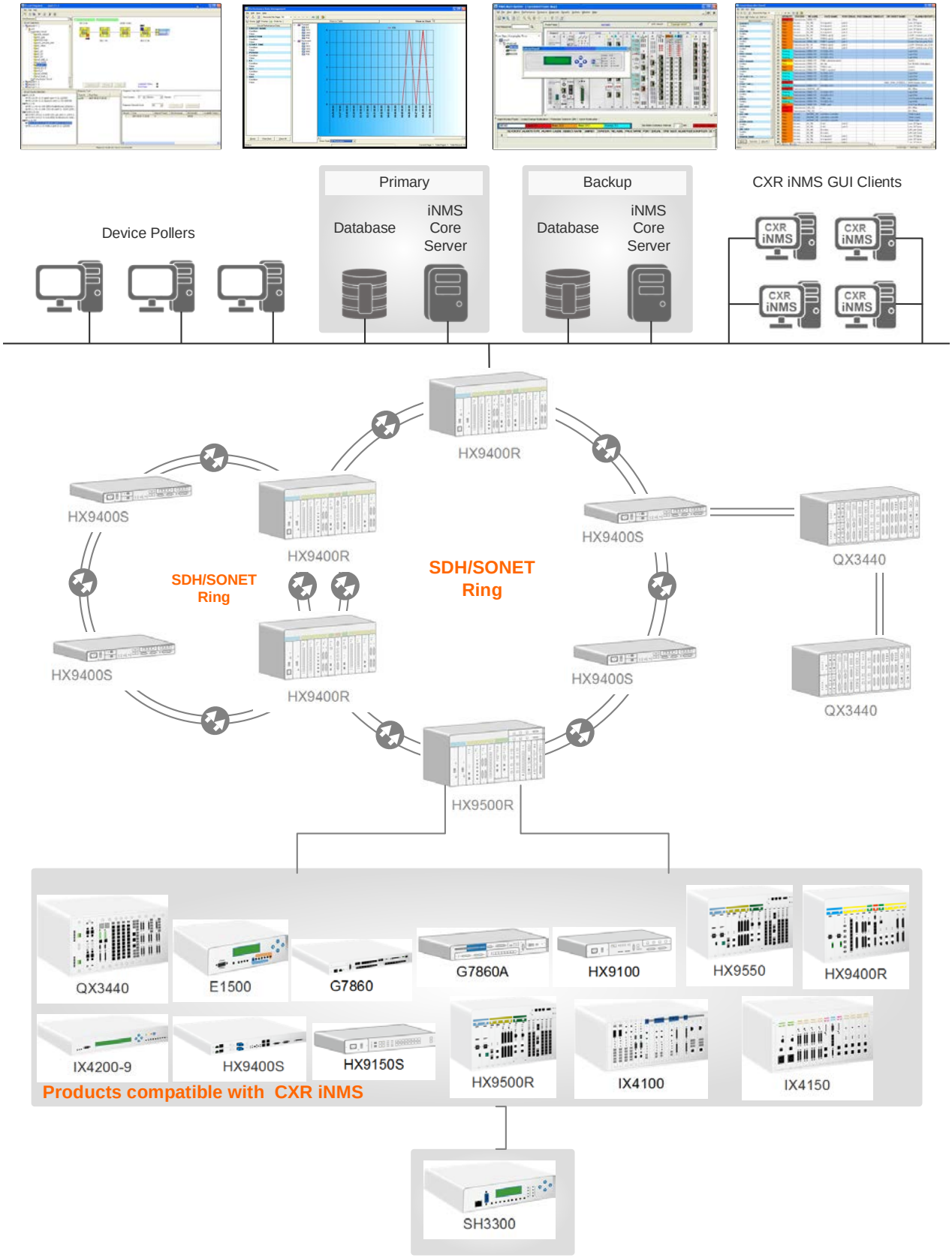
Workforce management is facilitated by multiple levels of login security, which provide the network manager great flexibility in work assignments. The hierarchical grouping featuring cities, buildings, and rooms allows rapid access to the desired network elements.

All SNMP provided functions are available in CXR iNMS. This includes the execution of all commands, the gathering of all statistics, and the display of all alarm conditions in real time. Maps and reports can be printed as well as viewed directly from the iNMS GUI clients.

The support of Southbound Interface with NEs includes SNMP v1, v3, and others upon request. The northbound interface is SNMP based. CXR iNMS is flexibly designed in a way to support nearly all types of southbound and northbound protocol sets. Customization adaptation into different protocols is allowed and is available upon request.

CXR Networks

CXR iNMS Architecture



The CXR iNMS basic components are Device Poller, iNMS core and iNMS GUI Clients as shown in the top part of the diagram. The CXR iNMS is capable of managing all the devices from CXR.

iNMS Main Core

- Runs on Linux/Regular PC server
- Self-sustaining iNMS core is the background engine supporting FCAPS services
- Optional northbound interface engine is an advanced feature available upon request
- Supports TCP/IP socket connections for DPs, iNMS server, Database server, and GUI clients running on different PCs and servers in order to manage a large network when required
- Redundancy option is supported

DP (Device Poller)

- Runs on Linux/Regular PC server
- Manages the southbound interface to the NE using SNMP protocol
- Provides regular polling of the current status of every NE
- Presents all real-time status changes to iNMS GUI client for display
- Supports regular polling of performance data
- Management Protocols supported between NE and DP are SNMPv1 or v3

GUI Clients

- Runs on Windows 2000 Professional, or Windows 7 Professional
- Supports up to 50 concurrent GUI clients

CXR iNMS Basic Functions

Topology Management

- Offers topology view for:
  - Optical cable connection topology
  - Transmission NE connection topology
  - Access NE connection topology
  - PTN (Packet Transmission Network) NE connection topology
  - Entire network NE connections topology
  - Panel view of equipment (NE)
  - Circuit route view
  - NE internal cross-connection
  - Menu tree view
  - Geographical Network topology view
- Supports zooming in and zooming out of topology views
- Allows users to create a desired layout to reflect the actual network
- Offers drag-and-drop approach for a user to create an NE icon

Configuration Management

- Provides configuration collection
- Supports multi-condition queries; adding, deleting, and modifying operations on configuration information stored in the iNMS database
- Supports configuration synchronization
- Provides remote control on NE's configuration
- General parameters setting
- Activation and release of cross-connections
- Synchronization clock-source setting
- Remote download of firmware for upgrading or maintaining NE
- Remote upload and download of NE configuration through iNMS
- Provides NE-level cross-connection configuration

Circuit Management

- Provides circuit management for:
  - Creation
  - Deletion
  - Query
  - Modification
  - Display and Highlight on GUI topology
  - Database commitment for circuit information
- Provides multi-condition queries; adding, deleting, and modifying operations on circuit information stored in the database
- Provides circuit selection options of shortest path, minimum hop, load balancing, and minimal cost
- Provides a list of un-finished fall-back plans for troubleshooting and rescue operations
- ports TDM Circuit rate including:
  - N x 64K
  - E1
  - T1
  - E3
  - DS3
  - STM-1/4 or OC-3/12
  - STM-1/4/16 or OC-3/12/48
  - N x VC12 (N=1 to 63 for Ethernet pipe)/VT15 (N=1 to 84)
  - N x VC3/STS-1 (N=1 to 3 for Ethernet pipe)
  - N x VC4/STS-3 (N=1 to 4 for Ethernet pipe)
- Supports circuit route discovery for existing circuits
- Supports circuit deletion

Alarm Management

- NE alarm/event collection
- Alarm filtering
- Circuit-level alarm
- Alarm display
- Alarm history
- Alarm notification

User & Security Management

- Supports adding, deleting, and modifying operations on user account and a group of users
- Provides operation privileges and scope assignments
- Provides history command log for 3 to 12 months
- Supports multi-condition queries on history command log records
- Supports command log

Diagnosis Management

- Supports three types of diagnosis:
  - NE level diagnosis
  - Circuit level quick diagnosis
  - Circuit level advanced diagnosis
- Supports diagnosis report generation

NE-Level Performance

- Port-based performance task creation, deletion, display and query
- Port-based performance data display, query and report generation in tabular and graphical form. Report can be exported and saved in Microsoft Excel (Microsoft Excel versions 2010 or later).

- Performance counter collection in 15 minute or 24 hour intervals

iNMS Self-management

- Supports real-time monitoring on iNMS software processes
- Supports real-time monitoring on the status of the connections between NEs and DPs
- Supports database backup and recovery
- Supports server disk usage monitoring
- Provides online help for OAM&P operation
- Provides Time & Date Synchronization mechanism between iNMS and NEs

CXR iNMS Advanced Optional Components

SNMP-based Northbound Interface (SNMPNBI)

- Port-based performance task creation, deletion, display and query
- Port-based performance data display, query and report generation in tabular and graphical form. Report can be exported and saved in Microsoft Excel (Microsoft Excel versions 2010 or later).
  Supports SNMP v1/v3 NBI

Report Management Generic (RMG)

- Supports pre-defined & fixed report templates

Root Cause Analysis (RCA)

- User-defined fault policies.
- Root cause analysis based on fault policies

Clock Distribution Map (CDM)

- For TDM Network (both 64k Access and SDH transmission)
- Manual or scheduled clock loop detection

System Redundancy and Protection

- High Availability Real-time Cluster (HARC) Solution
  - Provides geographical system protection with dual iNMS services and an independent system on each site
  - HARC status monitoring
  - Manual and automatic HARC protection switching
  - Real-time data replication automatically for the database of iNMS system
- Disaster Recovery (DR) Solution
  - Provides geographical system protection with dual iNMS services and an independent system on each site
  - DR status monitoring
  - Manual DR protection switching
  - Hourly/Daily data replication automatically for the database of iNMS system

3rd-Party NE Management (3rdNE)

- Manages entire network with one software platform
- Provides capability to manage devices from 3rd-party equipment vendors and CXR devices, which is not fully supported by iNMS
- Shows network element (NE) connectivity and alarm status
- Accesses to telnet and SSH to a NE. Provide URL to bring up 3rd-party equipment web-based management system

Circuit Group & Circuit Alarm (CGCA)

- User-defined circuit group and group category
- Default category for hybrid multi-segment circuit to support TDMoE and conference applications.

- Alarm status monitoring and display by category, group and circuit.

Pseudowire Circuit Management (PWCKT)

- As part of the management solution for CXR pseudowire products to provide emulated Ethernet services over a packet-switching network (PSN).
- Provides CXR TDMoE solution supported by QX3440, HX9500, IMX, SWEDD, including pseudowire resource management.
- Supports CXR PTN solutions.
- Pseudowire circuit sub-module for IP switching based, per UDP number bundling circuit.
- Hybrid circuit sub-module coming with pseudowire circuit management over a PSN network and multi-segments circuit management over TDM and PSN network.

Circuit-Level Performance

- Circuit-based performance task creation, deletion, display and query
- Circuit-based performance data display, query and report generation in tabular and graphical form. Report can be exported and saved in Microsoft Excel (Microsoft Excel versions 2010 or later).
- Performance counter collection in 15 minute or 24 hour intervals

DS0 SNCP Circuit Management

- PDH DS0 SNCP circuit creation, deletion, query, modification and display
- Enable, disable and view PDH SNCP link
- Support quick/advanced diagnosis and diagnosis reports

PDH ULSR Circuit Management

- PDH ULSR circuit creation, deletion, query, modification and display
- Enable, disable and view PDH ULSR link
- Support quick/advanced diagnosis and diagnosis reports

Third-Party Hardware System

Hardware Recommendation table

Note 1: Hardware system shall be provided by SI or end-customer.
Note 2: This recommendation is for reference only. Please consult with a CXR representative for precise hardware spec and quantities.

Item	Mandatory/ Optional	Name	Suggested Model	Remarks
1	M	PC Server with Linux	Small Intel Dual-core PC server (rack mount or standalone) Medium Intel Quad-core PC server (rack mount or standalone)	Used as the CXR iNMS main server if low-cost PC server is preferred.
2	M	Desk-top PC with 22" (or above) LCD and Windows 7 Professional 64-bit	Intel dual-core PC	Used as the CXR iNMS GUI client(s)

PC Server Specifications

Note: This recommendation is for reference only. Please consult with CXR representative for precise hardware spec and quantities.
For project needing more than 100 NEs, please consult with CXR FAE for recommendation.

Item	(Rack Mount) Low Capacity Dell PowerEdge R320	(Rack Mount) Medium Capacity Dell PowerEdge R420	(Tower) Low Capacity Dell PowerEdge T320	(Tower) Medium Capacity Dell PowerEdge R420
Typical Application	Up to 50 NEs*	Up to 100 NEs*	Up to 50 NEs*	Up to 100 NEs*
Processor	1 x Intel® Xeon® E5-2407 4C (2.20GHz or above)	1 x Intel® Xeon® E5-2430 6C (2.20GHz or above)	1 x Intel® Xeon® E5-2403 4C (1.80GHz or above)	1 x Intel® Xeon® E5-2430 6C (2.20GHz or above)
Memory	8GB RDIMM** 1333 MHz	8GB RDIMM** 1333 MHz	8GB RDIMM** 1333 MHz	8GB RDIMM** 1333 MHz
Hard disk	500GB 7.2K SATA 3.5 "	500GB 7.2K SATA 3.5 "	300GB 15K 6Gbps SAS 3.5 "	300GB 15K 6Gbps SAS 3.5 "
DVD R/W	DVD R/W	DVD R/W	DVD R/W	DVD R/W
RAID Controller	Embedded SATA	Embedded SATA	PERC H310	PERC H310
NIC	Dual Port 1GbE	Dual Port 1GbE	Dual Port 1GbE	Dual Port 1GbE
Operating System	Linux / CentOS-6.8 (or RHEL-6.8) 64-bit	Linux / CentOS-6.8 (or RHEL-6.8) 64-bit	Linux / CentOS-6.8 (or RHEL-6.8) 64-bit	Linux / CentOS-6.8 (or RHEL-6.8) 64-bit

* Based on high capacity NE, like QX3440. Dual-Core or 3-Core processor machine is only good for network less than 50 NEs. **It is strongly recommended to separate iNMS application server from Database server to a network with more than 100 nodes.**

** Memory requirement = (4GB system minimum + number of nodes x 8MB) x 1.4

Desktop PC Specifications for GUI client

Item	Desktop PC for GUI Client
Typical Application	For all numbers of NEs
Processor	Intel Core i5 (3.2 GHz) or above
Memory	Memory/8GB DDR3 or above
Hard disk	SSD (Solid State Disk) Flash 128G (500MB/s read, 450MB/s write) or above HardDisk SATA3 500GB/7200rmp or above
DVD R/W	DVD R/W
Sound card & Speaker	Sound interface and Speakers
NIC	10/100/1000M
Graphics	GeForce 600 Series or above
Mouse	USB Wheel or Optical Mouse
Monitor	22” LCD (1024*768) or above
Operating System	Microsoft Windows 10 OS shall be installed inside the SSD above.

Third-Party Software

Item	Name	Mandatory/ Optional	Description	Remarks
1	Microsoft Excel	M	One Microsoft Excel (2010 or later) for each GUI client	MS Excel is required for various report functions on iNMS. The report function will NOT work without MS Excel. (for MS 2010 or later)
2	Oracle Database (To be purchased from CXR as a bundle)	M	(1). Oracle Standard Edition Two (SE2) bundled with CXR iNMS	Applicable to database server up to two processors.
			Or (2). Oracle Enterprise Edition (EE) bundled with CXR iNMS	For database server which has more than four processors and need the advanced features in Oracle database.

Standards

ITU-T M.3100—Generic Network Information Model.
ITU-T M.3200—TMN Management Service: Overview.
ITU-T M.3400—Management Functions

CXR iNMS Ordering Information

To order the CXR iNMS products, you must select **one Main Core** and then the options you require for that Main Core. If you are ordering several Main Cores, they must be ordered individually in separate orders.
Note 1: If you already have a Main Server Software and wish to upgrade it, leave the Main Server Software off of your order form and simply list the option or options you require and provide CXR with the serial number of the iNMS product you have already purchased.

■ iNMS Main

Please select the iNMS Main Server Software if desired. If you're puchasing additional options for an existing network, leave this off of the order form.

iNMS Main Core	Description	Notes
CXR iNMS-Starter-**os**	CXR iNMS Starter Package includes iNMS Main Server Software, built-in NSL-10, and one built-in Oracle SE2 license. The starter package doesn't include hardware servers and installation services. The built-in NSL-10 will allow user to purchase the NE licenses for up to 10. For network size more than 10, please purchase additional NSL from table below to reflect the actual network size of interest.	• The Main software includes below Basic Functions: Alarm monitoring, Configuration, TDM/PW Circuit provisioning, Diagnosis, Performance, and Reports with standard formats. Full version of User's Manual CD (soft copy) included. • The built-in Oracle SE2 can only be licensed on servers with a maximum capacity of two processors. Oracle SE2 license with iNMS-Starter can only apply to one processor. Additional SE2 license is required for a server with two processors. • For Site Redundancy, user needs to purchase additional Starter package for the redundant site.

Where **os** is the Operating System selection (Choose the same Operating System for all **os**)

os =	Description	Notes
Linux	Linux on Intel x86_64 platform	

■ iNMS Network Scale Level (NSL)

Please select the iNMS NSL if additional NSL upgrade is desired.

iNMS NSL	Description	Notes
CXR iNMS-NSL-**nsl**	Please purchase Additional NSL option here to upgrade your iNMS network manageability scale level by the amount of "nsl". The additional "nsl" amount will be added into your NSL ever purchased before. The NSL option is different from the NE licenses. The Network Scale Level (NSL) number defines the maximum total quantity of NE licenses that the user can purchase along the time. While the NE license is referring to a specific NE type and the amount of it to be managed. User CANNOT purchase the NE licenses cumulatively more than the total number of NSL ever purchased.	• Where **"nsl"** is defined in table below. • For Site Redundancy, user needs to purchase additional NSL with the same amount of "nsl" for the redundant site.

Where **nsl** is the Network Scale Level (NSL) selection

nsl =	Description	Notes
5	When this nsl=**5** is purchased, the iNMS Network Scale Level can be upgraded by **5** additionally.	
50	When this nsl=**50** is purchased, the iNMS Network Scale Level can be upgraded by **50** additionally.	
500	When this nsl=**500** is purchased, the iNMS Network Scale Level can be upgraded by **500** additionally.	
5000	When this nsl=**5000** is purchased, the iNMS Network Scale Level can be upgraded by **5000** additionally.	
50000	When this nsl=**50000** is purchased, the iNMS Network Scale Level can be upgraded by **50000** additionally.	

■ iNMS HARC/DR Software

Please Select the Real-time Cluster or Disaster Recovery (Redundancy) Control Software if desired. If HARC/DR is not desired, leave it off of the order form.

iNMS HARC/DR Software	Description	Notes
CXR iNMS-HARC2-**os**	HARC2 (High Availability Real-time Cluster) software license for dual sites with up to **2** physical servers in total. That is the case for the basic configuration of **1+1** server protection. This HARC software is in charge of redundancy status monitoring, database replication, and manual/automatic HARC protection switching.	• To purchase this item, user needs to own/purchase two iNMS Main Server Software beforehand. • **os** is defined in tables below. • Please contact CXR if proposed solution requires more than 6 iNMS physical servers.
CXR iNMS-HARC4-**os**	HARC4 (High Availability Real-time Cluster) software license for dual sites with up to **4** physical servers in total. That is the case for the configuration of **2+2** server protection. This HARC software is in charge of redundancy status monitoring, database replication, and manual/automatic HARC protection switching.	
CXR iNMS-HARC6-**os**	HARC6 (High Availability Real-time Cluster) software license for dual sites with up to **6** physical servers in total. That is the case for the configuration of **3+3** server protection. This HARC software is in charge of redundancy status monitoring, database replication, and manual/automatic HARC protection switching.	
CXR iNMS-HARC1-**os**	HARC1 (High Availability Real-time Cluster) is a software license for adding **1 additional** physical server into existing HARC cluster. That is used only for the case of expansion of the existing physical server farm. Each new physical server requires a license. This HARC software is in charge of redundancy status monitoring, database replication, and manual/automatic HARC protection switching.	
CXR iNMS-DR-**os**	DR (Disaster Recovery) Software license for each physical server. Each physical server requires a license. This DR software is in charge of redundancy status monitoring, database replication, and manual/automatic DR protection switching.	

■ iNMS GUI Clients

Please specify the number of GUI clients you will be serving.

GUI Clients	Description	Notes
CXR iNMS-GUI	Each CXR iNMS GUI client software license, not including Windows OS, MS Excel, Geographical Map, and H/W	• Order from 1 to 50

iNMS Feature Options

Please specify which iNMS types you need. You may choose any or all of the available features.

iNMS Feature	Description	Notes
CXR iNMS-RCA-**os**	CXR iNMS Root Cause Analysis Subsystem	• In case of Site Redundancy, user shall order two licenses for each feature. • Where **os** is defined in tables below. Please notice that Root Cause Analysis (RCA) and Docket Management (DM) Subsystem only support Solaris operation system. • Pseudowire Circuit Management supports TDMoE cards.
CXR iNMS-RMG-**os**	CXR iNMS Report Management Generic Subsystem	
CXR iNMS-DM-**os**	CXR iNMS Docket Management Subsystem	
CXR iNMS-CDM-**os**	CXR iNMS Clock Distribution Map Subsystem	
CXR iNMS-PWCKT-**os**	CXR iNMS Pseudowire Circuit Management Subsystem, including Pseudowire Circuit for TDMoIP, TDMoE and MPLS-TP.	
CXR iNMS-SNMPNBI-v1-**os**	CXR iNMS SNMP v1 Northbound Interface Subsystem	
CXR iNMS-SNMPNBI-v3-**os**	CXR iNMS SNMP v1/v3 Northbound Interface Subsystem	
CXR iNMS-CGCA-**os**	CXR iNMS Circuit Group and Circuit Alarm Subsystem	
CXR iNMS-CPERF-**os**	CXR iNMS Circuit-Level Performance Subsystem	
CXR iNMS-DS0SNCP-**os**	CXR iNMS DS0 SNCP Circuit Management Subsystem	
CXR iNMS-PDHRING-**os**	CXR iNMS PDH ULSR Ring Circuit Management Subsystem	

Where **os** is the Operating System selection (Choose the same Operating System for all **os**)

os =	Description	Notes
Linux	Linux on Intel x86_64 platform	

iNMS NE Management Licenses

The total number of network element (NE) licenses you need is the sum of numbers of NE for each NE type.

iNMS NE License (Devices List)	Description	Notes
CXR iNMS-QX3440	Each QX3440 Major NE management license	• Please specify, for each NE type, the actual number (n) of NEs • Not all the cards for individual NE license are managed by iNMS, for detail, please contact CXR. • Since CXR iNMS Main Server Software will keep evolving to support new plug-in cards and new features, each NE License purchased will not cover those new functions developed after the first purchase of the iNMS main system. If those new functions are needed in the later phases, an NRE charge will be required. • 3rd-party NE is Applicable to CXR and 3rd-party equipments.
CXR iNMS-IMX	Each IMX Major NE management license	
CXR iNMS-SWEDD	Each SWEDD Major NE management license	
CXR iNMS-HX9100	Each HX9100 Major NE management license	
CXR iNMS-HX9400S-1US4	Each HX9400S Major NE management license	
CXR iNMS-HX9400R(CC4)	Each HX9400R Major NE management license	
CXR iNMS-HX9500R(CC4)	Each HX9500R Major NE management license	
CXR iNMS-HX9550	Each HX9550 Major NE management license	
CXR iNMS-3rdNE	Each 3rd-Party NE management license	

Oracle License

Please Select the appropriate Oracle license if desired.

Oracle Edition	Description	Notes
CXR iNMS-Oracle-SE2	Oracle Standard Edition Two (SE2)	1) Include one Oracle Processor metric license 2) Need one license for each processor (socket)

Oracle Edition	Description	Notes
		3) SE2 can only be licensed on a server that has a maximum capacity of two processors (sockets) 3) There is no limit to the number of cores on the servers running SE2, but Oracle Database SE2 automatically restricts usage to a maximum of 16 CPU threads 4) This item can only be ordered for the use with CXR iNMS only, per Oracle ASFU license agreement.
CXR iNMS-Oracle-SE	Oracle Standard Edition (SE)	1) Include one Oracle Processor metric license 2) Need one license for each processor (socket) 3) SE can be licensed on a server with up to 4 processors (sockets) 4) This item can only be ordered for the use with CXR iNMS only, per Oracle ESL license agreement.
CXR iNMS-Oracle-EE	Oracle Enterprise Edition (EE)	1) Include one Oracle Processor metric license 2) For multi-core processor, the number of required EE licenses shall be determined by multiplying the number of processor(s) by the number of core(s) of each processor and times Oracle Core Factor. 3) "Core Factor" specified by "Oracle Processor Core Factor Table" can be found at http://oracle.com/contracts. 4) Good for Database server with more than 4 processors 5) This item can only be ordered for the use with CXR iNMS only, per Oracle ESL license agreement.

■ iNMS Software Maintenance Agreement (SMA)

Purchase of the 1st year SMA is mandatory. Please specify how many **years of iNMS SMA** you desire to purchase. The iNMS software upgrade/patches for bug fixing are only available within the maintenance period purchased.

Note: Software maintenance agreements are available only in yearly basis starting from date of purchase of iNMS. The price quoted for the new SMA applies only before the expiration of the current SMA.

iNMS SMA Type	Description	Notes
CXR iNMS-SMAB	iNMS annual Software Maintenance Agreement (SMA) Bronze including: - Access to software patches/upgrade for bug fixing (not including the new features). - 5x8 (GMT+8) e-mail consulting	• Purchase of the 1st year SMA is mandatory. • Please order the number of years of SMA coverage you wish to purchase. • Customer with existing iNMS running shall reinstate any expired SMAB/SMAS/SMAG/SMAP before making any new order of iNMS software components and services. • New purchase of iNMS components and services will NOT reinstate the expired SMA automatically. • All remote support activities, if purchased, are made possible through remote supporting tools, such as VPN or remote desktop. It's the end customer's responsibility to provide all necessary remote access connections and tools at the customer side. • 5x8 denotes Monday through Friday from 9:00am to 5:00pm (GMT+8) • Access right to the Software Patches/upgrade for bug fixing will not include the right to the latest version with new features.
CXR iNMS-SMAS	iNMS annual Software Maintenance Agreement (SMA) Silver including: - Access to software patches/upgrade for bug fixing (not including the new features). - 5x8 (GMT+8) e-mail consulting - 5x8 real-time (GMT+8) consulting via phone call and IMs (Skype, …) - 5x8 (GMT+8) field problem remote diagnosis - Remote commencement of software patching - Field iNMS Mimic at CXR's Lab	
CXR iNMS-SMAG	iNMS annual Software Maintenance Agreement (SMA) Gold including: - Access to software patches/upgrade for bug fixing (not including the new features). - 7x24 e-mail consulting - 7x24 real-time consulting via phone call and IMs (Skype, …) - 7x24 field problem remote diagnosis - Remote commencement of software patching - Provide quarterly report on iNMS system health checkup including Database Synchronization, Network Alarm Analysis,	

iNMS SMA Type	Description	Notes
	and Server Performance. - Field iNMS Mimic at CXR's Lab	• Since CXR iNMS Software will keep evolving to support new plug-in cards and new features, the SMA purchased will not cover those new functions developed afterward. If those new functions are needed in the later phases, a NRE charge will be required. • The SMA will cover CXR iNMS Software only, and will not cover the problems of Hardware, operation system platform, network condition, and viruses. • For maintenance purposes, the "Field iNMS Mimic" is referring to a Mirror iNMS system constructed at CXR's Lab to mimic customer's iNMS.
CXR iNMS-SMAP	iNMS annual Software Maintenance Agreement (SMA) Platinum including: - Access to software patches/upgrade for bug fixing (not including the new features). - 7x24 e-mail consulting - 7x24 real-time consulting via phone call and IMs (Skype, …) - 7x24 field problem remote diagnosis - Remote commencement of software patching - Provide monthly report on iNMS system health checkup including Database Synchronization, Network Alarm Analysis, and Server Performance. - Field iNMS Mimic at CXR's Lab - Field on-site support for up to two field trips of total 10 working days annually	
CXR iNMS-SMAP-SIOS	iNMS annual Software Maintenance Agreement (SMA) Platinum including: - Access to software patches/upgrade for bug fixing (not including the new features). - 7x24 e-mail consulting - 7x24 real-time consulting via phone call and IMs (Skype, …) - 7x24 field problem remote diagnosis - Remote commencement of software patching - Provide monthly report on iNMS system health checkup including Database Synchronization, Network Alarm Analysis, and Server Performance. - Extended support services for LifeKeeper from SIOS, including a) error correction, b) telephone and email support access and contact information, c) maintenance updates, d) replacement entitlement ID/activation codes. (SIOS LifeKeeper is registered trademarks owned or licensed by SIOS Technology Corp. All rights reserved.) - Field iNMS Mimic at CXR's Lab - Field on-site support for up to two field trips of total 10 working days annually.	
CXR iNMS-RSMA	iNMS annual Reinstatement of SMA (Software Maintenance Agreement)	• If the purchased SMA has expired, you may retain the maintenance service by reinstating your SMA by purchasing RSMA for all prior unpaid year(s), before ordering the SMA for current year. • Customer with existing iNMS running shall reinstate any expired SMA before making any new order of iNMS software components and services.

iNMS Service

CXR iNMS service is available from CXR. **To the service charges quoted below, traveling, food, and lodging cost for the service must be added and will be quoted separately.**

iNMS Type	Description	Notes
CXR iNMS-Site-Install	On-site installation service for iNMS Software by	• Prerequisite: Server Hardware and

iNMS Type	Description	Notes
	CXR engineer.	DCN management channels are ready. • Please order the number of service days you wish to purchase. • 5 working man days per person minimum. (a man day is 8 working man hours) • On-site service charge per person per day in addition to traveling and lodging costs.
CXR iNMS-Site-Training	On-site iNMS training courses including: - Overview of iNMS system - iNMS Security and Administration - iNMS Views - iNMS Topology - iNMS Circuit - iNMS Diagnosis - iNMS Performance - iNMS System Monitor - iNMS Workshop	• Please order the number of training days you wish to purchase. • 3 working man days per person minimum. • Excluding facility, food, and class room preparation for the audiences. • On-site service charge per person per day in addition to traveling and lodging costs, excluding facility, food, and class room preparation for the audiences.
CXR iNMS-Site-Support	Technical On-Site Support services for DCN channel diagnosis, software upgrade, integration, trouble-shooting , network design consulting and testing (such as POC, PAT, and UAT)	• Please order the number of service days you wish to purchase. • 3 working man days per person minimum. • If the SMA (Software Maintenance Agreement) expires, please reinstate it first before you can order this service. • On-site Support service charge per person per day shall add addition traveling and lodging costs.
CXR iNMS-Site-Dedicate	Long-Term Dedicated Engineer On-Site Support	• To be discussed case by case.
CXR iNMS-NP	Network Planning Services including: - New network solution design, - Network expansion planning - Network DCN design.	• Prerequisite: Network diagram and DCN channel plan from operators. • CXR and operators have to work together to produce the final plans. • Please order the number of service days you wish to purchase. • 3 working man days per person minimum. • Conducted at CXR Factory
CXR iNMS-NSD	Network Survey and Diagnosis Services including: - Network Diagnosis - Migration proposal of old NEs into iNMS management - Remedy for incompatibility between NEs version and iNMS version	• To be discussed case by case.

iNMS Type	Description	Notes
CXR iNMS-Factory-Training	Factory iNMS training courses including: - Overview of iNMS system - iNMS Security and Administration - iNMS Views - iNMS Topology - iNMS Circuit - iNMS Diagnosis - iNMS Performance - iNMS Report - iNMS System Monitor - iNMS Workshop	• Please order the number of service days you wish to purchase. • 3 working man days per person minimum. • Conducted at CXR Factory.
CXR iNMS-NRE	NRE charges for special customization per project basis - Special Feature Development - 3rd-Party Equipment Management Integration into iNMS - CORBA North Bound Interface (CORBA NBI) components - Language Support - Customized report - Customized GUI	• Discussed case by case.

Accessories

User's Manual	
CXR iNMS-UM	User's Manual (paper copy). **Note:** A CD version of the manual is already included as standard package.

Ordering Example

Ordered Item	Quantity	Notes
CXR iNMS-Starter-Linux	2	Maximum is 2
CXR iNMS-RC-Linux	2	Each server requires a license
CXR iNMS-GUI	5	Fill in the number of GUI clients required
CXR iNMS-RCA-Linux	2	Each system requires a license
CXR iNMS-CDM-Linux	2	Each system requires a license
CXR iNMS-QX3440	430	NE Management License of 430 QX3440
CXR iNMS-SMAG	1	1 extra year of Software Maintenance Agreement –Gold Package
CXR iNMS-Site-Install	10	10 days of on-site installation service by CXR engineer