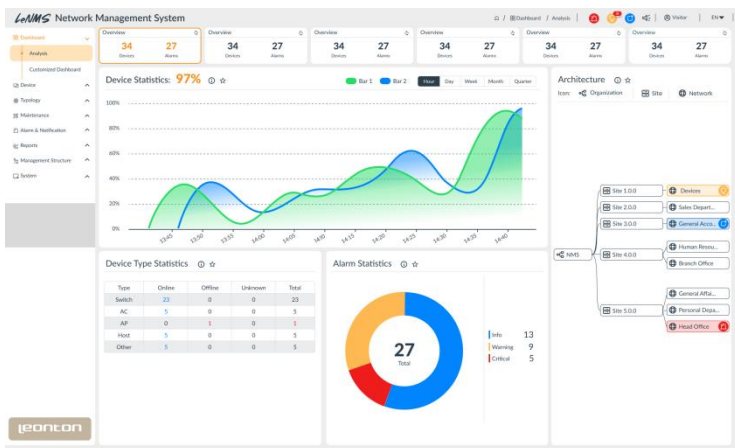


LeNMS 2.0

Network Management Suite



- Dashboard
- Real-Time Monitoring
- Network Topology
- Inventory Management
- User Management
- Configuration Management
- Firmware Management
- Alarm & Event Management and Notification
- Debugging Tools
- RESTful API
- Backup and Restore

Introduction

Leonton's LeNMS is a SNMP-based NMS (Network Management Suite) which follows ISO FCAPS network management framework. FCAPS is the acronym of five key aspects of network operations: fault, configuration, accounting, performance and security managements.

Fault management: Detects, isolates, and resolves network issues or failures to ensure continuous operation.

Configuration management: Manages network device settings and configurations to ensure consistency and proper functionality.

Accounting management: Tracks and records network usage, and configures users and groups based on granted permissions, ensuring that only authorized users can make changes to critical network systems.

Performance management: Monitors and analyzes network performance metrics such as latency, throughput, and availability to optimize operations or identify patterns and trends for making predictions.

Security management: Ensures network integrity by monitoring and addressing potential security threats, while allowing administrators to control what each authorized user can and cannot do within the system.

LeNMS is compatible with both Windows and Linux* operating systems and offers a user-friendly dashboard for monitoring network operations, inventory management, and immediate handling of alarms or events to prevent service disruptions.

LeNMS is also a centralized platform that can manage, configure, and monitor tens of thousands of network devices efficiently. It offers the capability to control devices both individually and in bulk, either through pre-scheduled operations or on-demand. The system supports comprehensive monitoring, ensuring real-time visibility into the health, performance, and configuration of all connected devices. By utilizing automated processes and task scheduling, LeNMS can streamline network maintenance, detect issues proactively, and apply configuration changes seamlessly, minimizing manual intervention and operational downtime.

Recommended System Requirements

Scale Size	Larger Scale	Smaller Scale
Maximum Managed Nodes	> 1000 nodes	≤ 1000 nodes
Recommended CPU	12 th Gen. Intel Core i7 processors	12 th Gen. Intel Core i5 processors
Recommended RAM	32G DDR3	16G DDR3
Recommended Storage	4TB	2TB
Monitor Resolution	> 1080P	> 1080P
Operating System	Windows 11, Windows Server 2019, Windows Server 2022	Windows 11, Windows Server 2019, Windows Server 2022
Browsers	Chrome, Edge	Chrome, Edge

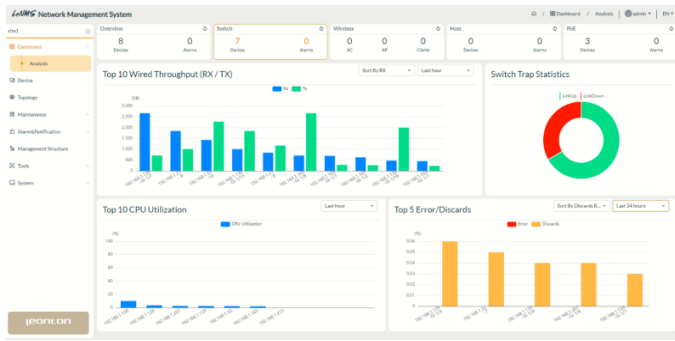
Specification

Generic	
Architecture	- Local and cloud based architecture - Client-server architecture
Theme Configuration	- The corporation's logo and name is changeable - Enables users to select from a range of predefined color schemes*
RESTful API	Provides a standard way for applications to interact with LeNMS
Wizard*	Step-by-step guidance for users to configure the LeNMS
Multiple Languages	The Web GUI supports multiple languages to enhance accessibility and user experience
Fault Management	
Topology Map	- Displays the connection status of discovered devices and reflects the associated alarm levels - To immediately discover or schedule the discovery of nodes by single IP, IP range, or subnet. - Allowing user to import meaningful background map, such as location layout map - An intuitive graphical report displays statistical information on connections, port utilization, and more. - Provides panel link status and detailed device information, such as model name, serial number, MAC address etc. - Leverages open-source map providing a geographical view*
Alarm and Notification	- Displays the received trap and syslog information sent from managed devices. - Triggers alarm notifications to predefined users when issues match the notification rules.* - Supports the ability to configure user-defined thresholds and criteria to trigger alarms, and execute associated script files when necessary.*
Database High Availability (HA)*	- HA architecture to maximize reliability, minimize data loss, and guarantee continuous service. - Load balancing to optimize the performance, enhance the availability and ensure reliability.
Configuration Management	
Configuration File	- Deploys the configure files to a single or a group of devices. - To perform immediate or scheduled backups and restores of configuration files for managed nodes. - Compare configuration files to identify differences, ensuring the integrity of the configuration. - Configures functions or parameters to a single or multiple devices immediately or by schedule.* - Enables users to customize script files for device configuration or alarm response.*
Firmware Upgrade	- Implements the firmware upgrade to a single or a group of devices. - To perform immediate or scheduled firmware upgrade procedure for managed nodes.
File Management	Manages the uploaded firmware images and configuration files
Database Backup and Restore	LeNMS offers the ability to create immediate or scheduled backups and restores of its database, ensuring data protection and recovery.

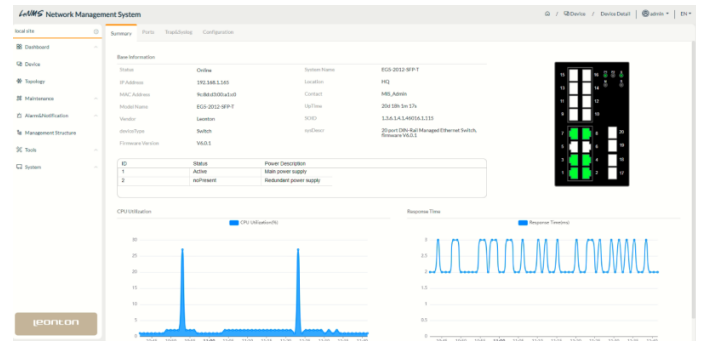
Management Tools	Provides tools to simplify the device management and troubleshooting.
Script File*	- Allows user to leverage the script file to configure the managed switches. - Integrates script execution with monitoring and alarm notifications.
ZTP (Zero Touch Provision)*	- Identifies devices without assigned IP addresses or SNMP protocols. - Provides automated provisioning of IP addresses, configuration files, and firmware updates.
Management Servers	- DHCP server to assign IP addresses to client devices. - TFTP, FTP, SFTP, SCP* servers to transfer configuration files and firmware images.
Accounting Management	
Reporting*	- Includes several statistics reports providing valuable information about device inventory, network performance, health and security. - The reports includes inventory, device detailed information, traffic statistics, trap, events, and syslog reports etc.
Performance Management	
Dashboard	- A centralized and intuitive view to overview the network performance, health, events, and trend analysis. - Allows user to customize the widgets they would like to display on the dash board.*
Monitoring	- Provides real-time device monitoring and easy location identification on topology maps, streamlining troubleshooting. - The device detailed view provides a comprehensive overview of a specific network device, including its status, configuration, performance, alerts, and traffic flow statistics information. - Grouping enhances network organization and management, facilitating efficient configuration deployment, firmware migration, and troubleshooting.
sFlow Collector & Analyzer*	- LeNMS acts as a sFlow collector & analyzer to receive and process sFlow data from managed devices. - Uses sFlow to continuously monitor traffic flows, which provides network-wide visibility into the use of the network. - The benefits include troubleshooting network problems, controlling congestion, and conducting security and auditing trail analysis.
Security Management	
User Management	- Provides role-based access control that allows for granular control over user privileges based on their roles and responsibilities. - Leverage local or external authenticators, such as Active Directory, RADIUS, LDAP, TACACS+ server to enhances the security.*

Ordering Information

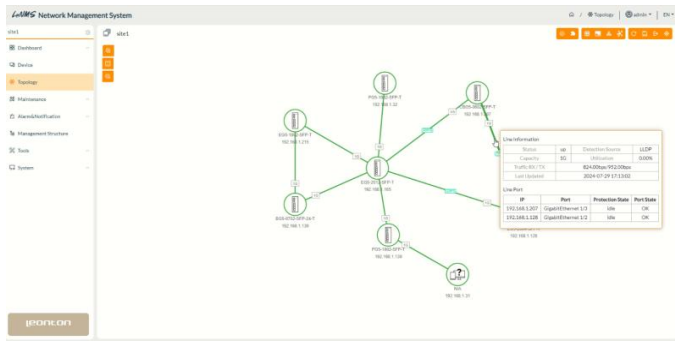
Model	Description
LeNMS-25	Allows LeNMS to manage and monitor 25 managed devices.
LeNMS-1000	Allows LeNMS to manage and monitor 1000 managed devices



Dashboard



Device Detail



Topology Map

The Trap Message view displays a table of trap messages received from network devices. The table includes columns for Time, System Name, IP Address, Location, and Message. The messages are sorted by time, with the most recent at the top.

Time	System Name	IP Address	Location	Message
2024-07-29 13:54:54	ECG-0002-WP-F	192.168.1.120	N/A	LINK-UPDOWN: Interface GigabitEthernet 1/2, changed state to up.
2024-07-29 13:54:54	ECG-0004-WP-F	192.168.1.120	N/A	LINK-UPDOWN: Interface GigabitEthernet 1/2, changed state to down.
2024-07-29 13:54:54	ECG-0002-WP-F	192.168.1.120	N/A	LINK-UPDOWN: Interface GigabitEthernet 1/2, changed state to up.
2024-07-29 13:54:54	ECG-0004-WP-F	192.168.1.120	N/A	LINK-UPDOWN: Interface GigabitEthernet 1/2, changed state to down.
2024-07-29 13:54:54	ECG-0002-WP-F	192.168.1.120	N/A	LINK-UPDOWN: Interface GigabitEthernet 1/2, changed state to up.
2024-07-29 13:54:54	ECG-0004-WP-F	192.168.1.120	N/A	LINK-UPDOWN: Interface GigabitEthernet 1/2, changed state to down.

Trap Message

The Syslog View displays a table of syslog messages received from network devices. The table includes columns for Time, System Name, IP Address, Location, and Message. The messages are sorted by time, with the most recent at the top.

Time	System Name	IP Address	Location	Message
2024-07-29 13:54:54	ECG-0002-WP-F	192.168.1.120	N/A	LINK-UPDOWN: Interface GigabitEthernet 1/2, changed state to up.
2024-07-29 13:54:54	ECG-0004-WP-F	192.168.1.120	N/A	LINK-UPDOWN: Interface GigabitEthernet 1/2, changed state to down.
2024-07-29 13:54:54	ECG-0002-WP-F	192.168.1.120	N/A	LINK-UPDOWN: Interface GigabitEthernet 1/2, changed state to up.
2024-07-29 13:54:54	ECG-0004-WP-F	192.168.1.120	N/A	LINK-UPDOWN: Interface GigabitEthernet 1/2, changed state to down.
2024-07-29 13:54:54	ECG-0002-WP-F	192.168.1.120	N/A	LINK-UPDOWN: Interface GigabitEthernet 1/2, changed state to up.
2024-07-29 13:54:54	ECG-0004-WP-F	192.168.1.120	N/A	LINK-UPDOWN: Interface GigabitEthernet 1/2, changed state to down.

Syslog View

The Backup & Restore view provides settings for backup and restore operations. It includes a top navigation bar with tabs for Auto Backup Settings, Backup Settings, and Restore Settings. The main content area features:

- Auto Backup Settings:** A section for configuring automatic backup settings.
- Backup Settings:** A section for configuring backup settings.
- Restore Settings:** A section for configuring restore settings.

Backup & Restore

Note: descriptions or features with * mark will be supported by future release.