



# EMS SmartView™

Superior Design with Real-Time Monitor and Control

## Fault Management

- Trap Collection
- Active Alarm
- Alarms sent by E-mail & SMS

## Configuration Management

- Network Topology
- Network Element Discovery
- Network Element Configuration

## Accounting Management

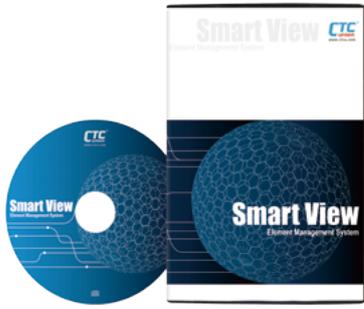
- Location, status and serial numbers of all assets can be managed and exported

## Performance Management

- Device Performance is plotted over time using standard PM data such as ES UAS, etc.

## Security Management

- User Privilege
- User Activity



# EMS SmartView™

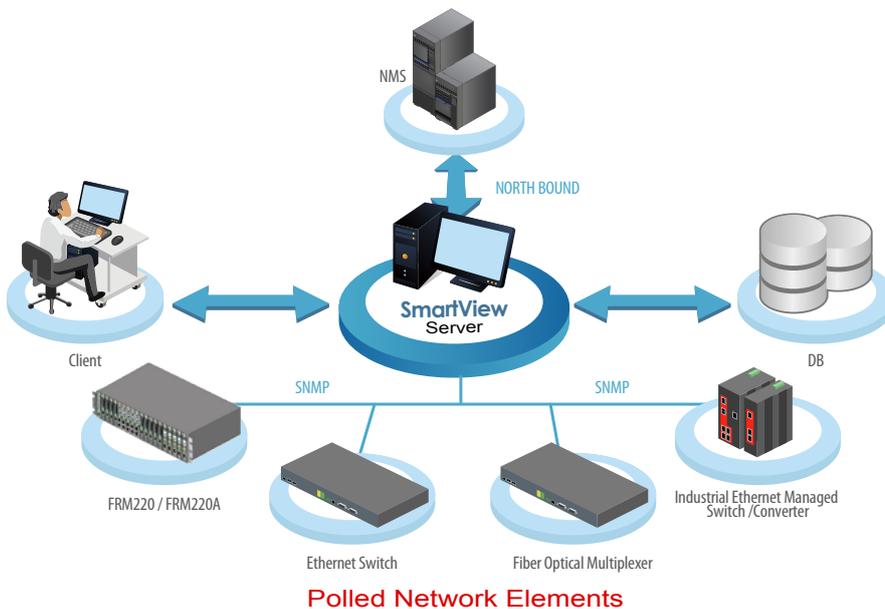
## Element Management System

- Centralized Network Management Platform
- Real-time visual representations and processing of alarms
- Easy and User-Friendly Operation Interface
- Long term event storage

- Remote access control for efficient configuration
- Traffic / Performance monitoring and management
- Alarm Trap and event log management

- Auto Discovery and Device Viewer
- Allow up to 25 administrators to login
- Applied to CTC Union's Main Products

### Network Scheme Diagram



- User-Friendly Operation Interface
- Robust Client / Server architecture
- Network Monitoring and Management
- Database for persistent event storage
- Security Access Management

### Agents

All of CTC Union's SNMP enabled products, such as FRM220/220A platform, FMUX series of fiber multiplexers and Industrial series L2 managed switch are manageable by CTC Union SmartView™ EMS management Platform.

### SmartView™ Server

The server handles connection with the network devices using SNMP protocol, and is responsible for communication of requests from management clients. SmartView™ Server collects the information data from specific SNMP agents, stores the information into a persistent database and updates that information to the management clients.

### Microsoft® SQL Server for Persistent Storage

SQL Server is the place where the SmartView™ collected data, such as alarms, traps and user actions is stored for long term retrieval. SmartView™ requires Microsoft® SQL Server and is compatible with SQL Server 2005, SQL 2005 Express, SQL 2008 Server, SQL 2008 Express, SQL 2012 Server and SQL 2012 Express. (The EMS installer will install the free version Microsoft® SQL 2008 Express by default.)

### Workstation-Clients

Management clients are provided with the JAVA applet GUI to monitor and control the agents at far end. They also receive the Alarm and Traps from the corresponding SNMP Agents. Multiple workstations are allowed, with a maximum of 25 concurrent logged in users.

## Features at a Glance

### Fault Management

#### Trap Collection

All traps will be stored in SQL database. When an SNMP agent experiences an abnormal condition it will send an SNMP trap message to SmartView™ which then receives the message, and records it in the database. Depending on preset conditions, SmartView™ may sound an audible alarm, send an email or SMS alert message or just simply flash the trap message on the administrative console screen.

| No. | Ack | Time                | Device    | Address   | Message  |
|-----|-----|---------------------|-----------|-----------|--|
| 1   | ✓   | 2013-10-31 16:43:25 | FRM220-44 | 10.1.1.44 | Chassis1, Slot06, Local: Fiber Link Down.              |
| 2   | ✓   | 2013-10-31 16:43:25 | FRM220-44 | 10.1.1.44 | Chassis1, Slot07, Local: Fiber Link Down.              |
| 3   | ✓   | 2013-10-31 16:43:25 | FRM220-44 | 10.1.1.44 | Chassis1, Slot10, Local: Fiber1 Link Down.             |
| 4   | ✓   | 2013-10-31 16:43:25 | FRM220-44 | 10.1.1.44 | Chassis1, Slot10, Local: Fiber2 Link Down.             |
| 5   | ✓   | 2013-10-31 16:43:25 | FRM220-44 | 10.1.1.44 | Chassis1, Slot11, Local: Fiber Link Down.              |
| 6   | ✓   | 2013-10-31 16:43:25 | FRM220-44 | 10.1.1.44 | Chassis1, Slot11, Local: UTP Link Down.                |
| 7   | ✓   | 2013-10-31 16:43:26 | FRM220-44 | 10.1.1.44 | Chassis1, Slot12, Local: Fiber Link Down.              |
| 8   | ✓   | 2013-10-31 16:43:26 | FRM220-44 | 10.1.1.44 | Chassis1, Slot12, Local: UTP Link Down.                |
| 9   | ✓   | 2013-10-31 16:43:26 | FRM220-44 | 10.1.1.44 | Chassis1, Slot13, Local: UTP Link Down.                |
| 10  | ✓   | 2013-10-31 16:43:26 | FRM220-44 | 10.1.1.44 | Chassis1, Slot13, Local: Fiber2 Link Down.             |
| 11  | ✓   | 2013-10-31 16:43:26 | FRM220-44 | 10.1.1.44 | Chassis1, Slot13, Local: Fiber3 Link Down.             |
| 12  | ✓   | 2013-10-31 16:43:26 | FRM220-44 | 10.1.1.44 | Chassis1, Slot15, Local: UTP Link Down.                |
| 13  | ✓   | 2013-10-31 16:43:26 | FRM220-44 | 10.1.1.44 | Chassis1, Slot15, Local: E1 Signal Loss.               |
| 14  | ✓   | 2013-10-31 16:43:26 | FRM220-44 | 10.1.1.44 | Chassis1, Slot16, Local: UTP Link Down.                |
| 15  | ✓   | 2013-10-31 16:43:26 | FRM220-44 | 10.1.1.44 | Chassis1, Slot16, Local: E1 Signal Loss.               |
| 16  | ✓   | 2013-10-31 16:43:26 | FRM220-44 | 10.1.1.44 | Chassis1, Slot17, Local: Fiber Link Down.              |
| 17  | ✓   | 2013-10-31 16:43:26 | FRM220-44 | 10.1.1.44 | Chassis1, Slot17, Local: UTP Link Down.                |
| 18  | ✓   | 2013-10-31 16:43:26 | FRM220-44 | 10.1.1.44 | Chassis1, Slot18, Local: Fiber Link Down.              |
| 19  | ✓   | 2013-10-31 16:43:26 | FRM220-44 | 10.1.1.44 | Chassis1, Slot18, Local: UTP Link Down.                |
| 20  | ✓   | 2013-10-31 16:43:26 | FRM220-44 | 10.1.1.44 | Chassis1, Slot19, Local: Fiber Link Down.              |
| 21  | ✓   | 2013-10-31 16:43:26 | FRM220-44 | 10.1.1.44 | Chassis1, Slot19, Local: UTP Link Down.                |
| 22  | ✓   | 2013-10-31 16:43:26 | FRM220-44 | 10.1.1.44 | Chassis1, Slot20, Local: Fiber Link Down.              |
| 23  | ✓   | 2013-10-31 16:43:27 | FRM220-44 | 10.1.1.44 | Chassis1, Slot20, Local: UTP Link Down.                |
| 24  | ✓   | 2013-10-31 16:43:27 | FRM220-44 | 10.1.1.44 | Chassis1, Slot02, Local: Card FRM220A-1000EAS/X Found. |
| 25  | ✓   | 2013-10-31 16:43:27 | FRM220-44 | 10.1.1.44 | Chassis1, Slot03, Local: Card FRM220A-1000EAS/X Found. |
| 26  | ✓   | 2013-10-31 16:43:27 | FRM220-44 | 10.1.1.44 | Chassis1, Slot04, Local: Card FRM220A-1000EAS/X Found. |
| 27  | ✓   | 2013-10-31 16:43:39 | FRM220-44 | 10.1.1.44 | Chassis1, Slot05, Local: Card FRM220A-1000EAS/X Found. |
| 28  | ✓   | 2013-10-31 16:44:10 | FRM220-44 | 10.1.1.44 | Chassis1, Slot02, Local: Fiber1 Link Down.             |
| 29  | ✓   | 2013-10-31 16:44:10 | FRM220-44 | 10.1.1.44 | Chassis1, Slot02, Local: Fiber2 Link Down.             |

Trap Messages

#### Active Alarm

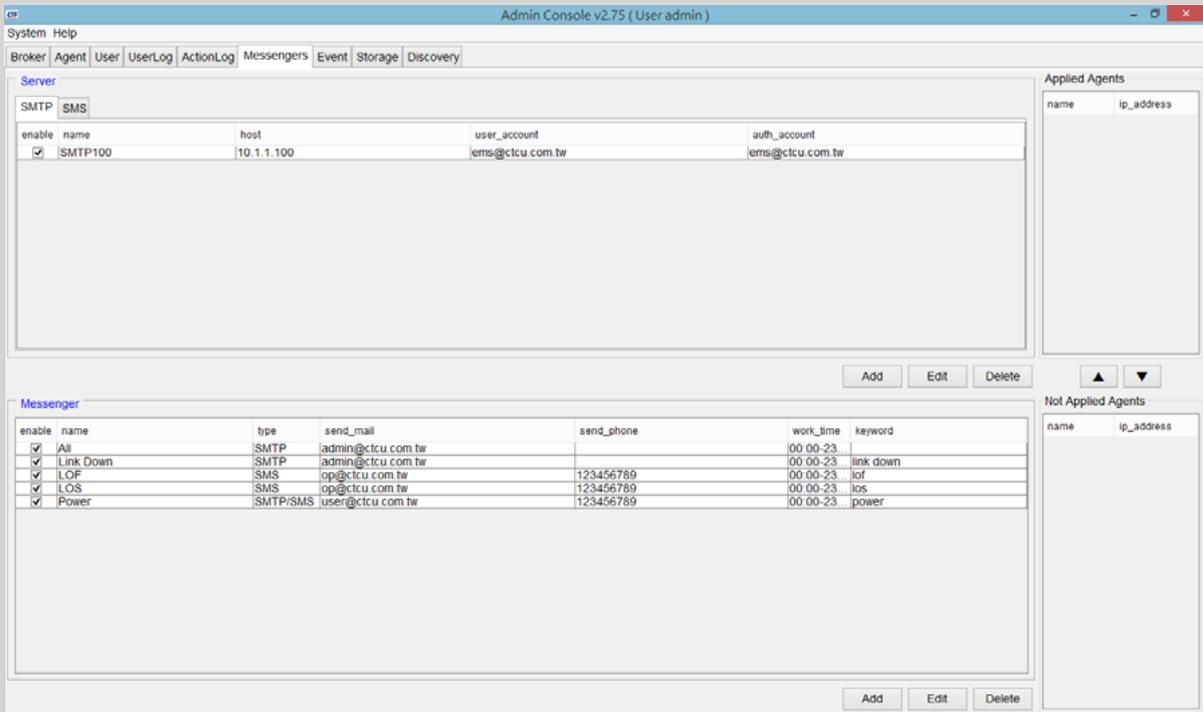
SmartView™ continuously polls all network devices under its management and will visually display all alarm conditions found. Alarms will be categorized as Major, Minor or Warning, depending on severity. Although alarms may be acknowledged, they remain actively displayed on the alarm page until they no longer have an alarm condition.

| No. | Ack | Time                | Device     | Address   | Location            | Message                                | Severity |
|-----|-----|---------------------|------------|-----------|---------------------|--|----------|
| 1   | ✓   | 2013-10-31 16:40:28 | FMUX04E-43 | 10.1.1.43 | Local               | Fiber2 port has no link.               | Warning  |
| 2   | ✓   | 2013-10-31 16:48:28 | FMUX04E-43 | 10.1.1.43 | Local               | E1 channel CH1 inactive.               | Warning  |
| 3   | ✓   | 2013-10-31 16:48:28 | FMUX04E-43 | 10.1.1.43 | Local               | E1 channel CH2 inactive.               | Warning  |
| 4   | ✓   | 2013-10-31 16:48:28 | FMUX04E-43 | 10.1.1.43 | Local               | E1 channel CH3 inactive.               | Warning  |
| 5   | ✓   | 2013-10-31 16:48:28 | FMUX04E-43 | 10.1.1.43 | Local               | E1 channel CH4 inactive.               | Warning  |
| 6   | ✓   | 2013-10-31 16:48:28 | FMUX04E-43 | 10.1.1.43 | Local               | RS232 port inactive.                   | Warning  |
| 7   | ✓   | 2013-10-31 16:48:28 | FMUX04E-43 | 10.1.1.43 | Local               | LAN2 port inactive.                    | Warning  |
| 8   | ✓   | 2013-10-31 16:49:30 | FMUX04E-43 | 10.1.1.43 | Local               | LAN3 port inactive.                    | Warning  |
| 9   | ✓   | 2013-10-31 17:06:01 | FMUX04E-43 | 10.1.1.43 | Remote              | ES error (Error seconds).              | Minor    |
| 10  | ✓   | 2013-10-31 17:04:36 | FMUX04E-43 | 10.1.1.43 | Remote              | Fiber2 port has no link.               | Warning  |
| 11  | ✓   | 2013-10-31 17:04:36 | FMUX04E-43 | 10.1.1.43 | Remote              | E1 channel CH1 inactive.               | Warning  |
| 12  | ✓   | 2013-10-31 17:04:36 | FMUX04E-43 | 10.1.1.43 | Remote              | E1 channel CH2 inactive.               | Warning  |
| 13  | ✓   | 2013-10-31 17:04:36 | FMUX04E-43 | 10.1.1.43 | Remote              | E1 channel CH3 inactive.               | Warning  |
| 14  | ✓   | 2013-10-31 17:04:36 | FMUX04E-43 | 10.1.1.43 | Remote              | E1 channel CH4 inactive.               | Warning  |
| 15  | ✓   | 2013-10-31 17:04:36 | FMUX04E-43 | 10.1.1.43 | Remote              | RS232 port inactive.                   | Warning  |
| 16  | ✓   | 2013-10-31 17:04:36 | FMUX04E-43 | 10.1.1.43 | Remote              | LAN1 port inactive.                    | Warning  |
| 17  | ✓   | 2013-10-31 17:04:36 | FMUX04E-43 | 10.1.1.43 | Remote              | LAN2 port inactive.                    | Warning  |
| 18  | ✓   | 2013-10-31 17:04:36 | FMUX04E-43 | 10.1.1.43 | Remote              | LAN3 port inactive.                    | Warning  |
| 19  | ✓   | 2013-10-31 17:04:36 | FMUX04E-43 | 10.1.1.43 | Remote              | Phone port inactive.                   | Warning  |
| 20  | ✓   | 2013-10-31 16:43:25 | FRM220-44  | 10.1.1.44 | Rack:1 Slot:1 Local | Power is not working or not installed. | Minor    |
| 21  | ✓   | 2013-10-31 16:43:25 | FRM220-44  | 10.1.1.44 | Rack:1 Slot:1 Local | Fan1 is not working or not installed.  | Minor    |
| 22  | ✓   | 2013-10-31 16:43:25 | FRM220-44  | 10.1.1.44 | Rack:1 Slot:1 Local | Alarm1 setting is in alarm.            | Minor    |
| 23  | ✓   | 2013-10-31 16:43:25 | FRM220-44  | 10.1.1.44 | Rack:1 Slot:1 Local | Alarm2 setting is in alarm.            | Minor    |
| 24  | ✓   | 2013-10-31 16:43:58 | FRM220-44  | 10.1.1.44 | Rack:1 Slot:2 Local | Fiber1 port has no link.               | Major    |
| 25  | ✓   | 2013-10-31 16:43:58 | FRM220-44  | 10.1.1.44 | Rack:1 Slot:2 Local | Fiber2 port has no link.               | Major    |
| 26  | ✓   | 2013-10-31 16:43:58 | FRM220-44  | 10.1.1.44 | Rack:1 Slot:2 Local | UTP3 port has no link.                 | Major    |
| 27  | ✓   | 2013-10-31 16:43:58 | FRM220-44  | 10.1.1.44 | Rack:1 Slot:2 Local | UTP4 port has no link.                 | Major    |
| 28  | ✓   | 2013-10-31 16:43:58 | FRM220-44  | 10.1.1.44 | Rack:1 Slot:3 Local | Fiber1 port has no link.               | Major    |
| 29  | ✓   | 2013-10-31 16:43:58 | FRM220-44  | 10.1.1.44 | Rack:1 Slot:3 Local | Fiber2 port has no link.               | Major    |

Active Warnings

### Alarms sent by E-mail & SMS

The SmartView™ is capable of sending emails and or SMS text messages to selected administrators when critical alarms occur. Prompt notification of system problems aid in getting problems in the network fixed in the shortest time possible.

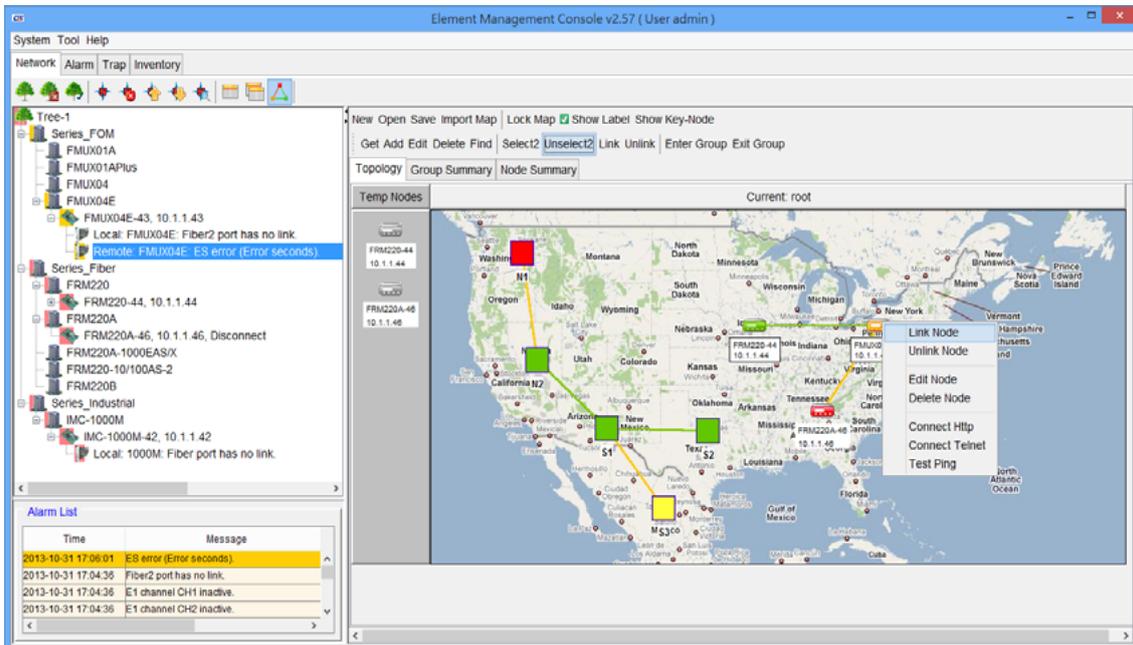


Alarms Sent by Email & SMS

## Configuration Management

### Network Topology

User can load maps to SQL server, load maps from SQL server or delete attached maps. Download procedure is very simple. Map area may be used to layout any objects from Root and Node panel. Using drag-and-drop, put any object to map area. Any label or network element location name may be added to object. Objects in red color indicate some alarm condition is present in the device. Right clicking an object brings a popup window to select Telnet or http management directly.



Network Topology

## Network Element Configuration

SmartView™ is able to provide a single point of configuration for the network elements. Most settings only require mouse clicks and by using a tab format, most scrolling is eliminated. Current settings and status are displayed along with hardware and firmware versions for each element.

The screenshot shows the 'Element Management Console v2.75 (User admin)' interface. On the left, a tree view shows the network hierarchy: Products > Series\_Fiber > FRM220 > Rack 1 > Local > Slot 5: 1000EAS/X: Fiber2 Link Down. The main area displays configuration for Slot 5, including a table with columns Name, Rack, Slot, and Site. Below this are function keys (Apply, Refresh, Device Reset, etc.) and tabs for Device, Fiber 1, Fiber 2, UTP 3, UTP 4, 802.1Q VLAN, IP Address, Counters, and SFP. The 'Setting' tab is active, showing options for Device Active, IP Address, Remote TLPT, and Advance Functions. A 'VLAN' section shows Port VLAN set to 'disable' and a table for ITEM, Port 1-4, and Management. An 'Alarm List' is visible at the bottom left, showing recent fiber link down events.

Network Element Configuration

## Network Element Discovery

SmartView™ has a tool for automatically discovering SNMP agents on the network. Simply enter an IP address range and the discovery program will ping every IP address looking for SNMP agents. Once discovered, the agents can be selected and brought into the broker for polling.

The screenshot shows the 'Admin Console v2.75 (User admin)' interface for Network Element Discovery. It features a 'Search Range' section with IP From (10.1.1.1) and To (10.1.1.254) fields, and an 'SNMP Setting' section with Community String (public), Port (161), and Timeout Second (1) fields. Below these are two tables: 'Device Managed' (currently empty) and 'Device Discovered'. The 'Device Discovered' table lists discovered devices with columns for IP, SysName, SysLocation, SysDescr, Type, and Manage. The status bar at the bottom shows 'Status: Searching ... 10.1.1.93' and 'Start Search' / 'Stop Search' buttons.

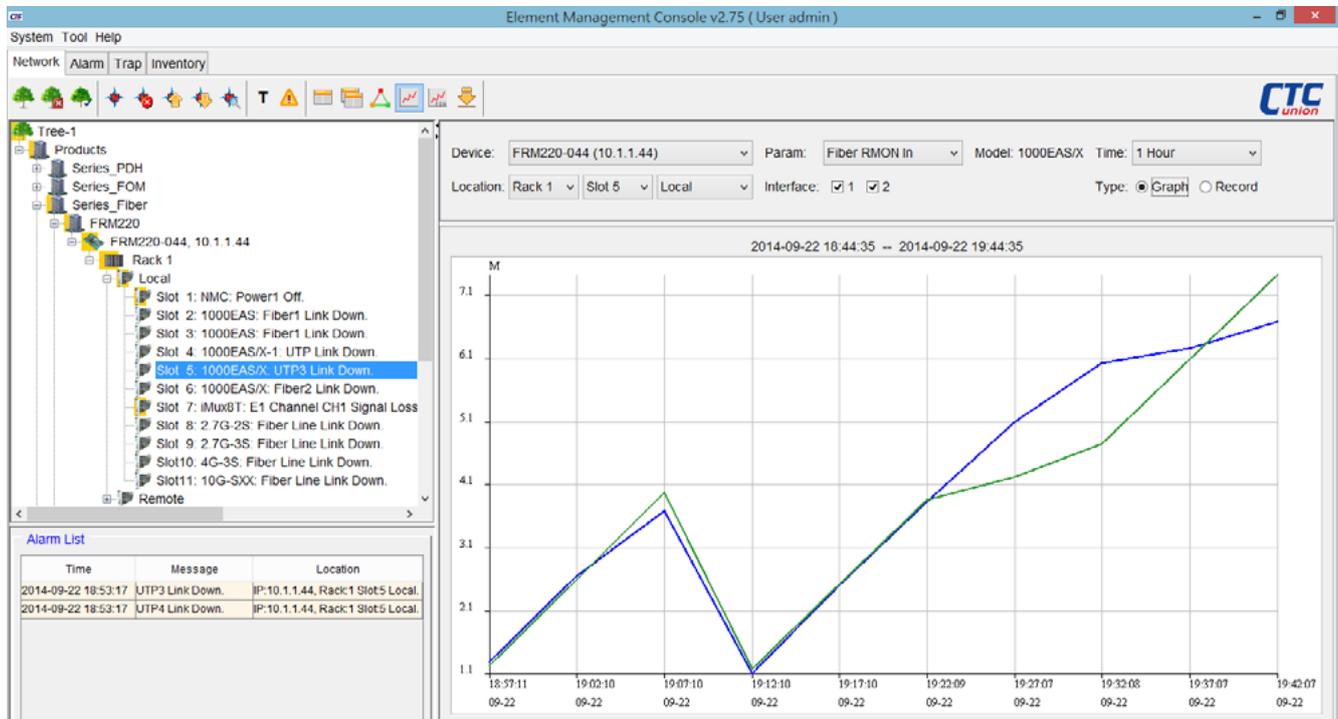
| IP        | SysName    | SysLocation | SysDescr                                       | Type              | Manage                   |
|-----------|------------|-------------|--|-------------------|--------------------------|
| 10.1.1.1  | ctcu       | Unknown     | OAM/IP Gigabit Ethernet Media Converter/Switch | FRM220A-1000EAS/X | <input type="checkbox"/> |
| 10.1.1.41 |            |             | IGS-803SM Gigabit Ethernet Switch              | IFS/IGS-803SM     | <input type="checkbox"/> |
| 10.1.1.44 | NMC        | Unknown     | Linux 2.4.20-uc0 #28580                        | FRM220            | <input type="checkbox"/> |
| 10.1.1.56 |            |             | MSW202 Gigabit Ethernet Switch                 | MSW202            | <input type="checkbox"/> |
| 10.1.1.58 |            |             | FRM220A 28x1G Ethernet Switch                  | FRM220A           | <input type="checkbox"/> |
| 10.1.1.69 | GOM-16E1-M | Unknown     | Fiber Multiplexer                              | FMUX1600          | <input type="checkbox"/> |
| 10.1.1.85 |            |             | FRM220A 28x1G Ethernet Switch                  | FRM220A           | <input type="checkbox"/> |

Network Element Discovery



## Performance Management

SmartView™ is able to monitor device performance parameters through polling of specific OIDs. Graphs of performance information (for example PDH PM data such as ES, UAS, etc. as well as hardware parameters such as fan speed, temperature, optical Tx/Rx power or RMON counters) can be generated on an X Y axis showing different trend data.



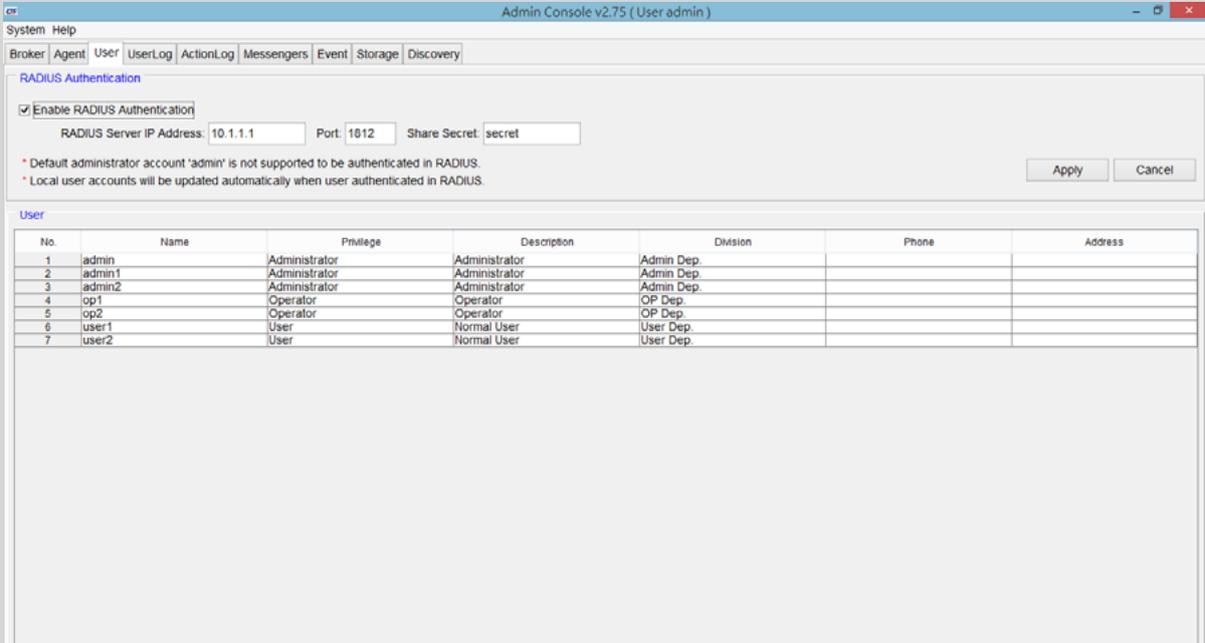
Performance Records

| No. | Device     | Address   | Type   | Location              | Time                | Param         | Interface | Value   |
|-----|------------|-----------|--------|-----------------------|---------------------|---------------|-----------|---------|
| 1   | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 18:57:11 | Fiber RMON In | 1         | 1331040 |
| 2   | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 18:57:11 | Fiber RMON In | 2         | 1270944 |
| 3   | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 19:02:10 | Fiber RMON In | 1         | 2677120 |
| 4   | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 19:02:10 | Fiber RMON In | 2         | 2621536 |
| 5   | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 19:07:10 | Fiber RMON In | 1         | 3711872 |
| 6   | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 19:07:10 | Fiber RMON In | 2         | 4005216 |
| 7   | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 19:12:10 | Fiber RMON In | 1         | 1132512 |
| 8   | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 19:12:10 | Fiber RMON In | 2         | 1210720 |
| 9   | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 19:17:10 | Fiber RMON In | 1         | 2538752 |
| 10  | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 19:17:10 | Fiber RMON In | 2         | 2547776 |
| 11  | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 19:22:09 | Fiber RMON In | 1         | 3869792 |
| 12  | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 19:22:09 | Fiber RMON In | 2         | 3887840 |
| 13  | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 19:27:07 | Fiber RMON In | 1         | 5125632 |
| 14  | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 19:27:07 | Fiber RMON In | 2         | 4259328 |
| 15  | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 19:32:08 | Fiber RMON In | 1         | 6058112 |
| 16  | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 19:32:08 | Fiber RMON In | 2         | 4776704 |
| 17  | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 19:37:07 | Fiber RMON In | 1         | 6298752 |
| 18  | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 19:37:07 | Fiber RMON In | 2         | 6116768 |
| 19  | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 19:42:07 | Fiber RMON In | 1         | 6715360 |
| 20  | FRM220-044 | 10.1.1.44 | FRM220 | Rack:01 Slot:05 Local | 2014-09-22 19:42:07 | Fiber RMON In | 2         | 7452320 |

## Security Management

### User Privilege

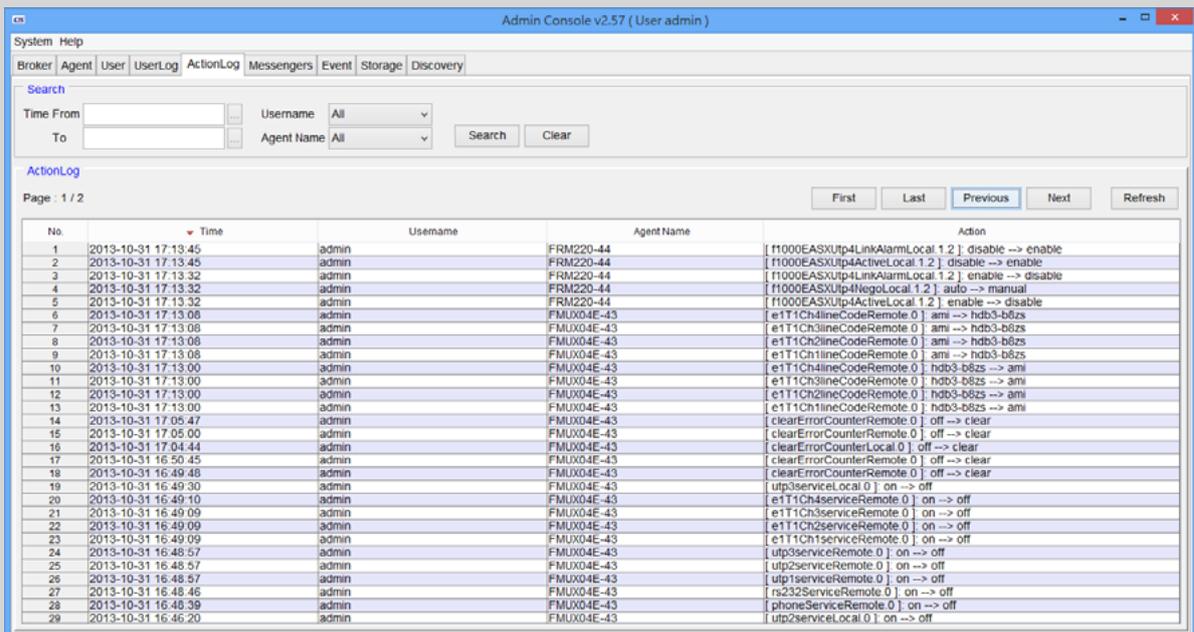
- The administrator can add necessary user logins with specific privileges, from Administrator to Operator and lastly to normal user.
- Radius Authentication. Supports authentication login provided by credentials stored on RADIUS server.



User Privilege

### User Activity

Provides viewing and clearing of the user login and configuration action logs. User client login & logouts is recorded including the client's source IP address. All activities performed on any Network Element are logged with time-stamping, the user making changes and the changes made.



User Activity

## Requirements

| SmartView™                 | Hardware (minimum)   | Software   | Operating System                                 |
|----------------------------|--|--|--|
| <b>SmartView™ Server</b>   | Intel Core2 or higher processor, 4GB RAM, HD >2GB (free).  | JAVA JRE. SmartView™ Kit.                          | Windows 2008/2012 Server, Windows Vista, Win 7/8 |
| <b>SQL Database Server</b> | Intel Core2 or higher processor, 4GB RAM, HD >2GB (free).  | MS-SQL Server 2008/2012                            | Windows 2008/2012 Server, Windows Vista, Win 7/8 |
| <b>Workstation-Clients</b> | Intel Core2 or higher processor, 4GB RAM, HD >2GB (free).  | JAVA JRE. SmartView™ Kit.                          | Windows Vista, Win 7/8                           |
| <b>All-In-One</b>          | Intel Core2 or higher processor, 8GB RAM, HD >20GB (free). | JAVA JRE. MS-SQL Server 2008/2012. SmartView™ kit. | Windows 2008/2012 Server, Windows Vista, Win 7/8 |

## Ordering Information

### SmartView™ Platform Server with Device Agents

| Model Name        | Description                                |
|-------------------|--|
| <b>SV-AGT-50</b>  | SmartView™ Platform with 50 device agents  |
| <b>SV-AGT-100</b> | SmartView™ Platform with 100 device agents |
| <b>SV-AGT-200</b> | SmartView™ Platform with 200 device agents |
| <b>SV-AGT-500</b> | SmartView™ Platform with 500 device agents |

SV - □□□ - □□□□  
 Example: SV - AGT - 100