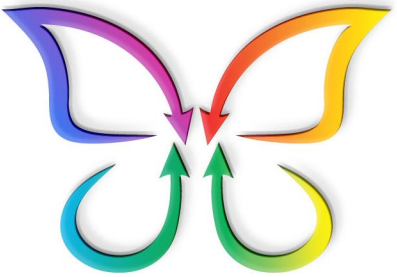
TELENIUM®



Innovative Network Management Solutions

Telenium Network Management

Courtesy of MegaSys Computer Technologies

Printed and produced in Canada.

MegaSys

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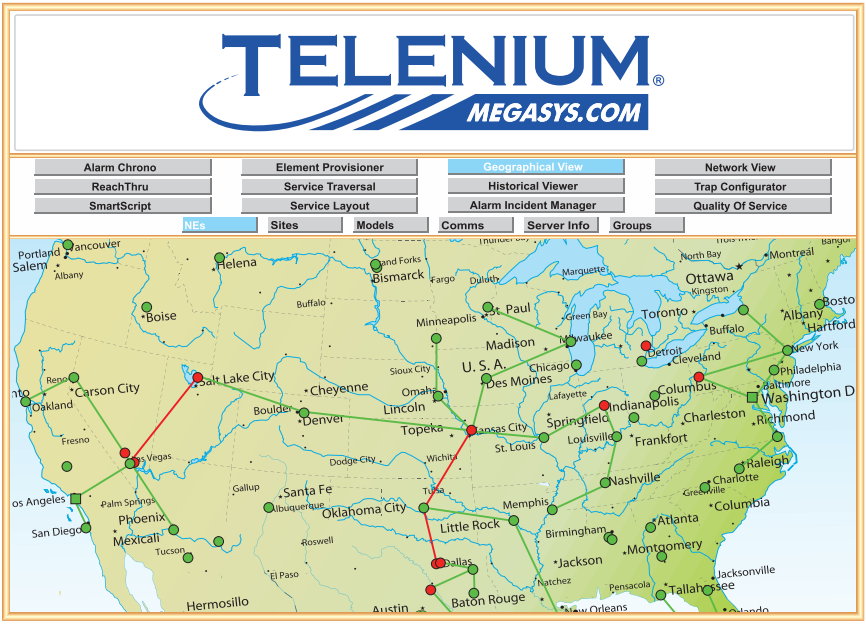
Introduction to Telenium



MegaSys® is the provider of Telenium® Network Management Solutions. Focusing exclusively on telecom network management and provisioning, MegaSys has developed a powerful network management tool that provides complete EML/NML/SML functionality – including full FCAPS capability, auto-population of network architecture, circuit management, high throughput alarm processing and network element backup – integrated in an intelligent, high performance database.

Telenium's versatility, scalability, and ease of configuration is what makes it the network management solution of choice for utility, telecom, cable, government, and other service providers wanting to maximize the return on their network infrastructure investment while achieving compliance with regulatory standards, including FERC/NERC and CIP.

Telenium applications and features that are key to regulatory compliance.

This booklet highlights the Telenium features and applications that contribute to the successful management of a communications network.

It outlines managing all types of network devices with a single user interface for accurate representation of your network configuration, condition, and connections with photo-realistic dynamic graphics. It demonstrates Telenium Service Management applications that provide a real-time accurate view of the circuit path through your network. It also details the fault, configuration, administration, performance monitoring, and security control applications that have factored in the Utilities Telecom Council's selection of Telenium as the *Best Telecom Services Product* multiple times.

TELENIUM NETWORK MANAGEMENT AT A GLANCE

Telenium provides functionality to all aspects of the FCAPS model.

Fault	Configuration	Administration	Performance	Security
Alarm Handling	System Turn-Up	Track Service Usage	Data Collection	Control NE Access
Trouble Detection	Network Provisioning	Store History for Billing	Report Generation	Enable NE Functions
Trouble Correction	Auto-Discovery	Automatic Archiving	Data Analysis	Access Logs
Test and Acceptance	Backup and Restore		Quality of Service	
Network Recovery	Database Handling			

COMMUNICATIONS PROTOCOLS

Today's networks are populated with both new and legacy equipment, necessitating communication between your network equipment and your network management applications via many different protocols. Telenium successfully manages network elements using a wide variety of protocols including TL1, DNP3, SNMPv1, SNMPv2c, SNMPv3, ASCII, PDS, TBOS, MCS11, NETCONF, LARSE, DCP, DCPF, DCPX, FARSCAN, MOSCAD, PING, CLI, SYSLOG, DMS, Badger, NEC N21, 5ESS, IMUX 2000, PRESIDE, P4, DCM, MXVEW, and LLDP, ensuring its effectiveness as a single network management solution for all your network devices.

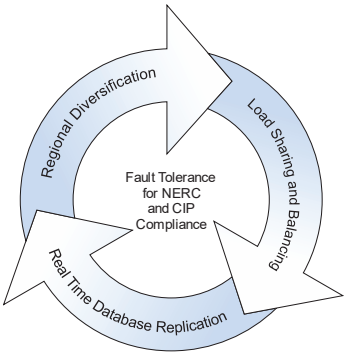
DATABASE PERFORMANCE

The Telenium system provides unsurpassed database performance and can handle thousands of alarms per second, continuously. This critical capability assures Telenium users that all information is available to the operators. There is no need to filter and potentially block key information.

DATABASE SYNCHRONIZATION

Telenium supports the ability to synchronize the same database on different appliances. For synchronized databases, a change to the database on one Telenium appliance is instantly synchronized on all other Telenium appliances, providing the following advantages:

- Instant replication of database information.
- No loss of visibility or control of your network in the event of an appliance failure.
- Optimized network resources by the distribution of database loads across multiple synchronized systems.
- Compliance with the survivability and redundancy requirements of NERC, FERC, and CIP.



Databases can be installed on multiple Telenium appliances on a local area or wide area network.

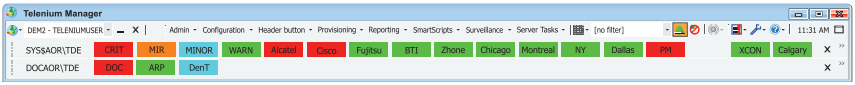
DATABASE SCALABILITY

A key requirement for any network management system is scalability of the database. The Telenium system allows for massive scalability through its object-oriented database and its support of a distributed system architecture. Automatic consolidation of information between the Telenium EML systems and the Telenium NML and SML systems provides operators with a single pane-of-glass management capability.

Chapter 2:
Graphical User Interfaces

Telenium provides several different dynamic graphical user interfaces to easily navigate, diagnose, and solve network issues.

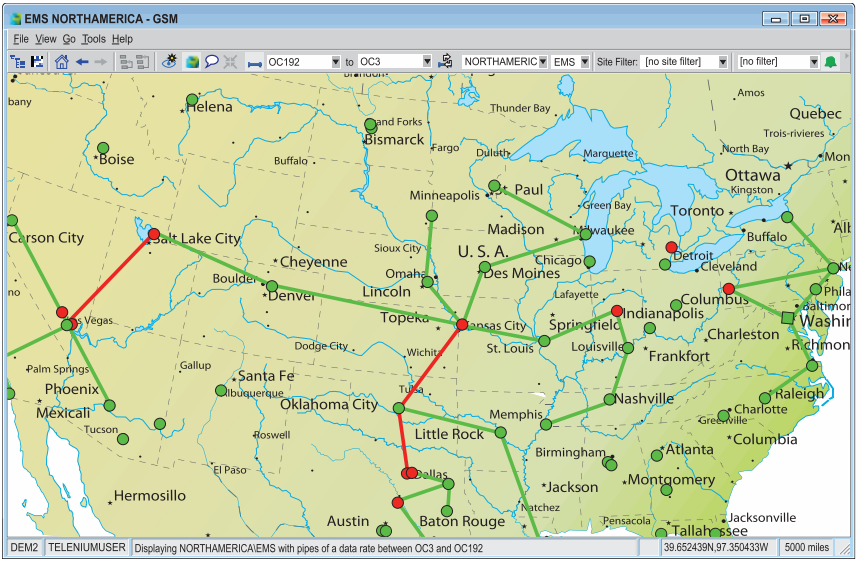
TELENIUM MANAGER AND TELENIUM CLIENT SUITE



Telenium Manager is the all-in-one network management interface. Opening Telenium Manager permits users to log on to Telenium databases and start Client Suite applications. The Telenium Client Suite is a group of applications used to monitor, provision, and maintain networks. The Telenium Manager Client Suite is installed locally on your PC.

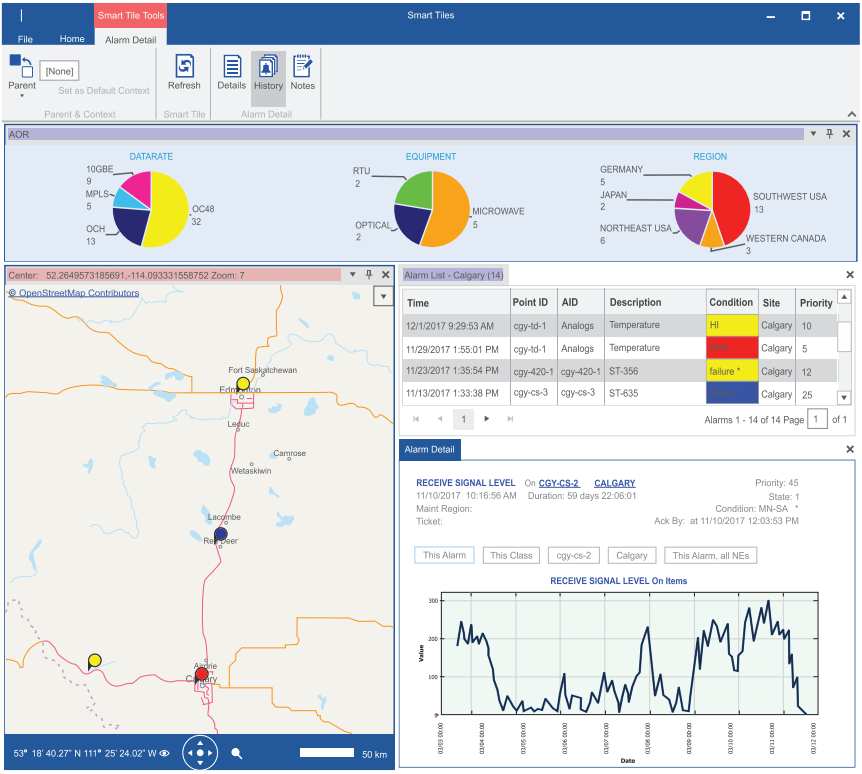
GRAPHIC SCREEN MANAGER (GSM)

GSM is a graphical user interface that dynamically displays database information. A geographical GSM presents alarms and their network locations, while the graphical manager depicts real-life representations of physical equipment.



TELENIUM SMART TILES

Telenium's Smart Tiles application is a dynamic solution featuring contextual navigation. It provides a customizable dashboard which simplifies tasks by reducing the number of application windows open at one time. Smart Tiles displays alarms, PM data, physical topology, facilities and circuits, and a host of additional views and Telenium applications that react dynamically to the operator's selections, providing a cohesive representation of network and device statuses.

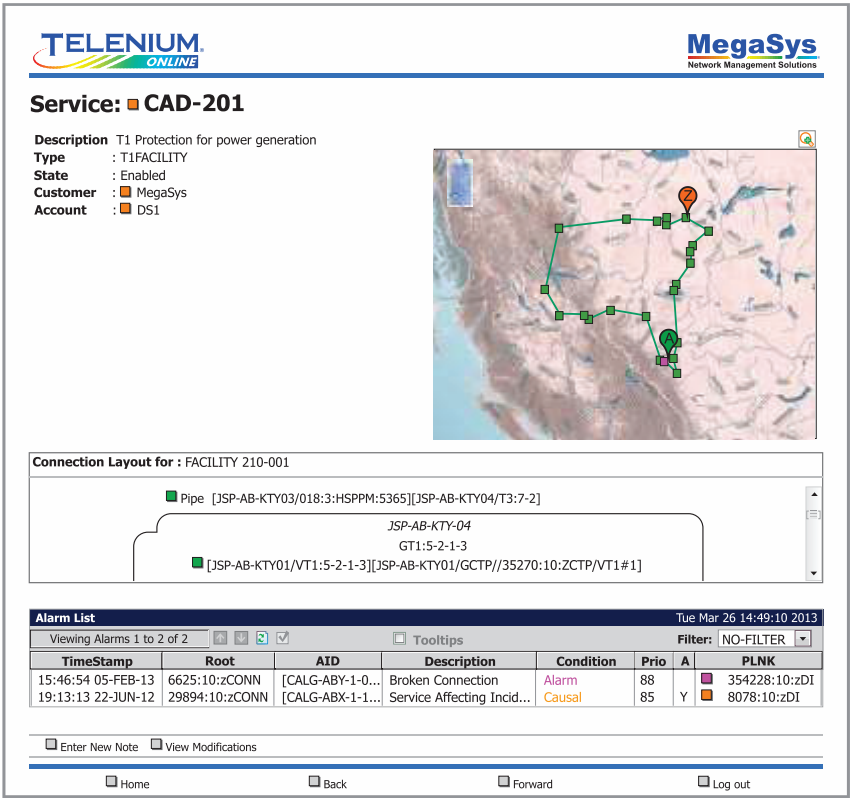


TELENIUM ONLINE

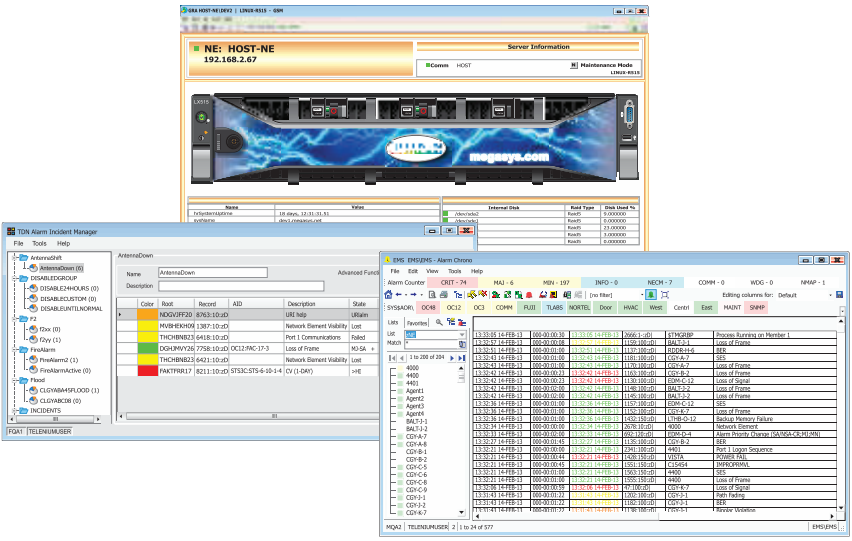
Telenium Online is an application that enables viewing the Telenium system remotely via the Web. You can view and acknowledge alarms from a system-wide alarm list, view sites, NEs, and customers, as well as retrieve network element backup files.

Logon groups can be used to partition users in Telenium Online. Users who are part of a logon group only see the information that is allowed according to the privileges and priorities defined within the group.

The service screen features a map view and connection layout of the service.



Chapter 3:
Fault Management



Telenium provides operators with fault management tools, allowing them to detect network failures and quickly navigate through affected equipment to isolate and correct any problems efficiently and effectively. This functionality is achieved through a fast, high resolution graphic interface connected to a high-performance database.

The unique object-oriented design of the database ensures the impact of an alarm within the network context is quickly and easily realized. This allows operators to identify equipment, facilities, and customers affected by these failures.

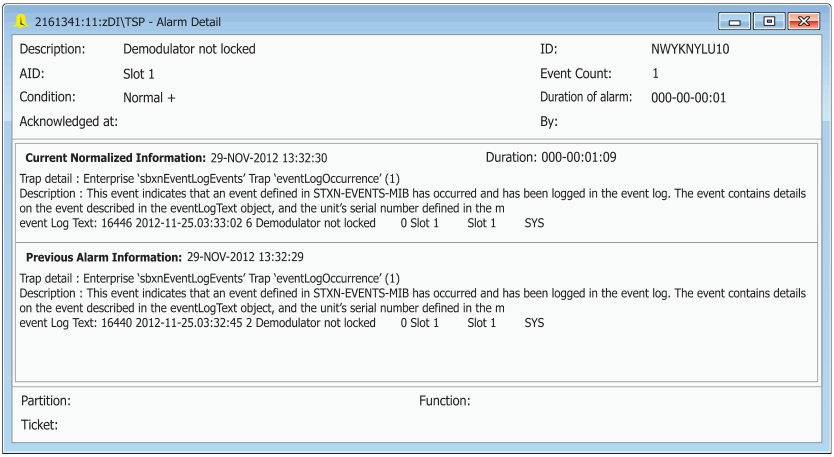
The Telenium system also self-monitors and raises alarms when disk or other system faults occur, such as when:

- Disk or memory capacities reach operationally low conditions.
- Applications consume excess CPU time.
- Applications shut down unexpectedly.

All Telenium system applications are monitored and automatically restarted if a failure occurs.

ALARM PROCESSING

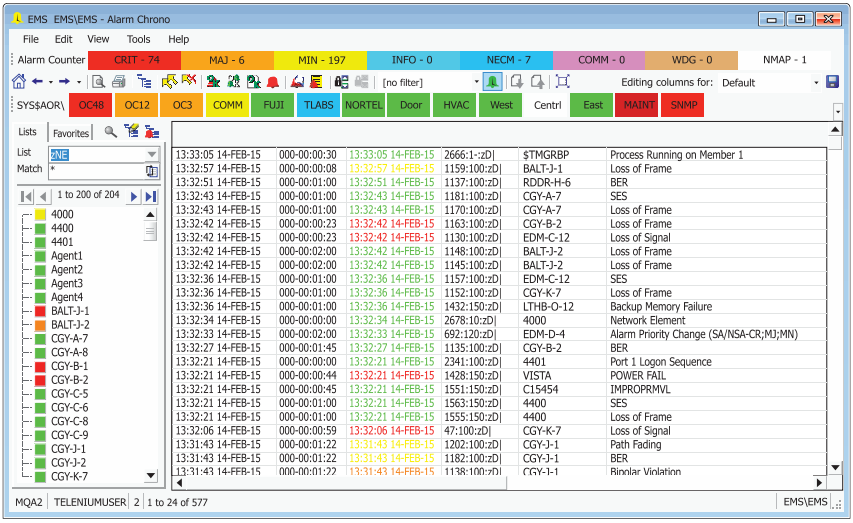
Alarms are displayed graphically within seconds of being received from the network element. Network fault management alarm data consists of conditions reported by the field equipment. All alarm event details, including the original message received from the element, can be archived for analysis. An adjustable periodic display of alarm events in your network is available from the Alarm Journal tile in the Smart Tiles application.



ALARM CHRONO

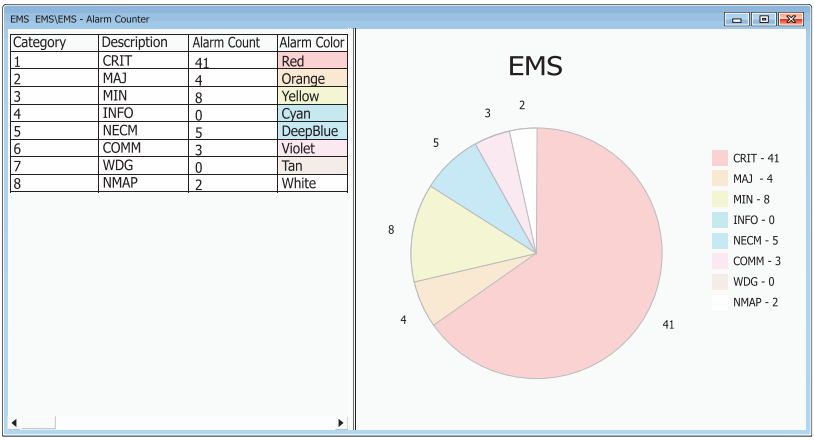
Alarm surveillance is crucial for detecting network problems. Telenium's fault management applications continuously process thousands of alarms per second and automatically sort alarms into user configurable groups. System Administrators can color code alarms, so their priority reflects the severity of the originating alarm.

Alarm Chrono displays current alarm lists and alarm information for all equipment in the network, and can be used to acknowledge, enable, disable, and sort alarms for enhanced system monitoring. Alarm comments can also be added to alarms to help field technicians communicate with operators.



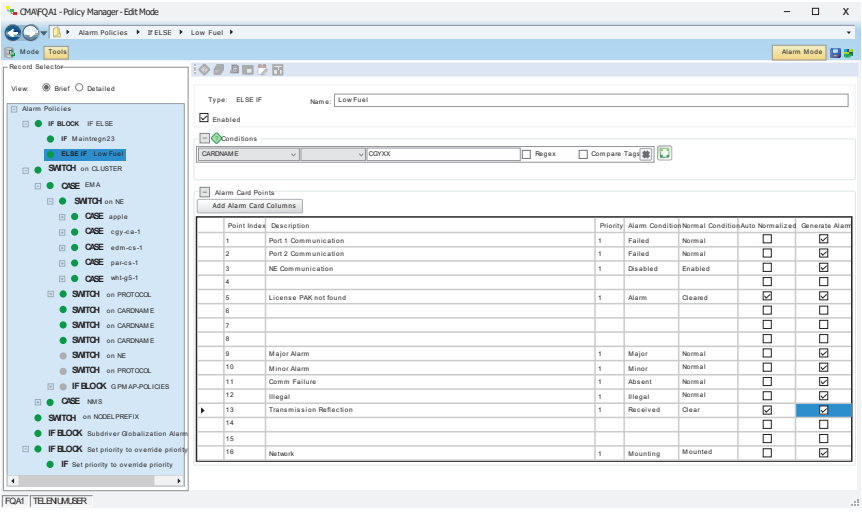
ALARM COUNTER

Alarm information can be exported into easy-to-use presentation views, charts, and 3D rotations through our Alarm Counter application. This tool provides a categorized count and graphical interpretation of active alarms, to quickly assess the health of the network.



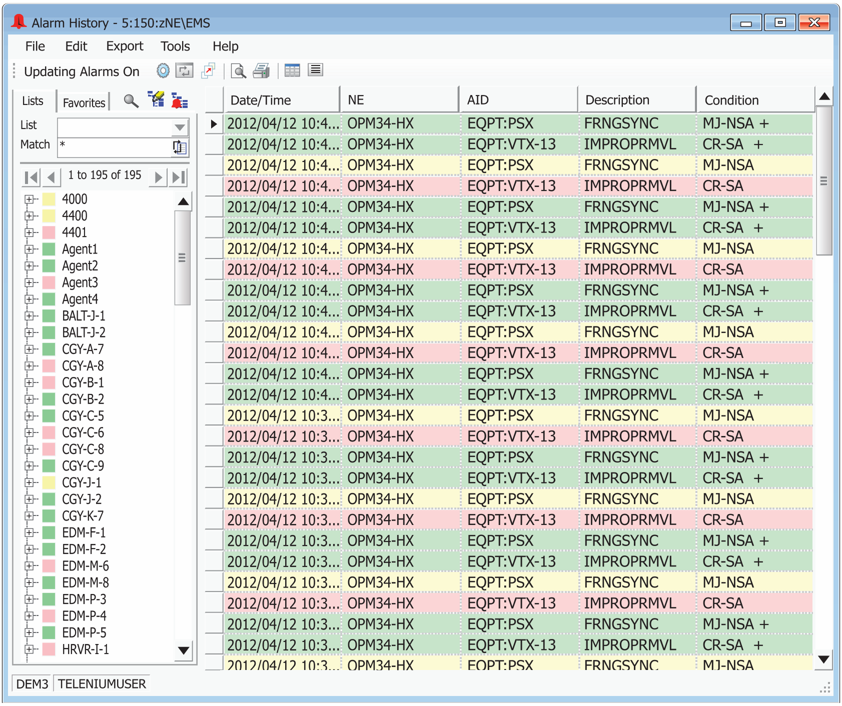
POLICY MANAGER

Policy Manager gives you extensive control over every alarm, event and analog handled by the Telenium system. Policies can be created to affect a myriad of characteristics including setting alarms to one of 99 different priorities, enforcing analog threshold limit checking and modifying alarm descriptions to improve readability



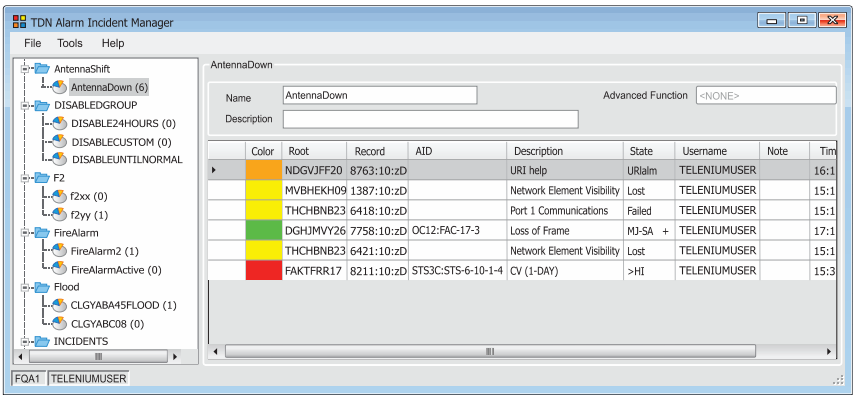
Alarm History

The Alarm History application shows the local alarm history stored in the database. The number of history entries stored in the logs at the network element and global level is determined by a customizable parameter.



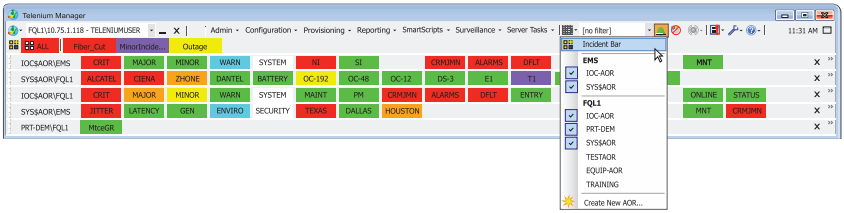
ALARM INCIDENT MANAGER

Telenium allows associated alarms to be organized into incidents for better tracking and control of alarm events. Once created, these incidents are available in other applicable Telenium applications.



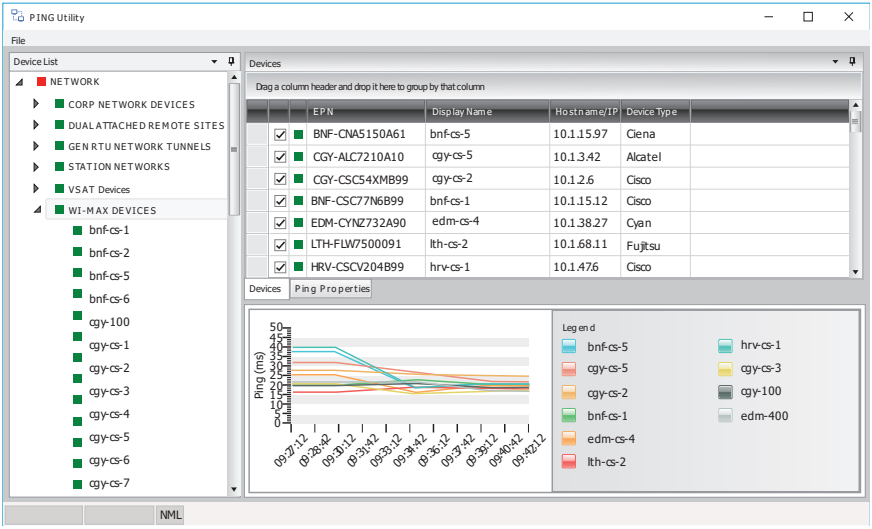
AREA OF RESPONSIBILITY (AOR)

Telenium AORs allow correlation of alarms based on user-defined parameters such as geographic location, network element type, alarm severity, alarm impact, and many other combinations of criteria.

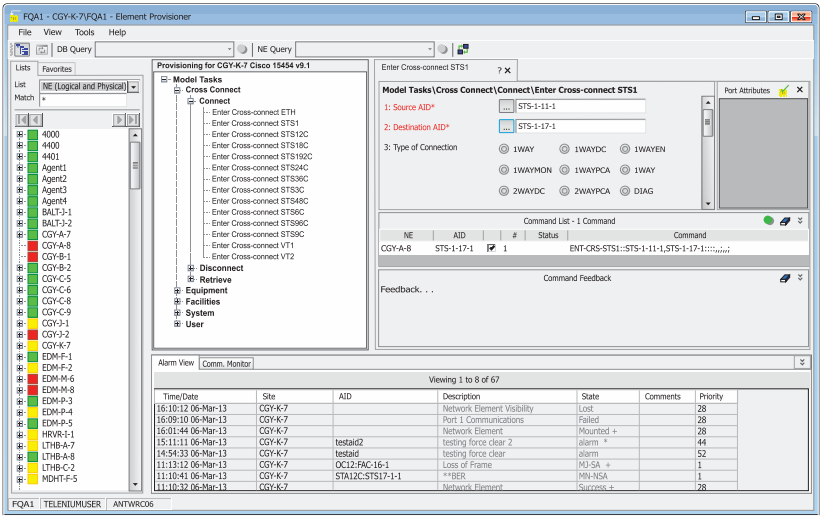


PING UTILITY

The PING Utility application displays the ping status of the selected network devices and indicates a loss of signal alarm if the ping timeout threshold has been crossed. Numerous networks can be displayed concurrently for a specified time range.



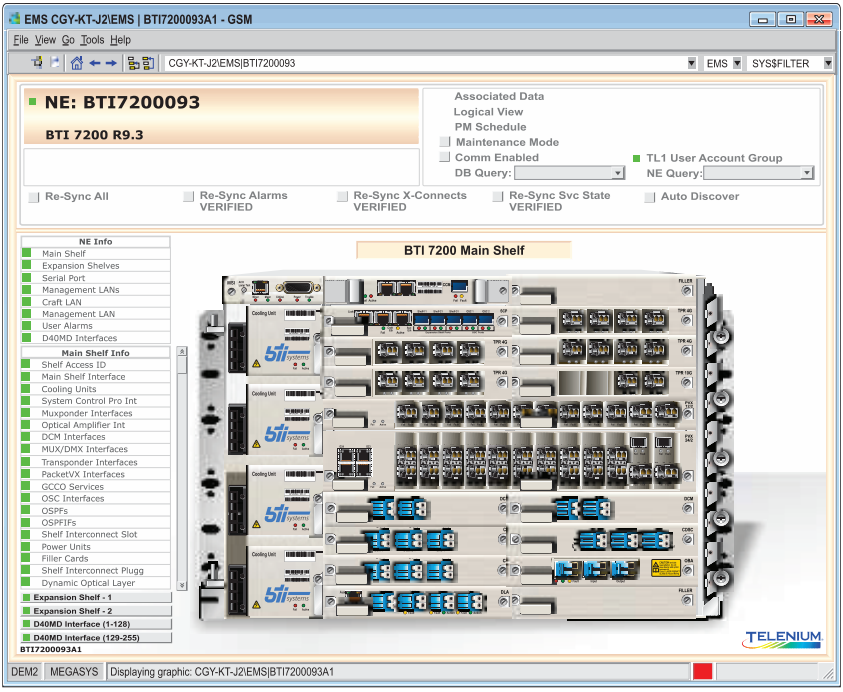
Chapter 4:
Configuration Management



Network elements are accessed and managed over your network using Telenium's configuration tools.

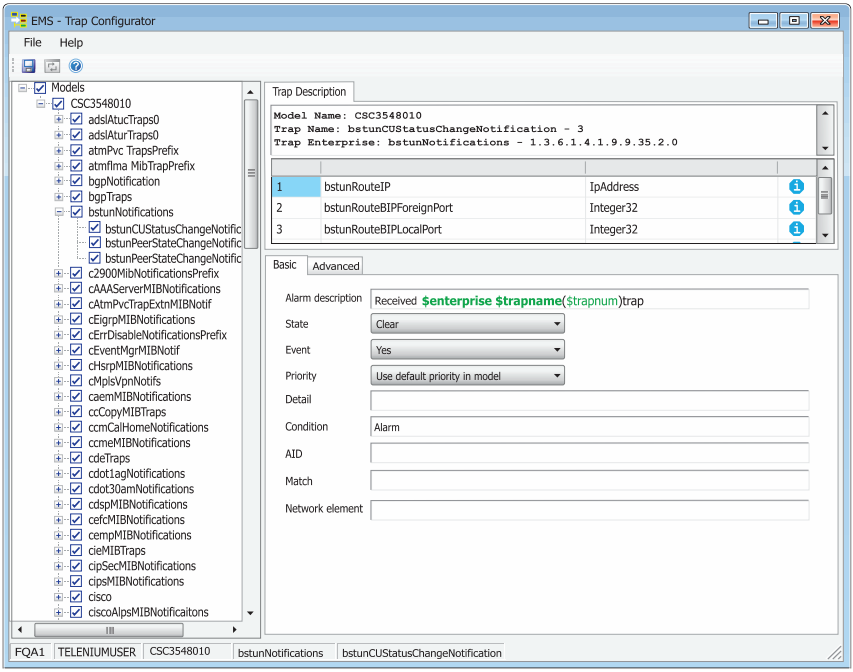
TELENIUM MODELS

Telenium's unique concept of modeling network elements makes turning up and maintaining your network management system fast and simple. Models describe the entire range of card configuration, alarms, and provisioning commands available on a network element. This template can be applied multiple times to represent each unique element in your network. When combined with the AutoDiscover feature, you can have full network surveillance on your network within hours, not days. AutoDiscover queries the database to populate records to exactly match the physical configuration of a piece of network equipment.



SNMP MANAGEMENT

This application allows system administrators to compile SNMP MIBs, create a model, and customize how Telenium processes traps received from the equipment associated with the MIBs. A model generated in this way will not support any of the higher functions offered by a full model developed by MegaSys, but still allows you to monitor the device.

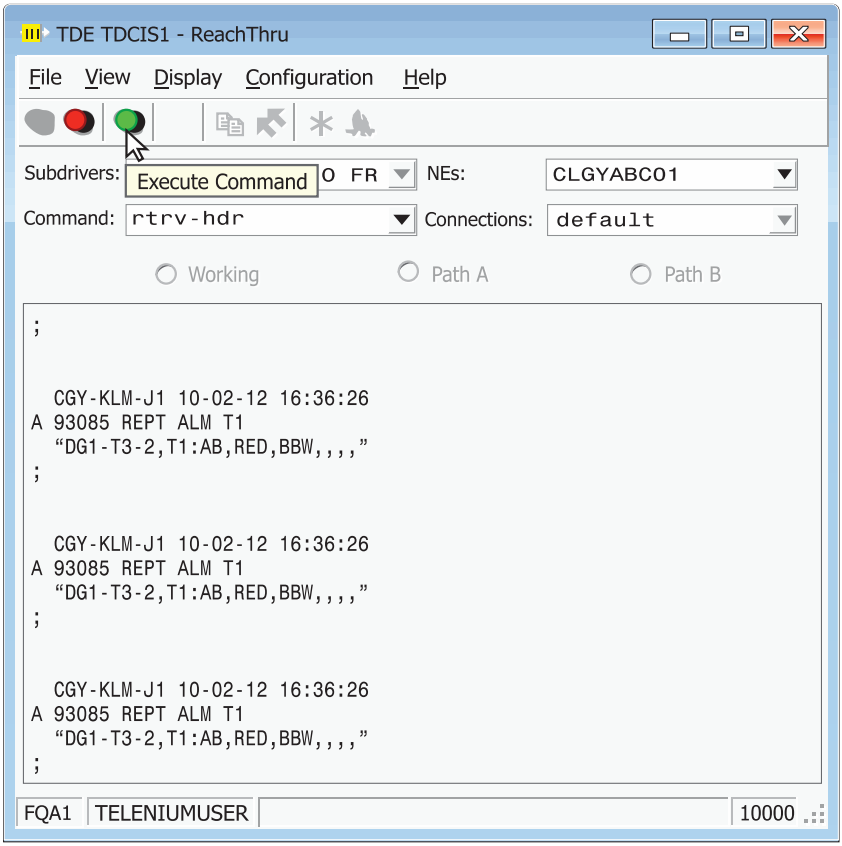


REACHTHRU

This diagnostic tool for communication issues reviews messages passed between a network element and the database, pinpointing the source of communication breakdowns so they can be fixed.

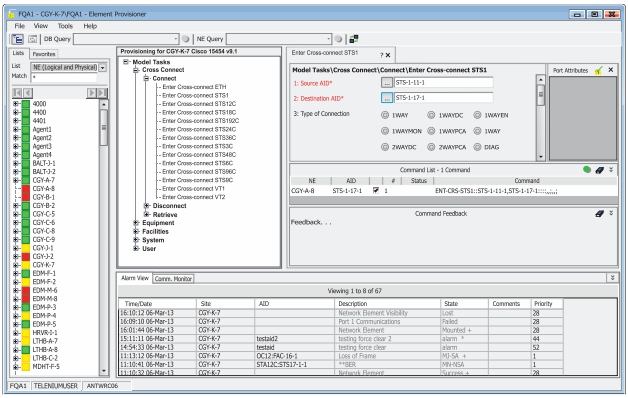
Messages consist of:

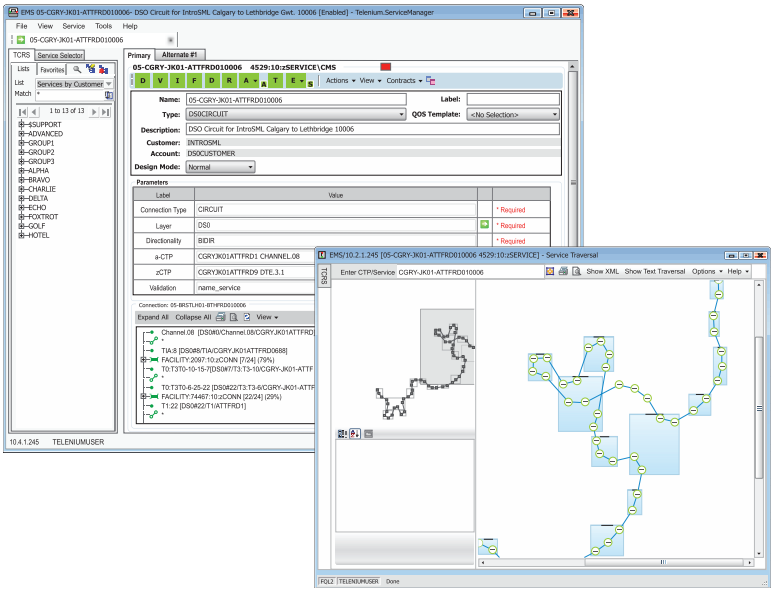
- Commands sent by the subdriver.
- Physical equipment responses to these commands.
- Autonomous messages sent by the equipment.



PROVISIONING

Telenium users can provision managed devices through an intuitive interface that supports the customizable sequencing of commands. The integrated security features of the Telenium database implement user level restrictions on provisioning commands, and all commands are logged in audit history.

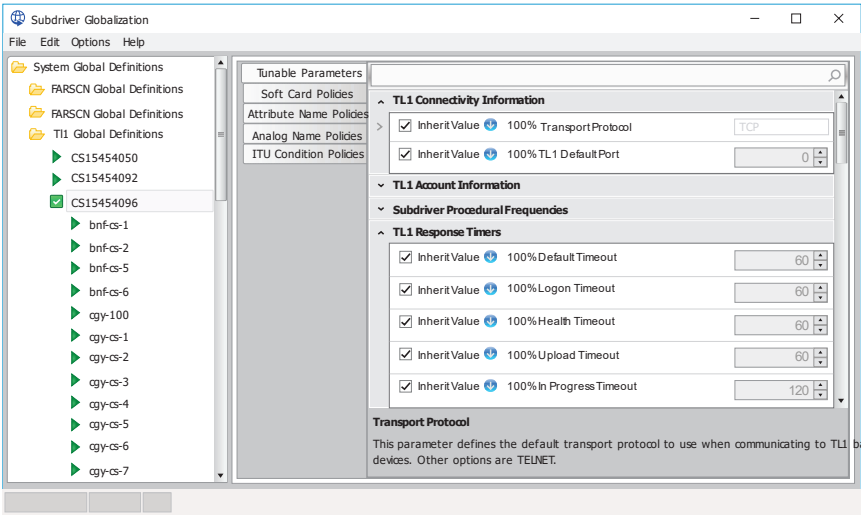




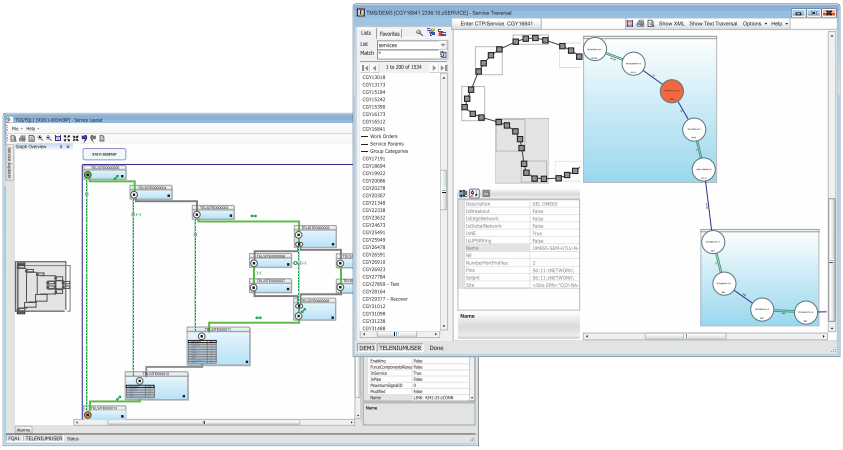
SUBDRIVER GLOBALIZATION

Subdriver Globalization helps to avoid frequent individual updating of model and communication parameters and helps manage tunable parameters and policies from a global view. Changes can be made to model and network element parameters and policies and then the settings can be saved in Subdriver Globalization.

Subdriver Globalization gives you the option to set parameters such as accounts, passwords, community strings and other security related information at a global, protocol, model, and network element level across the database.



Chapter 5:
Administration Management



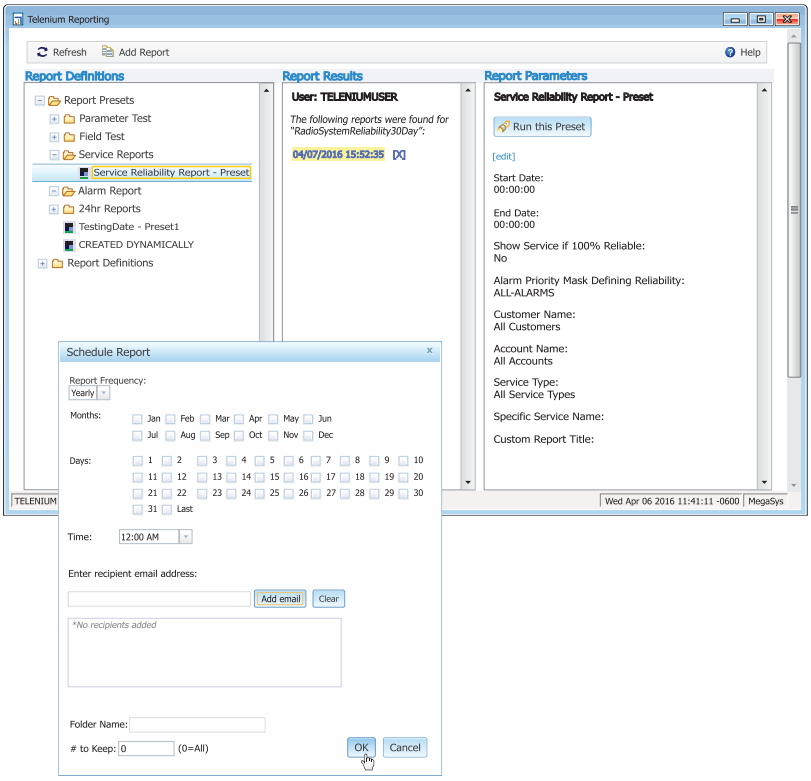
Telenium's administration features allow you to generate reports reflecting information contained in the Telenium database. In addition to Telenium's easy-to-access pre-defined reports, you can create customized, historical, and automated reports.

You always have an up-to-date listing of what is in your network because Telenium builds its database by querying the equipment directly. Inventory reports identify circuit packs and their associated service states and attributes, and are easily generated with Telenium's reporting tools. Telenium also provides a quick view of your current bandwidth allocation.

TELENIUM REPORTING

Regulatory Compliance

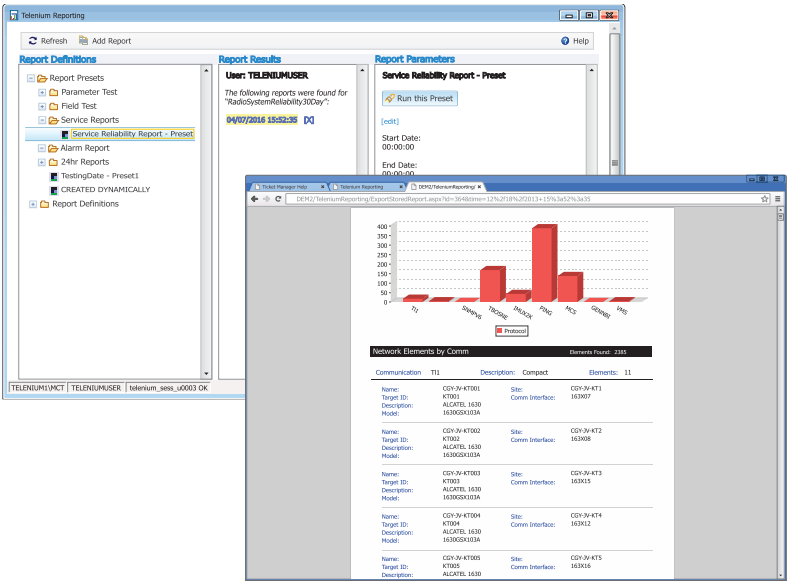
Telenium's reporting application is used to collect historical and online data, and automatically publish this data to reports that can be emailed to selected individuals or stored in a directory. Telenium Reporting includes the ability to create custom reports and also contains a selection of pre-defined reports.



TELENIUM REPORTING – PRE-DEFINED REPORTS

Pre-defined reports provide quick access to network data. Telenium Reporting includes a selection of ready-to-use reports, such as:

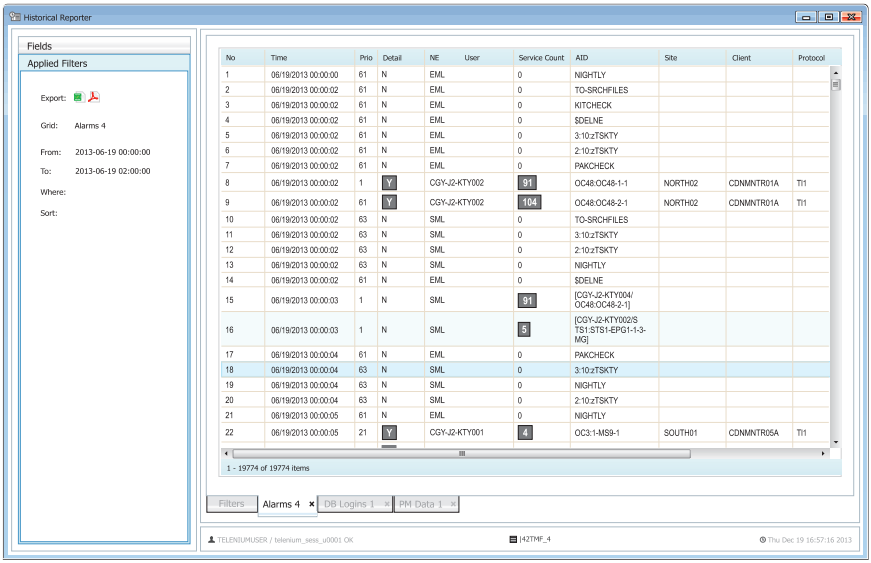
- General Network Element Information
- Network Element Inventory
- Network Element Performance
- General User
- QOS Manager Entries
- Service Reliability
- Network Element Reliability
- Site Visibility
- Alarm Frequency



HISTORICAL REPORTER

Regulatory Compliance

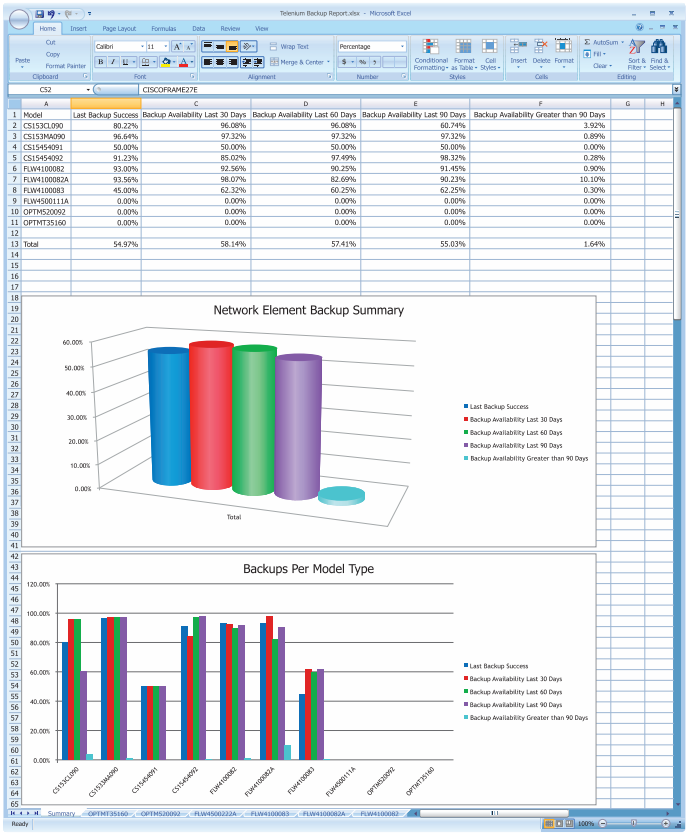
Review previous alarms, audits, logins, and performance management data to identify bottlenecks and potential opportunities.



NETWORK ELEMENT BACKUP AND RESTORE

Regulatory Compliance

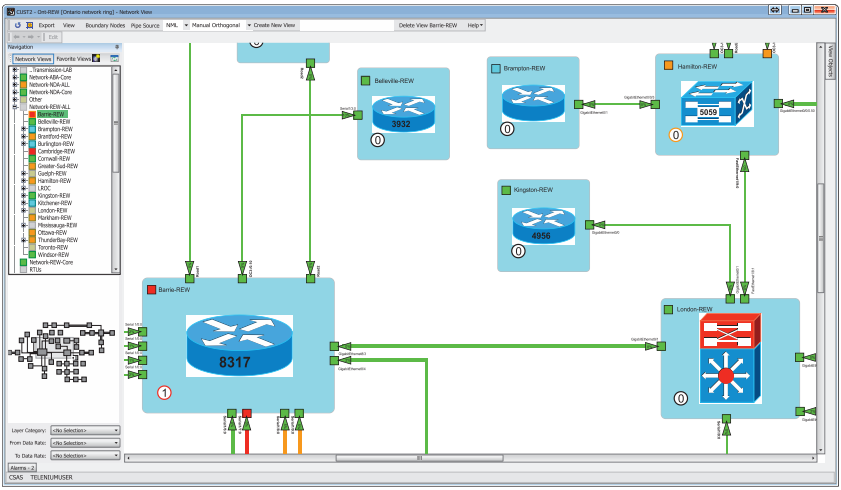
Telenium automatically backs up network element databases to the Telenium server. Backups can be scheduled as often as required, and the Telenium system automatically stores the last ten backups on its server. Telenium can also perform a restoration of a previously saved backup to the network element, providing rapid reinstatement of service to customers. If the network element is completely isolated, a field technician can simply download the backup image and restore it directly to the network element.



Model	Last Backup Success	Backup Availability Last 30 Days	Backup Availability Last 60 Days	Backup Availability Last 90 Days	Backup Availability Greater than 90 Days
CS153CL090	80.22%	96.08%	96.08%	60.74%	3.92%
CS153MA090	96.64%	97.32%	97.32%	97.32%	0.89%
CS1545A091	50.00%	50.00%	50.00%	50.00%	0.00%
CS1545A092	91.23%	85.02%	97.49%	98.32%	0.28%
FLW4100082	93.00%	92.56%	90.25%	91.45%	0.90%
FLW4100082A	93.56%	98.07%	82.69%	90.23%	10.10%
FLW4100083	45.00%	62.32%	60.25%	62.25%	0.30%
FLW4500111A	0.00%	0.00%	0.00%	0.00%	0.00%
OPTMS20092	0.00%	0.00%	0.00%	0.00%	0.00%
OPTMT35160	0.00%	0.00%	0.00%	0.00%	0.00%
Total	54.97%	58.14%	57.41%	55.03%	1.64%

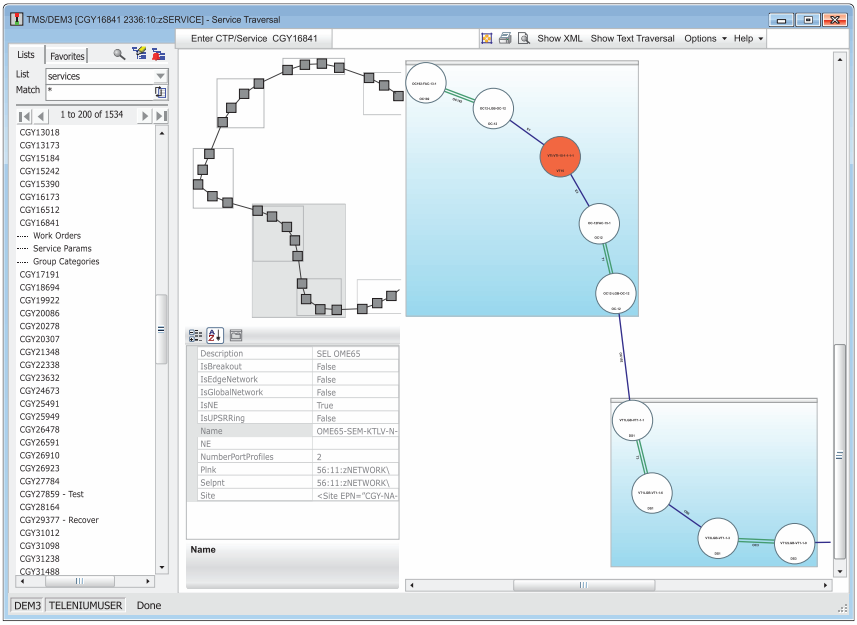
NETWORK VIEW

This application is used to view the topology of a telecom network. Network View displays pipes, port names, port loads, and alarm counts, as well as other information. The network can be presented in a variety of different formats.



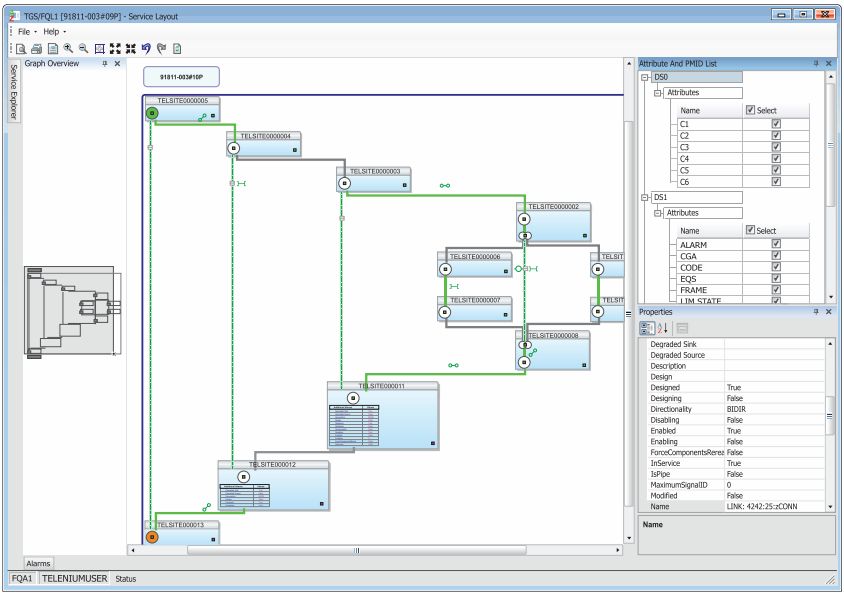
SERVICE TRAVERSAL

This application presents the complete traversal of a service. You can identify missing pipes or cross connects and broken endpoints are displayed. You can also select a point in the depicted service to launch supporting Telenium applications to facilitate troubleshooting. The circuit topology presented is based on knowledge gathered by Telenium from the network elements.



SERVICE LAYOUT

Capable of displaying the entire layout of a service connection, Service Layout presents only the high level view as a starting point. You can view details of the service, such as service attributes, performance monitoring information, and alarm information, by expanding the components or member connections.



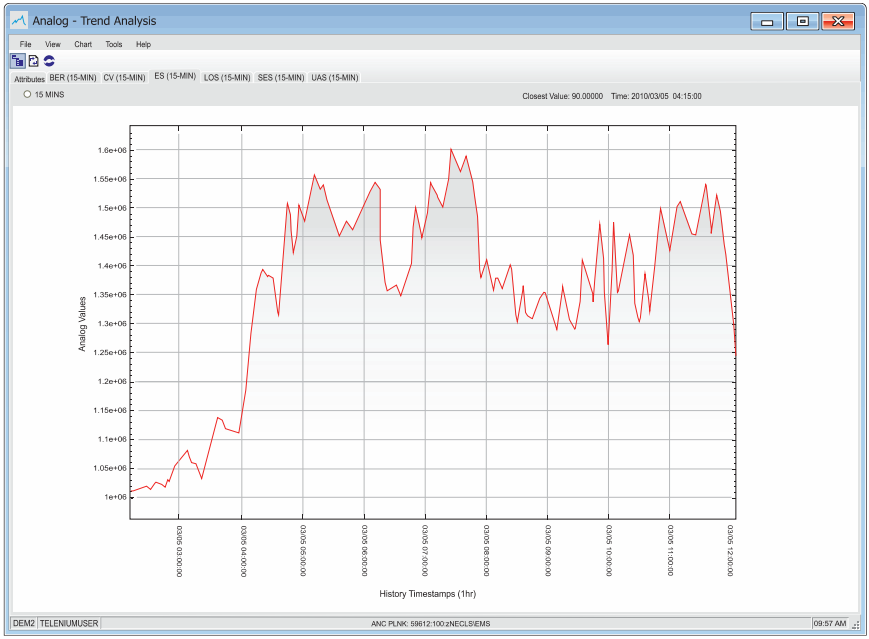
Chapter 6:
Performance Management

Performance management includes network utilization reports for capacity planning and switch reports for cost analysis, service quality metrics, reports for isolation of fault locations in degraded incidents, and archival of performance data for various management reports and trending.

REAL-TIME GRAPHICAL TRENDS

The most recent 120 values of network performance monitoring data are maintained in the database for immediate trend analysis. Network performance monitoring data can be archived to allow long-term analysis trending.

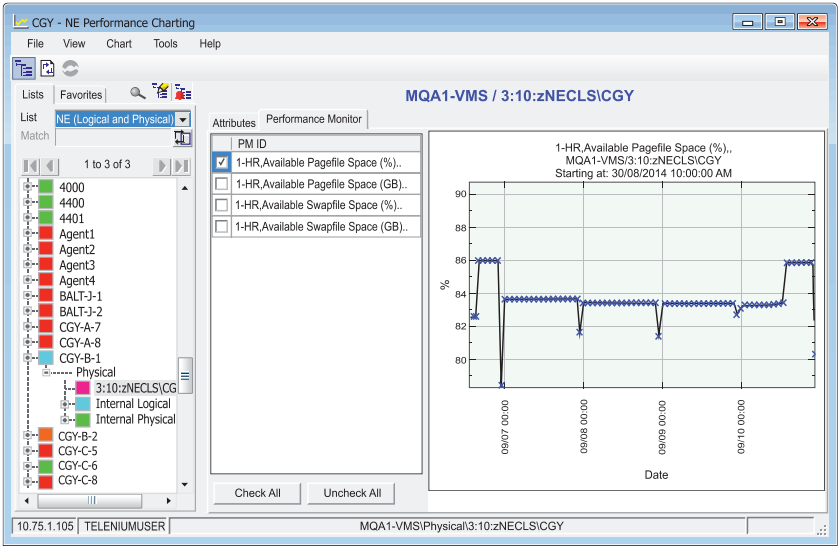
You can design performance trends with the Telenium Graphics Editor (GED) for monitoring bit error rates, and other user-definable network performance thresholds.



NETWORK ELEMENT PERFORMANCE CHARTING

Network Element (NE) Performance Charting displays any type of performance or analog data collected by the Telenium database.

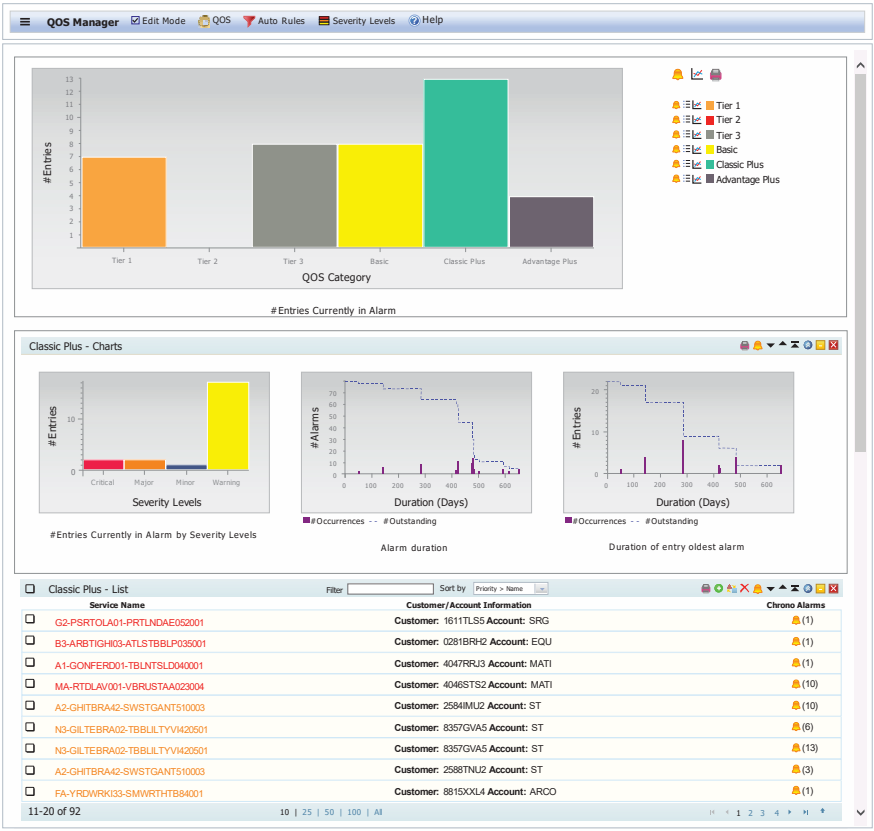
Users have the option of viewing data as text values or one of three graph types: area, line, or step.



QUALITY OF SERVICE MANAGER

Regulatory Compliance

Use the Quality of Service Manager application to monitor all types of performance and analog data, and to automatically initiate alarms based on customizable service level agreement parameters.



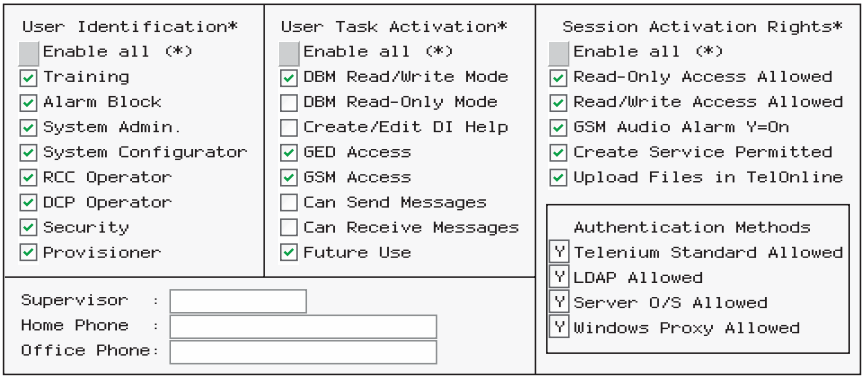
Chapter 7:
Security Management

Telenium utilizes a variety of features for network security controls to protect your network from tampering.

Multiple Levels of Access

Regulatory Compliance

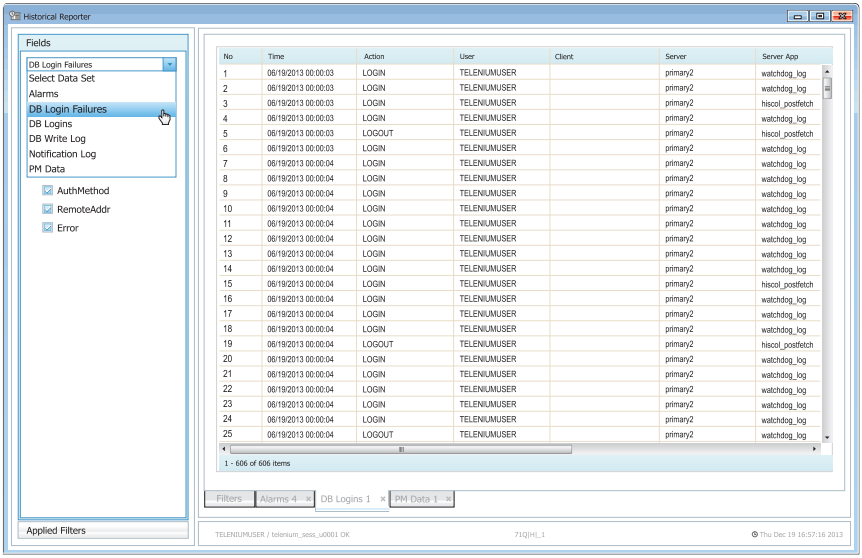
Set appropriate access privileges for a wide array of users. Users can be configured for no access, read-only access, or read/write access to the database. Users with read/write access can be further limited to write privileges on specific fields only.



USER ACTIVITY TRACKING

Regulatory Compliance

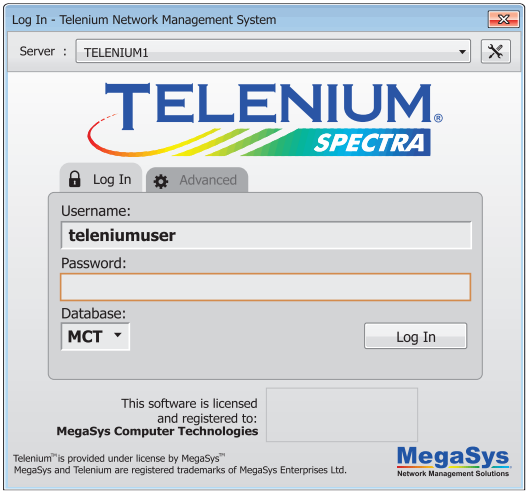
All of a user's activity, such as logins, login failures, alarm acknowledgements, provisioning commands, system configuration changes, and rejected attempts to perform any actions outside the user's rights and privileges is tracked in the Telenium database and is held in the historical files of the database for reference and reporting.



SECURE AUTHENTICATION

Regulatory Compliance

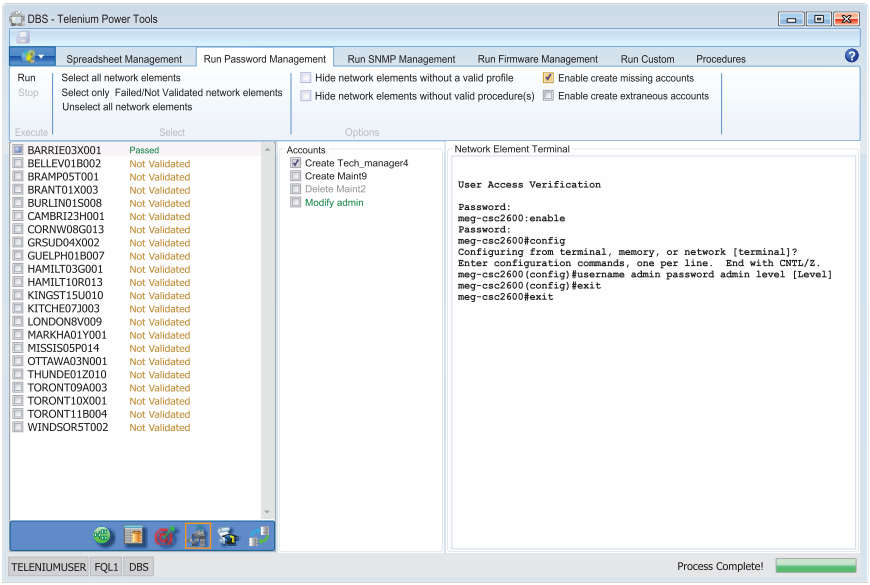
Telenium supports both the Lightweight Directory Access Protocol (LDAP) and the Remote Authentication Dial-In User Service (RADIUS) for authentication to the Telenium database. Additionally, a user account must be defined within the Telenium database to describe the rights and privileges any users have once they authenticate with the external LDAP and RADIUS servers.



NE PASSWORD MANAGER

Regulatory Compliance

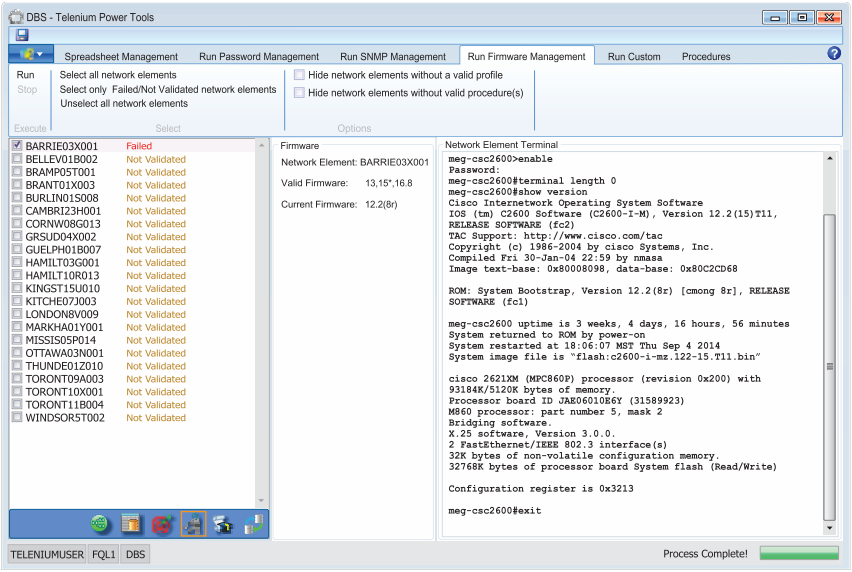
From the Telenium network management suite, appropriately privileged users can add, delete and revise all accounts and passwords on network elements. NE Password Manager provides an intuitive interface for the creation of user-defined macros of the procedures required to change user names and passwords on even the most complex devices.



FIRMWARE COMPLIANCE REPORTING

Regulatory Compliance

NERC and CIP v5 require reporting of current firmware versions of network elements. Firmware Compliance Reporting provides the firmware status of devices, and also issues a non-compliance report based on a comparison of actual firmware versions to the acceptable firmware versions entered into the Telenium application.

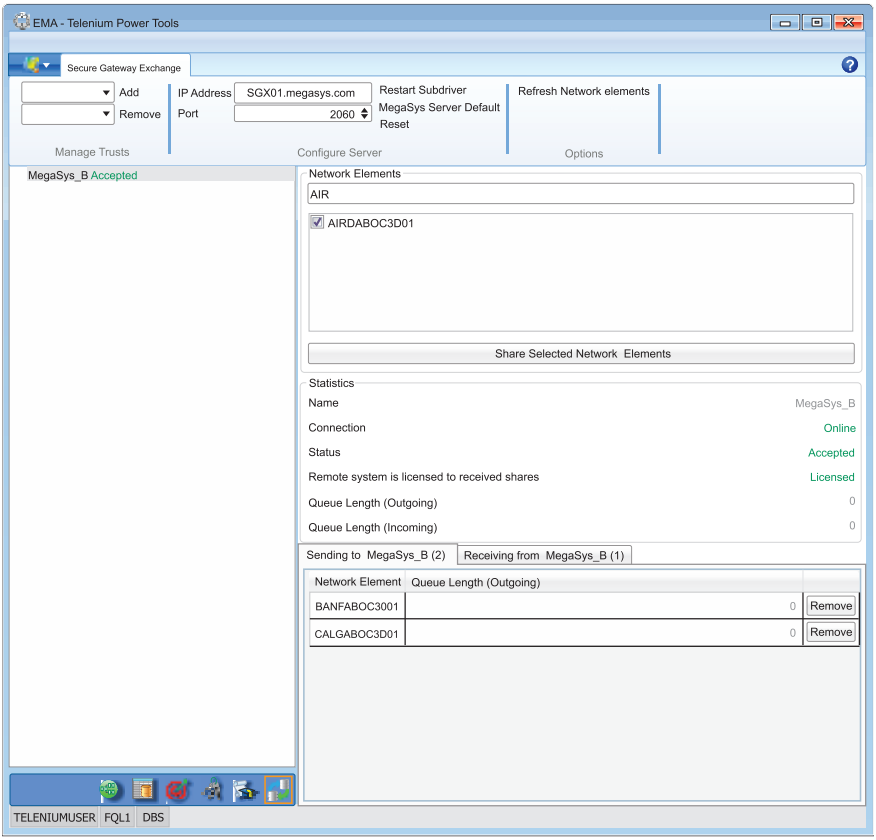


SECURE VISIBILITY OF SHARED INFRASTRUCTURE

Regulatory Compliance

SECURE GATEWAY EXCHANGE (SGX)

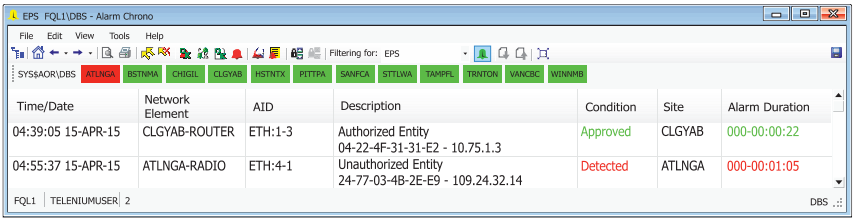
SGX has been developed to provide secure visibility to shared network infrastructure. The owner of shared or leased facilities can grant trusted access to independent users of network components, allowing cooperating providers to better manage their networks with real-time network usage and performance information while maintaining the security and confidentiality of all participants without impacting the integrity of any of the individual intranets.



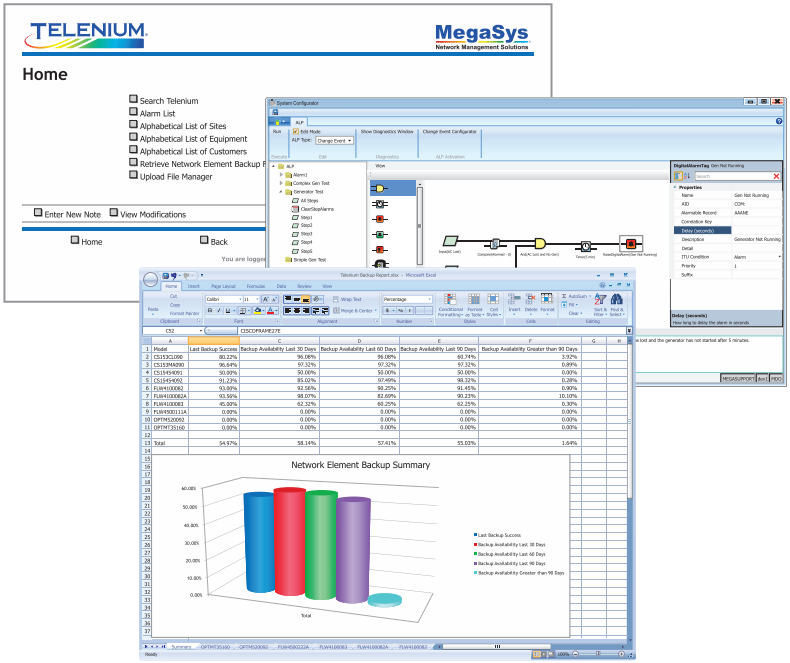
EXTERNAL PERIMETER SECURITY

Regulatory Compliance

Telenium External Perimeter Security records all MAC and IP addresses detected by IP-based network equipment. Referencing user-defined authorizations, EPS raises configurable events and alarms upon detection of new or recurring connecting entities. Information presented to the operators and to the historical files includes the IP address, MAC address, DNS reverse lookup, and even the manufacturer of the LAN card. Users can implement specialized actions on detection of these unauthorized accesses to include generating audible alarms, launching Advanced Logic Processing to initiate blocking of access, emailing details of the event to specific users or user groups, and generating SYSLOG messages to a security management system.



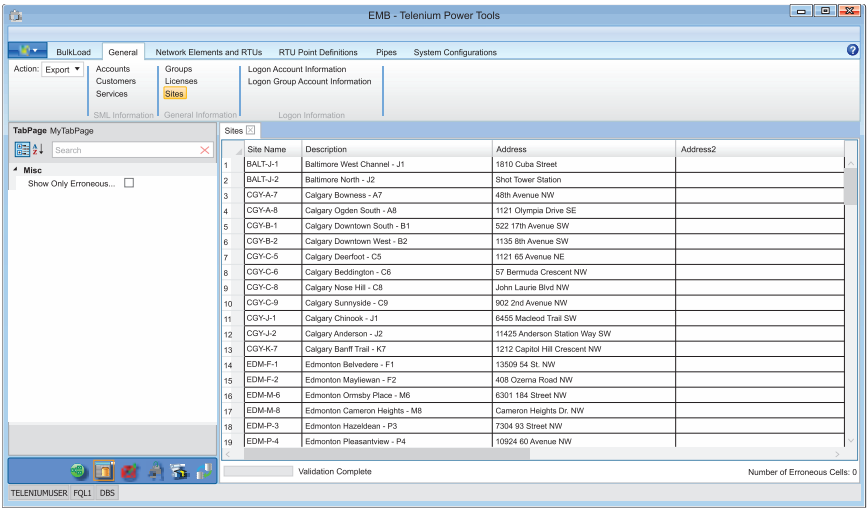
Chapter 8:
Advanced Telenium Functions



Telenium's advanced functions provide users with additional database management, alarm escalation, network restoration, and network element provisioning capabilities so they can efficiently configure and manage a wide array of network information from a few key applications.

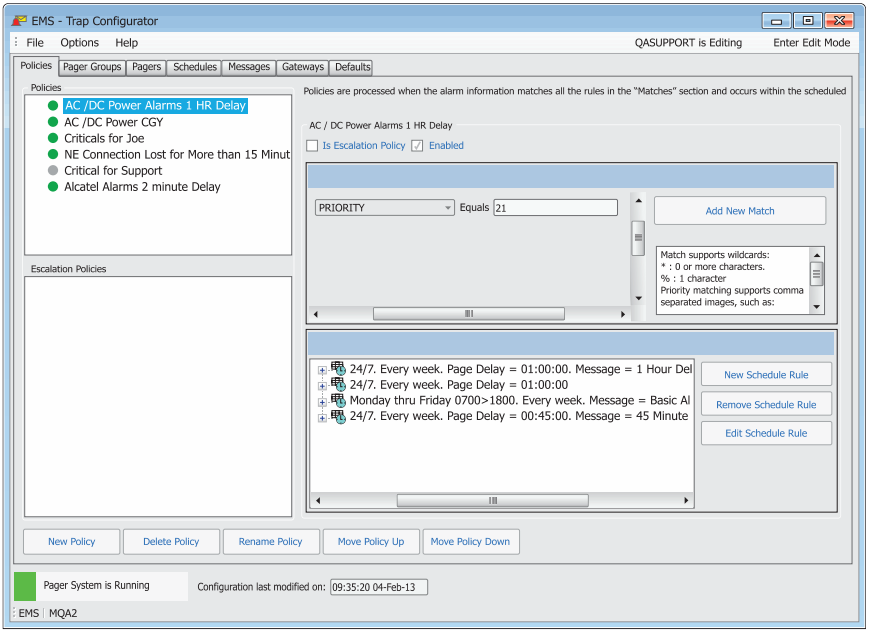
BULK IMPORT/EXPORT

Import and export network information in a database using Microsoft Excel spreadsheets. This configuration management feature also allows you to make backups of a database, see what information is contained within your database(s), and input new data into the database from one simple tool.



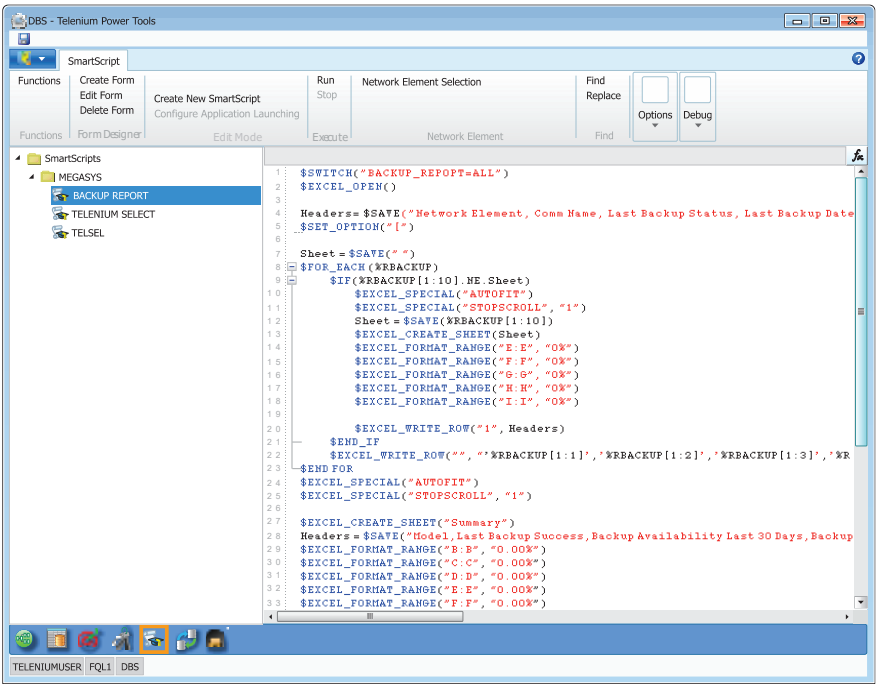
EMAIL AND ESCALATION MANAGER

Telenium will send email notifications to selected recipients. Emails and escalations are triggered by the occurrence of a configured policy based on specific alarm conditions.

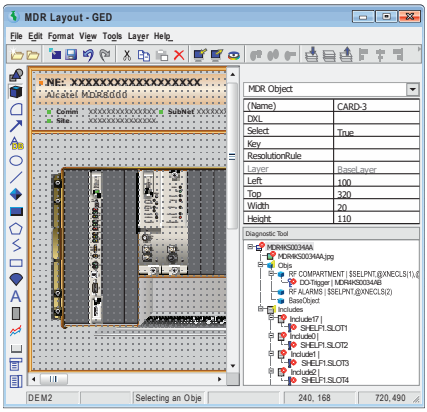


SMART SCRIPT MANAGER

Smart Script is the scripting language that interfaces with the Telenium database and with local and network applications such as Microsoft Excel, Access and SQL databases, enabling the user to write and execute complex queries and commands through a GUI interface.



GRAPHICAL EDITOR (GED)

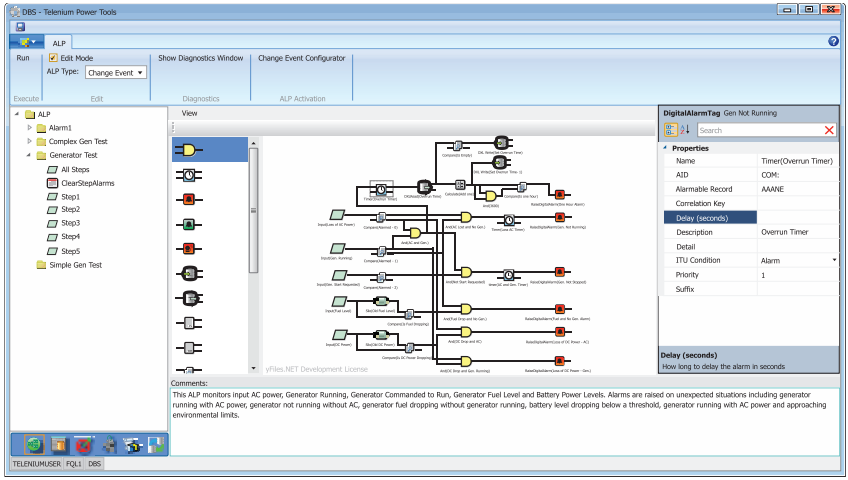


GED is a Telenium module that provides a development environment for creating maps and equipment displays, enabling users to create custom graphics based on their needs.

ADVANCED LOGIC PROCESSOR

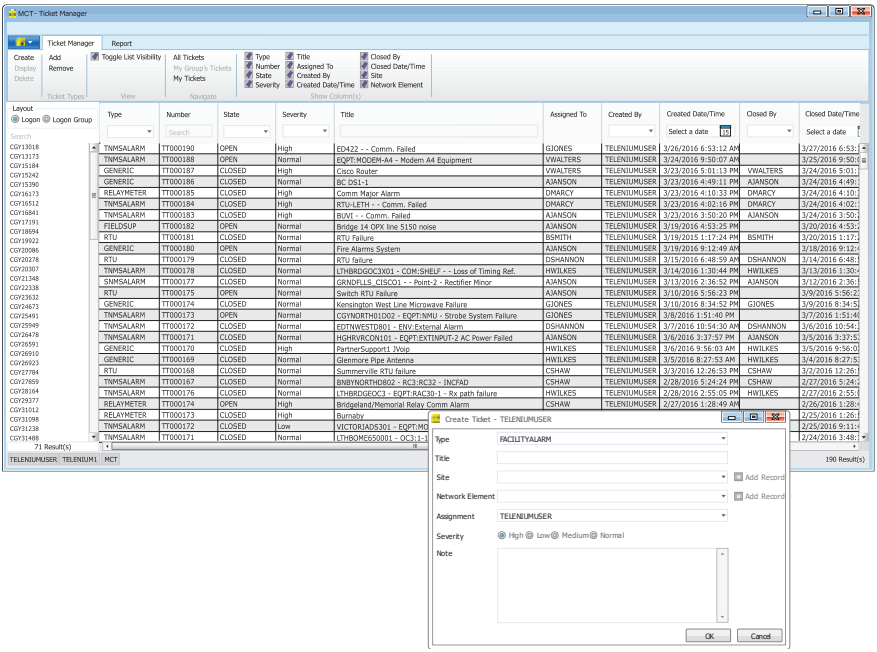
Regulatory Compliance

Advanced Logic Processor is a new application to the Telenium suite that enables the designing of logic procedures (ALPs) that trigger based on any combination of events, including detection of alarms, changes to database fields, expiration of timers, and ON/OFF indicators. Activation of the ALP can generate alarms, modify database fields, execute scripts, or perform complex correlations.



TICKET MANAGER

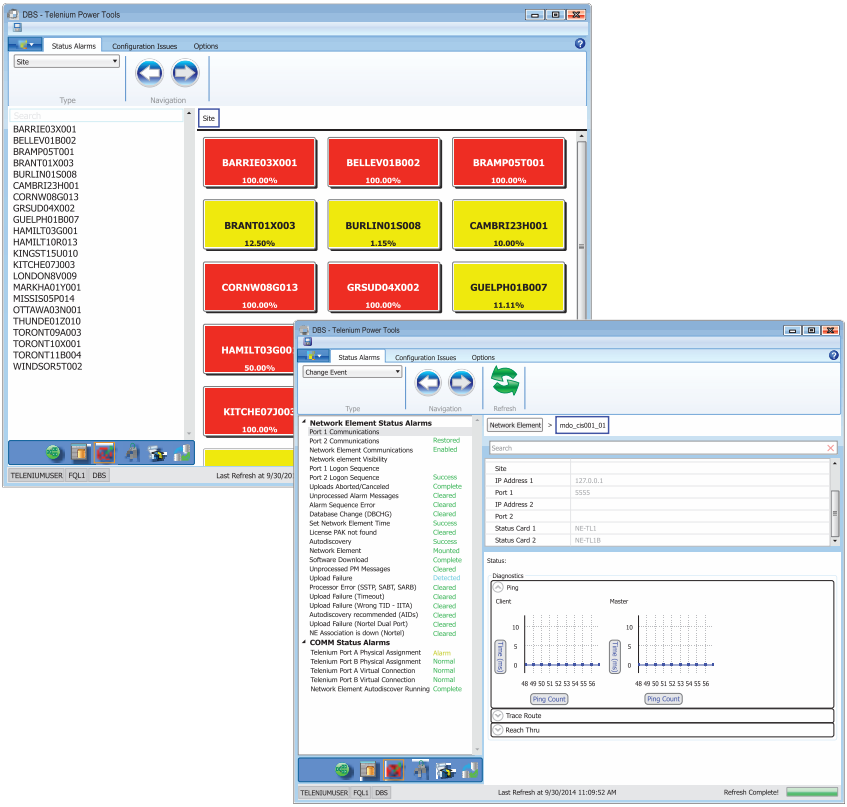
Ticket Manager works with Alarm Chrono to provide dynamic ticket generation for network elements managed by the database. Create, edit, view, and report on alarms and trouble resolutions with Telenium tickets.



DIAGNOSTIC AND RESOLUTION TOOL (DART)

Regulatory Compliance

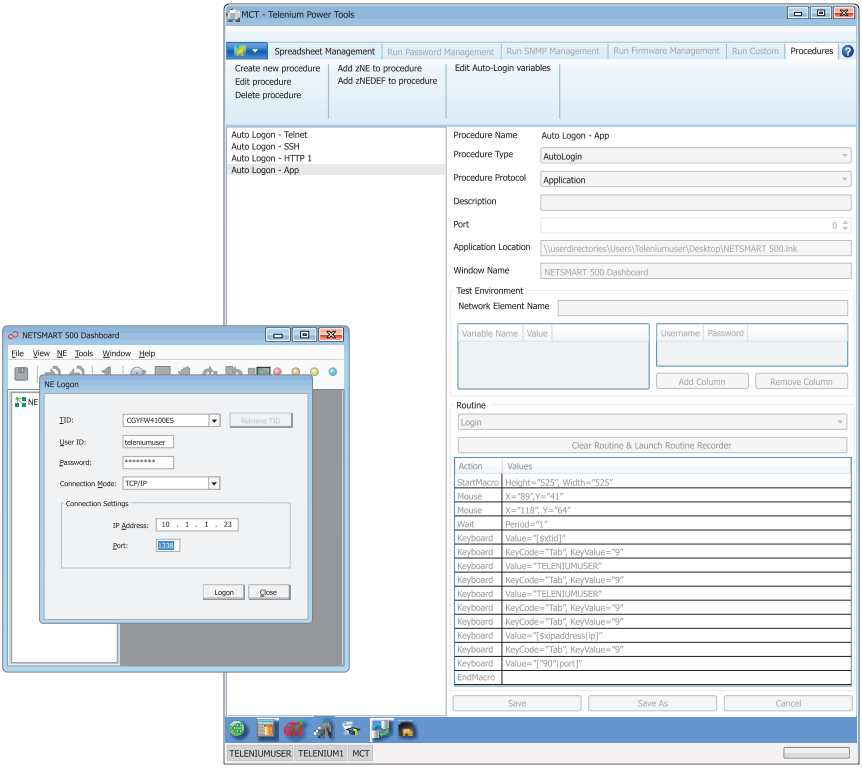
DART is a suite of advanced Telenium tools designed to assist operators and technicians with detecting, diagnosing, and resolving network connectivity issues. DART also provides a real-time view of communication outages for NERC/CIP compliance to site isolation events and generates additional alarms should more than a specific percentage of network elements at a site become unreachable or unresponsive.



AUTO LOGON

Regulatory Compliance

Login to network elements' management interfaces via SSH, Telnet, http/https or even by launching the manufacturer's own application. User account and passwords are automatically passed to the management application and protected from the operator's view.



Chapter 9:
Experience The Telenium Advantage

Telenium offers a comprehensive solution to organizations that demand a flexible, scalable, and reliable network management system.

Superior Service Management

Telenium automatically determines how your circuits are routed through your network. Having a real-time accurate view of the circuit routing provides a significant cost and service advantage.

Alarms are automatically correlated to circuits, facilities, and customers; services and accounts are interrelated with customers; and all services are linked and displayed on the appropriate equipment and facilities.

The Telenium service manager can also assist with the design of new circuits by locating available bandwidth based on the circuit requirements.

SYSTEM SCALABILITY

Telenium will continue to deliver comprehensive network surveillance, configuration, and management as your system grows. National and international telecommunications networks with tens of thousands of managed devices use the same baseline Telenium software as smaller regional installations.

PRODUCT VERSATILITY

Telenium is fully configurable to address the specific requirements of your business processes and your users. Menus, alarm colors, graphics screens, alarm priorities, user privileges, notification escalations, and many other features are completely customizable to suit your network management processes.

MULTI-VENDOR COMPATIBILITY

Telenium supports a broad range of network element vendors, devices, and protocols. We are continually adding to our inventory of supported network elements to fulfill our customers' requirements.

3COM
4RF Communications
Accedian
Acme Packet
ADC Telecommunications
ADTRAN, Inc.
ADVA
Advantech Wireless
Airspan
Alcatel
Alcatel/Lucent
Alcatel/Newbridge
Allied Telesyn
Alpha Technologies
AMETEK
APC
Apcon
Appian Communications
Applied Innovation Inc.
Argus
Asentria
AT&T
Austron
Avaya
Aviat
Avtec
Badger
Bard
Bay Networks
Bayly
Best Power
Bestlink
Brocade
BTI Systems
C&D Technologies
Cabletron Systems
CalAmp
Calient
Calix
Cambium Networks
Carrier Access
Ceragon
Cerent
Ceterus
Charles Industries
Ciena
Cisco
CNT
Coastcom
Compatible Systems Corp
COMSAT
Comtech
Cordell
Coriant
Corvis
CXR Larus
Cyan
Dantel
Datum
Dedicated Networks Partners
DELL
Digi
Digital Link

Digital Solar Technologies
DMC Stratex
DPS Telecom
DSC
Dymec-Dynastar
Eastern Research Inc.
Eaton
ECI Tel
EFDATA
Ekinops
Electrospace
Eltek-Valere
Emerson Networks
Encore
Ericsson
ETS
Exalt
EXFO
Extreme Networks
Fial
Fore
Fujitsu
GarrettCom
GE
Generix
GRC
Haliplex
Harris
IBM
Infinera
Intelect
ION Networks
Ipitek
IRIS
ITL
JPS Communications
Juniper Networks
Landis+Gyr
Larscom
Larus
LightPointe
Lineage Power
Loop Telecom
Lortec
Lucent
Lumentum
MAHI
Marconi
MetaSwitch
Metro-Optix
Microwave Data Systems
Microwave Networks
Milgo
Mitsubishi
Moseley
Motorola
Movaz
MRV
Multitech
NEC
Netgear
Nicad
NICE
Nokia
Noran Tel
Nortel
Occam
Ocular Networks
Omnitron
Omnitronics
OneAC
ONI Systems
Optelian
Optisphere
Oscilloquartz
OSICOM
Perle
Phoenix Broadband
Pirelli
PowerAgent
PowerTrunk
Premisys
Proxim Wireless
Puregas
Racal
RAD Data Communications
RADwin
Radyne
RBNi
Redback
Redline
RFL
Rockwell
RuggedCom
Safetran
SEL
Sensatronics
Sensus
Sentinel
ServerTech
Servo
Sherrex
Siemens
Silver Spring Networks
SixNET
Sorrento
Spectrum
Sycamore Networks
Symmetricom
Tadiran ECI
Tait Communications
TC Communications
Technostrobe
Tekron
Telco Systems
Telect
Telectronic
Telica
Tellabs
Telmar
Timeplex
Transmode
Turin Networks
Varian
Voyant
Westronic
Xel Communications, Inc
Zhone Technologies

Don’t see your network element manufacturer on our list?

Contact us at (403) 295-0511 or sales@megasys.com as we are continually adding supported vendors to the Telenium suite.

RELIABILITY

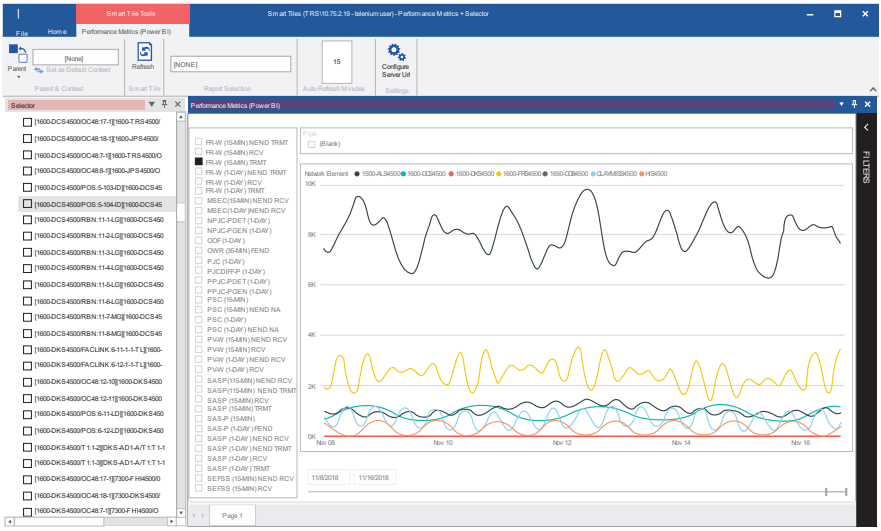
In network management, reliability is vital. Telenium addresses this requirement by implementing numerous strategies:

- Appliances are configured with hardware fault tolerance including RAIDed disks and redundant hot-swappable power supplies.
- The Telenium software monitors the appliance for disk errors and excessive system loading.
- The integrated Telenium watchdog ensures all key Telenium applications are operating properly.
- Escalation of alarms ensures round-the-clock management of your network, and quality of service configuration and reporting identifies potential issues with service level agreement commitments.
- Critical geographical fault tolerance is achieved with Telenium's database synchronization. All cooperating Telenium appliances are always current, and in the case of a malfunction, failover and subsequent resynchronization is automatically achieved.

TELENIUM PERFORMANCE METRICS

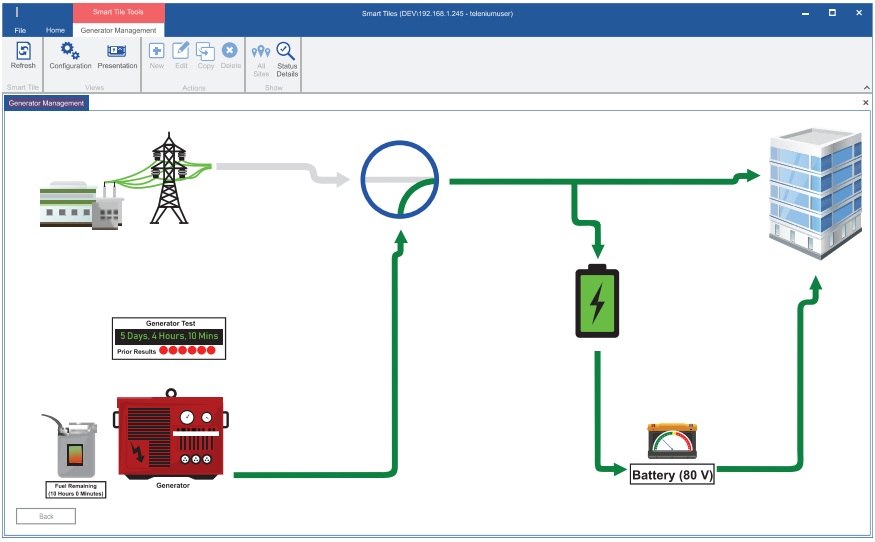
The utility industry is requiring increasingly high network performance and quality of service. Telenium collects performance data and defined KPIs from multiple vendor devices across the network and stores the information in a format that can be digested by analytics engines for the consumption of IT, OT, corporate users, and other utility stakeholders. Error rates, receive signal levels, latency, jitter, network availability: these statistics and more are used for strategic network management, SLA compliance, and network diagnostics.

Telenium Power PM offers configurable alarm thresholds to ensure that performance data outside acceptable ranges alert the appropriate operations centers for proactive diagnosis and resolution of potential network issues or to alert when service level agreement parameters are approaching.



TELENIUM GENERATOR MANAGEMENT

The Telenium Generator Management Smart Tile has been developed to profile and manage all the various components related to site power availability. This includes profiling the generator, fuel source, transfer switch, and battery chargers as well as DC power plant and AC power availability. This profiling technology allows the Telenium system to proactively monitor weekly generator testing, determine fuel availability, and validate that the entire power recovery components are working as required.



Sophisticated logic processes analyze all available data along with operator provided information to generate alarms in the Telenium dashboard for any number of events including:

- Generator running with no AC power failure outside of the gen-test period.
- Generator fuel levels and calculation of run-time remaining.
- Fuel levels declining unexpectedly such as when the generator is not running.
- Failed weekly generator tests such as a test that did not run, ran too short, or ran too long.
- Battery chargers not showing that the battery array is in a charge mode rather than a discharge mode.
- Transfer switches not switching to the generator when AC power is lost and the generator is running.
- Automatic RICE report generation.

History of all power related system events is maintained in the Telenium database for post analysis and historical analysis requirements.

MULTIPLE LANGUAGE SUPPORT

The Telenium system supports 8 bit Unicode Transformation Format data encoding so that information can be stored and displayed in multiple languages.

EXTENDED SUPPORT

MegaSys offers a variety of Telenium Extended Support Services (ESS) options that provide long-term sustainability and enhance the operation of the Telenium system. ESS benefits include:

- Software Upgrades – All licensed product upgrades including access to multiple versions of your network element models and the latest Telenium suite.
- Telenium LAB License – ESS subscribers can assess and test any Telenium product in a non-production environment.
- Documentation – MegaSys provides extensive documentation and computer-based training describing how to use and manage your Telenium system. This information is available in both hard copy and online formats.
- Technical Support – Our skilled support MegaSys staff is available to assist you with mission critical problems 24 hours a day. Trouble tickets can be submitted via e-mail, fax, phone, or our web based trouble ticketing system.
- Web Support – Access the latest software and documentation updates from our web support page. You can also enter or review current and past trouble tickets.

Contact us today to discover how you can experience the Telenium advantage.

E-mail general.inquiries@megasys.com,
or reach us by phone at (403) 295-0511.