

## Elite System EMS Data Sheet

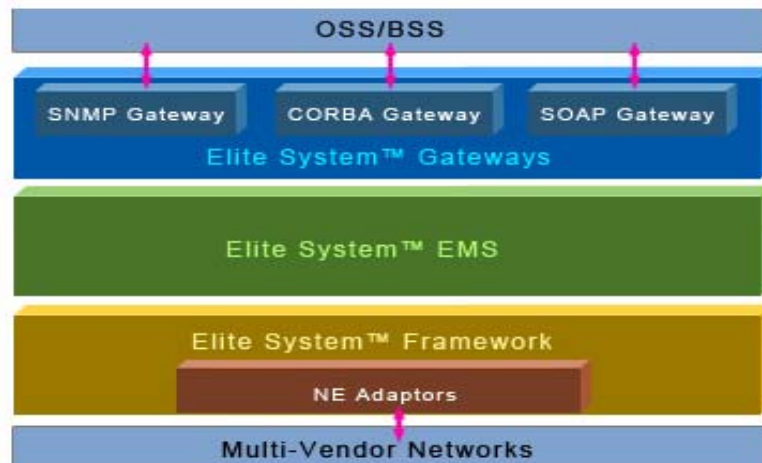
### Introduction

Elite System™ is an industry leading network management framework that enables easy and rapid development of Element and Network Management System (EMS/NMS), Operational Support System (OSS), and other management applications. Network equipment vendors, service providers and system integrators can rely on Elite System™ for rapid development and deployment of any networking management applications with cost effective mode.

The industry leading Elite System™ management platform was developed using the patented XML Metadata technologies and based on over 15 years of providing management software to the word wide network equipment vendors and service providers. The unique architecture and XML Metadata based code generation enables Elitecom to significantly save the development time and cost to deliver the carrier grade EMS and NMS solutions.

Elite System™ product set contains the following three major products:

- ▣ Elite System Framework
- ▣ Elite System EMS
- ▣ Elite System Northbound Gateways



## Elite System EMS Overview

Elite System EMS provides a set of pre-built and off-the-shelf EMS applications on top of Elite System Framework. Elite System EMS delivers a robust feature set designed to simplify and automate everyday operations.

For the first time ever, Elite System EMS brings network equipment vendor the software that they need to manage their complex equipments and networks with simplicity, reliability, security and scalability. The innovative Elite System Framework is at the heart of Elite System EMS, providing the open and scalable software architecture. With the standard based Open Interface, Distributed Architecture, Device Adaptors, Mediation Server, unified Network Discovery capability, and common user interfaces, Elite System EMS brings network service providers a multi-vendor network management applications that reduces the overall operation cost and increase network profitability.

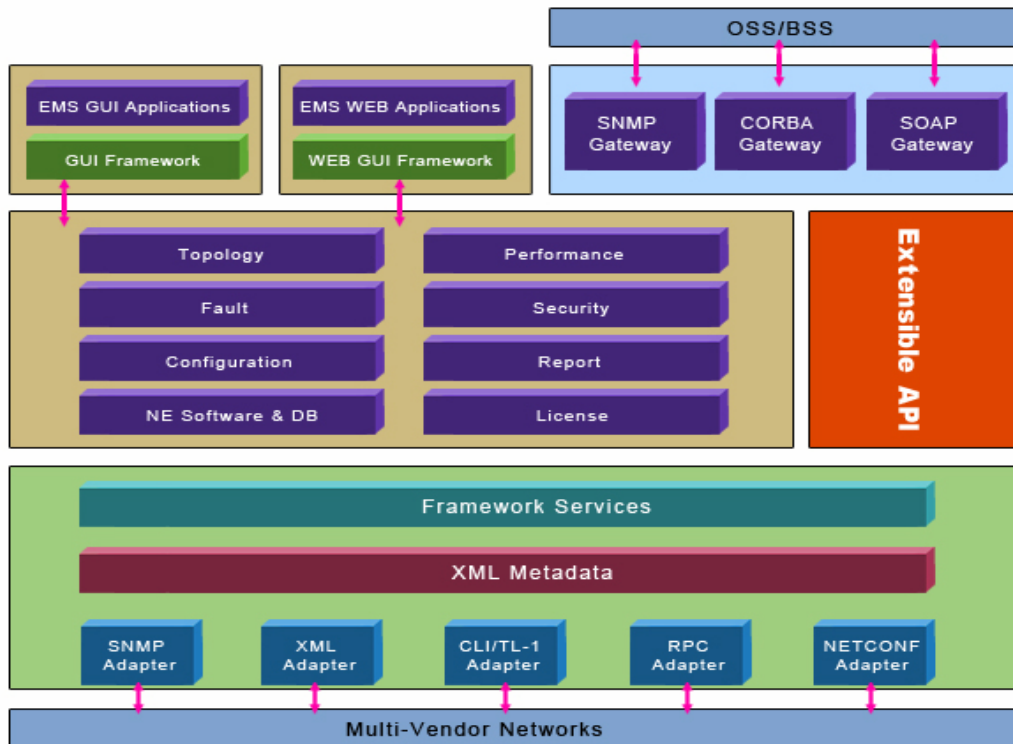
Elite System EMS applications can be used either as the off the shelf, read to use solutions, or serves as the base for customization or extension by integrating with equipment vendor specific hardware technologies. The Elite System is already proven in the production network of top tier service providers with thousands of network elements under management. Elite System EMS has been seamlessly integrated with various standard based OSS applications through Elite System Northbound Gateways.

The powerful and rich set of EMS management functions are offered in Elite System through a set of well defined and easy to use API. Based on vendor specific network equipment information through XML based metadata, scalable, reliable and secure applications can be quickly developed. Vast majority of Java source code in both server and GUI are automatically generated using XML code generation tools. Integration with multi-vendors network equipments is easy and seamless thanks to the wide range of Network Device Adaptors available to almost all network access interfaces.

Elite System EMS application suite provided following pre-built application modules:

- ▣ Topology Management
- ▣ Fault Management
- ▣ Configuration Management
- ▣ NE Software and DB Management
- ▣ Performance Management
- ▣ Security Management
- ▣ Report Management
- ▣ License Management

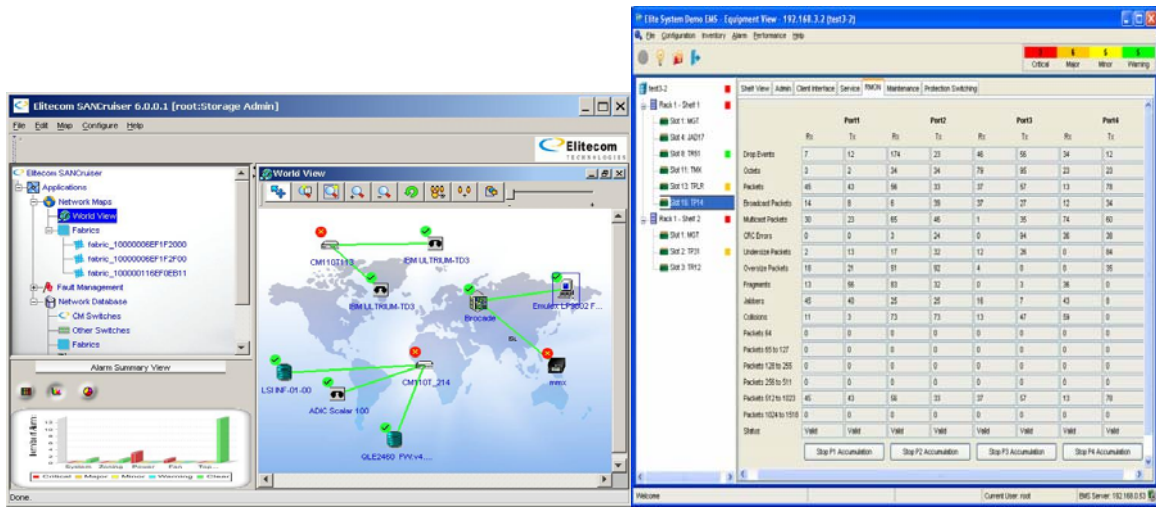




## Highlights:

Elite System EMS provides following differentiators to a traditional EMS:

- ❑ Complete and powerful EMS features to address any network management demand from equipment vendors and service providers.
- ❑ Automatically discovers and tracks changes to network device at real time. Ensures EMS DB always consistent with network at any time. Automatically discovers third party network or storage components such as switches, routers, hosts, etc
- ❑ Intuitive navigation GUI allows efficiency on network configuration and monitoring.
- ❑ Easy to add new device support by plugging Network Device Adaptors
- ❑ Distributed server architecture allows Performance Data Collector to be deployed in different hosts to achieve maximum performance and scalability
- ❑ Automates complex and time consuming provision and network upgrade with easy to use GUI interfaces and batch operations at network level. Allows users to schedule Network Configuration, Image Upgrade, Backup and Restore operations at any future time and as often as they want
- ❑ Applies intelligent validation and audit on hardware and software version before network upgrade to eliminate any incompatibilities. Provides grouping, staging and monitoring to achieve maximum performance on large scale network upgrade.
- ❑ Support alarm propagation, correlation and notifications. Scalable alarm system design enables high alarm/events handling rate.
- ❑ Achieves maximum security through HTTPS, SSL, IPSec, SSH and SNMP V3 support. Integration with Radius and TACCS+ for AAA support.
- ❑ Support lightweight Mediation Server that can be distributed across WAN and behind firewall.



## Elite System EMS Software Specifications

Software Feature	Support
OS	Window XP Window 2000 Window 2003 Linux Redhat 4.0 and 5.0 Solaris 8, 9 and 10
JRE (Java Runtime Environment)	JRE 1.4 (All Editions) JRE 1.5 (All Editions)
Database	Oracle 8,9,10 MySQL 4 and 5
EMS Client	Standalone Java Application Java Application with WebStart Web Client
Web Server	Apache/Tomcat Java Web Server
SNMP	SNMP V1, V2C and V3 SNMP V3 USM and VACM
XML Parser	Any JAXP compliant parser
Installation	InstallAnywhere Install as Service or Daemon option
Upgrade	Step-by-step GUI support Backward Compatible with DB Migration

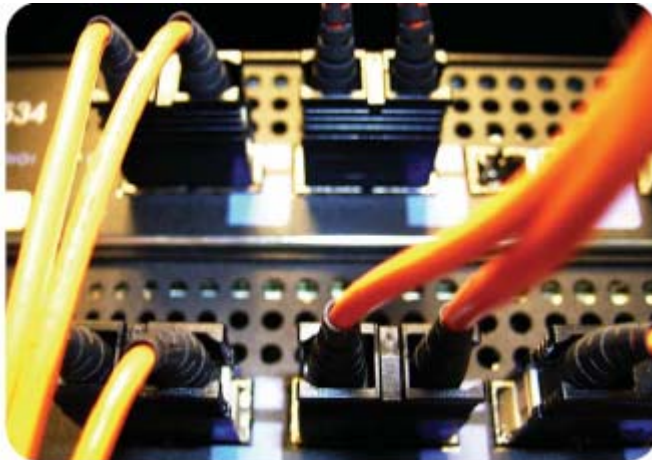
## Elite System EMS Hardware Specifications

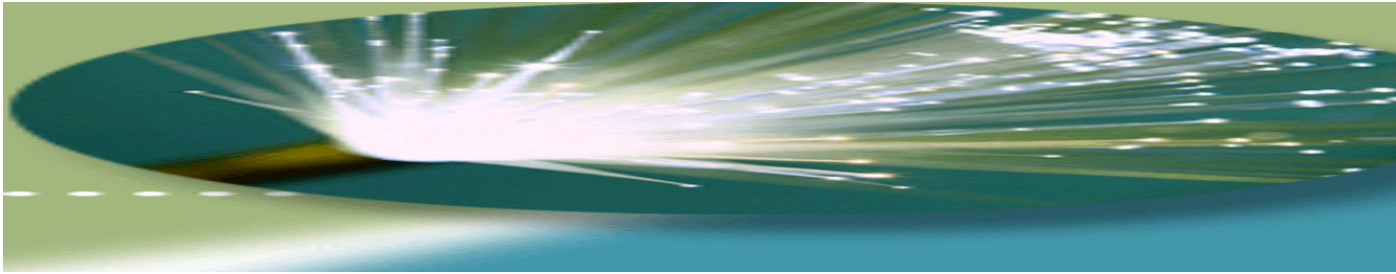
### Elite System EMS server hardware specifications:

Hardware Requirement	Support
CPU	1GHz or above
Memory	1G or above with 512M Swap
Disk	80G or above

### Elite System EMS client hardware specifications:

Hardware Requirement	Support
CPU	800 MHz or above
Memory	512M or above
Disk	10G or above





## Elite System EMS Functional Modules

### Topology Management

Elite System Topology Management application provides multiple hierarchical views for custom graphical representations of the network's topology. It allows network operator to view, monitor and manage the whole network from topological maps by single point and click. It also provides the capability to display NE and Links in a unique set of style and shape to illustrate the status and alarm severity on the nested maps.

#### Features:

Feature	Description
Network Tree	Provide a navigation tree for operator to go through network, subnetwork and network equipment components.
Topology Map	Support and display network topology with maps. Support zoom in, zoom out and navigation functions in map. Display node and link status on the maps with a unique set of style and shape.
Network Hierarchy	Support unlimited levels of network and subnetwork hierarchy, with associated hierarchical and nested maps.
Alarm Status	Display alarms colors and counters on network, subnetwork, node and links.
Alarm Propagation	Support alarm propagation on topology maps.
Third Party Device	Support discovering and displaying third party or unknown network devices. Support receiving and displaying alarms from third party NE.

## Fault Management

Elite System Fault Management application collects alarms and events from NE, propagate alarms, (to the extent possible) automatically isolate and correlate alarms based on predefined rules, and logs them in the DB. It allows users to configure alarms notification through emails, paging, SMS or creation of trouble tickets. The highly scalable design ensures high alarm rate handling and no alarm loss even in alarm storm cases.

### Features:

Feature	Description
Event/Alarm Reporting	Receive and process autonomous events from NE conforming to ITU-T X.733 standard
Events/Alarms Logging	Create Alarm and Event records and log them in DB conforming to ITU-T X.735.
Current Alarm View	Highly user friendly Current Alarm View provides user an always updated view of the current network faults. The color of alarms can be configurable. Alarm summary counters are also displayed.
Alarm Filtering and Sorting	Support filtering and sorting capability in Alarm View. Filters can apply to any fields (Including user defined fields) in the Alarm record and they can be saved into DB.
History Alarm View	Support History Alarm in DB and GUI view to handle alarms that are cleared or closed.
Alarm Acknowledgement	User can acknowledge any alarms. Alarm beeping or flashing can be configured with Alarm Acknowledgement.
Alarm Correlation	Provides the infrastructure to correlate and suppress alarms based on predefined and user configurable correlation rules.
Alarm Notification	Supports the user configurable alarm notification through email, page and trouble tickets based on alarm type and source.
Alarm Configuration	Support configuration of alarm severity, correlation rules, and alarm notifications at per alarm basis.
Close Alarm	Support manual closing of any alarms.
EMS Alarm	Support generating and closing EMS alarms such as EMS loss connection with device, database full, EMS server hardware failure, etc.
Manual Alarm Synchronization	Support manual alarm synchronization between EMS server and network devices.
Alarm Relay	Support Alarm Relay input and output configurations.



## Configuration Management

Elite System Configuration Management application provides the functionalities for addition, deletion, modification and viewing network configuration information. It also provides the functions to automatically discover and synchronize the network configuration and inventory information. Elite System Configuration Management further provides functions for network operator to view and search physical and logical inventory data that has been discovered and saved in the EMS DB.

In addition it allows network operator to automate the complex and time consuming configuration and service provision tasks through scheduled batch operations.

### Features:

Feature	Description
Network Auto-discovery	Support auto-discovery the network through standard (SNMP, TL-1/CLI, RPC, CORBA or NETCONF) or vendor proprietary management protocols.
Inventory	Support and maintain the network device inventory information. <ul style="list-style-type: none"><li>• Provide GUI view to display network inventory.</li><li>• Provide search capability to quickly locate a device</li><li>• Provide inventory exporting to file.</li></ul>
Network Configuration	Support and maintain device configuration such as Chassis, Card, Port, Interface, Power Supply and Fan. Support Configuration View that displays device configuration information and allows user to modify configuration parameters through mouse click.
Chassis View	Display device Chassis View with card, port and LED status.
Network Device Hierarchy Tree View	Support explorer like device tree view for user to navigate device configuration.
Service Provisioning	Support Service Provisioning to network devices
Manual Device Synchronization	Support manual configuration synchronization between EMS server and network devices.
Automatically Synchronization	Automatically network device synchronization is provided to retrieve and sync up all configuration information from network devices automatically based on predefined conditions.
Device Connection Management	EMS periodically ping (or perform a SNMP Get) all devices to maintain the connections with devices.
Link	Support creating and display Links between devices.
Rapid Provision	Support batch based rapid provisioning across network, subnetwork or multiple devices
Configurable Icon and Color	Allow users to configure network, subnetwork and device icon and color in the GUI

## Security Management

Elite System Security Management application allows network administrator to configure both NE and EMS user security according to guidelines so that the network cannot be sabotages and sensitive information cannot be accessed to those without appropriate authorization. It provides the functions to create unique user credentials for every network operations staff members, and to assign and control the user privilege with precision. The powerful and easy to use Customer Network Management (CNM) feature provides functions to manage the network in the shared service provider environment.

Elite System Security Management application also integrates NE or EMS security with Radius or TACCS+ server for authentication.

### Features:

Feature	Description
User Group	Three default user groups are supported. The three groups are Admin, Power User and Operator. New User Group can be created based on new security profiles.
User Creation/Deletion	Provide the function of creating a new user, and modifying/deleting an exiting user.
Security Profile	Support the functions to create/modify security profiles based on access privilege on each operation.
Radius and TACCS+	Integration with Radius and TACCS+ server for authentication
Audit Log	Support per user based audit log that includes the time stamp, user name, operation name and operation status. <ul style="list-style-type: none"><li>• Filtering and sorting on the Audit Log view is provided.</li><li>• Audit Log can be exported into files.</li></ul>
Client Session	Support multiple Client Sessions (up to 50) simultaneously log on to server. <ul style="list-style-type: none"><li>• Support session list that contains the current log on users.</li><li>• Support Abort Session operation to Admin user to kick off any log on users</li></ul>
Client In-Activity Time Out	Support in-activity time out for a client that is idle for 5 (configurable) minutes.
Region Management	Support CNM (Customer Network Management) through Region that is associated with users. <ul style="list-style-type: none"><li>• User can only access the network devices belongs to the associated Region.</li><li>• Region can be created by Admin as the group of one or multiple subnetworks, network devices or cards.</li></ul>
Integration with Third Party Security Module	Elite System provides integration of any security and access control model through a pre-defined interface. This interface is generic and based on Java platform security mode.
SSL	Supports SSL and two way authentication between client and server

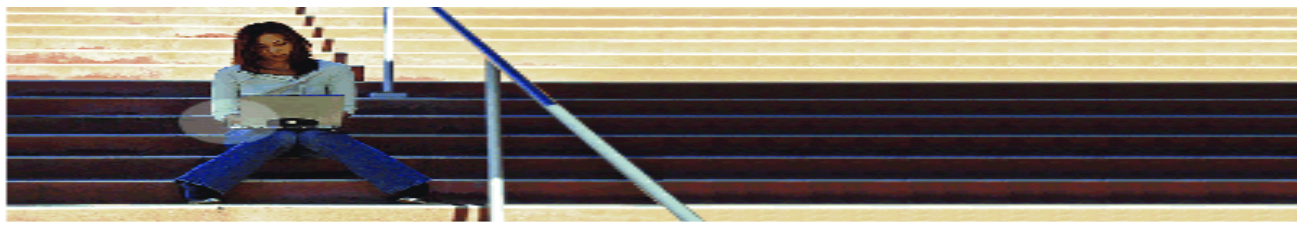
## Performance Management

Elite System Performance Management application provides functions to collect vendor supported physical layer, Ethernet, RMON, SONET/SDH, FEC and other Telcordia GR-0253 based performance statistics.

Elite System Performance Management application further supports any non-standard, vendor proprietary performance statistics. It also allows network operator to configure the polling frequency of network performance statistics, as well as viewing the data in table or graphical charts.

### Features:

Feature	Description
Distributed Polling Agent	Support distributed performance stats polling agents running in different hosts to allow maximized scalability and performance
Data Collection	Support Telcordia GR-0253 based PM collection on Physical, Ethernet, RMON, SONET/SDH and FEC. Support PM data collection with standard or vendor proprietary management protocols.
Proprietary PM	Support non-standard, vendor proprietary performance statistics collection.
Real Time PM	Support polling of real time performance data. The polling interval is configurable.
History PM	Support collecting and logging performance data periodically (configurable) from all network devices.
PM Graph and Table View	Support displaying PM data in graph view (line and bar charts) and table view.
Initialize PM	Support manual initialization of performance data.
Thresholds	Support Threshold Crossing Alert (TCA) as event. Support configuration of threshold values for all performance statistics per NE.



## NE Software and DB Management

Network administrator and operators faces with the huge challenge in dealing with complex, error prone and time consuming tasks to upgrade NE images to hundreds to thousands of NE, or backup and restore NE configuration DB. Image Upgrade, and NE Backup and Restore are typically implemented differently on every NE.

Elite System NE Software and DB management application greatly simplifies the NE image upgrade, Config DB backup/restore with an easy of use workflow and consistent user interfaces that cover all NE types. With Elite System NE Software and DB management application, the time it takes to upgrade NE firmware or DB is greatly reduced from days to hours.

Elite System NE Software and DB management application provides a schedule based and automated process of parallel software upgrade (or DB backup/restore) to multiple NEs in a secure manner. It eliminates the hardware or software incompatibility through pre-upgrade audits. It informs network operators with status and progress in real time basis.

Elite System NE Software and DB management application allows network operator or administrator to backup the entire network configuration to one or several secure locations, locally or remotely. Further, it provides a simple and easy way to restore the network through a list of available backups.

### Features:

Feature	Description
Image Upgrade Workflow	<ul style="list-style-type: none"><li>• Support automated process of parallel device image download to line card or control card through FTP (or TFTP/SFTP) at network level as batch operation.</li><li>• Eliminate repetitive processes by grouping any number of NEs into workflow groups.</li><li>• Support device image upgrade by applying the new images.</li><li>• Provide wizard based flow to guide user through the audit and delivery workflow that includes auditing, downloading, activating, and committing.</li></ul>
Image Upgrade Audit	<ul style="list-style-type: none"><li>• Audit the hardware and software incompatibility before the image upgrade to increase the success rate.</li><li>• Audit the alarm and events while the workflow is taking place</li></ul>
Scheduled Image Download	Organize large image upgrade task with schedule that will be executed in any future time and as often as network operator wants.
Scripts Integration	Integrates with automation scripts to allow any vendor specific audit rules and software releases specifications.
Image Management Monitoring	Allow user to monitor the batch process of image download and activation status and progress
Configuration Backup	Support backup device configuration DB to one or more locations, locally or remotely.
Configuration Restore	Provide easy and simple way to restore NE through a list of available backups.
Scheduled Backup and Restore	Backup/Restore can be scheduled as often as network operator demands, every month, week, day, or on-demand.

## Report Management

The goal of Elite System Report Management application is to provide a quick and easy way to extract data from DB and present it in a useful form. It enables network operator to define the customized reports on performance stats, alarm/events, network status, and inventory information.

### Features:

Feature	Description
Report Setting	Support report configuration so that the customized network stats, service or inventory reports can be generated.
Report Viewing	Support viewing report from GUI as table view or through browser for PDF based report.
Report Notification	Report can be automatically emailed to configurable email address.

## License Management

Elite System License Management application provide functions to control EMS licenses based on network size, expiration time, number of simultaneous clients, and others.

### Features:

Feature	Description
License File Generation	Provide GUI based tool to generate license file <ul style="list-style-type: none"><li>• Use MD5 for message summary</li><li>• Use RSA for digital signature</li></ul>
License Importing	Provide the license importing tool before running the EMS application
License Control	Support controlling of following (configurable): <ul style="list-style-type: none"><li>• Mac Address of server host</li><li>• Number of managed network devices</li><li>• Number of simultaneous clients</li><li>• Expiration date</li><li>• Enable/disable individual feature module</li></ul>
License Upgrade	Allow users to upgrade license file

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