Elements

Proactive operations, administration and maintenance system for intelligent networks

KEY BENEFITS

- Single viewpoint for operation and maintenance, delivering a centralized, graphical interface for key functions, including alarms, licenses, configuration, and deployment
- Unified configuration management tool for Sandvine products
- Real-time health check and performance monitoring
- Automated traffic classification updates for latest signature distribution
- Centralized single user management for authentication and authorization with Role-Based Access Control
- Enhanced application/data security with Secure Software Download
- High availability with Active/Standby redundancy

Elements, an integral component of the Application and Network Intelligence (ANI) Portal, is Sandvine's unified tool for operations, administration and maintenance (OAM) of all Sandvine ANI portfolio products and has been specially designed for next-generation intelligent networks. It monitors any Sandvine deployment, physical or virtual, to ensure the high availability of the infrastructure, and enables real-time updates of system policies to maintain a high quality of experience (QoE) for users.

Elements empowers network operators to proactively respond to new opportunities or trends by creating and deploying network-wide service policies from a centralized graphical user interface (GUI), drastically simplifying all aspects of Sandvine operations management with granular, role-based control.

Sandvine's Elements architecture is based on lightweight microservices to deliver high-performance real-time management capabilities. By delivering real-time information, it positions operators to have precise control over their network nodes and starts them on the path to full orchestration and automation using industry standard interfaces.

KEY CAPABILITIES

Elements supports a full range of operation and maintenance capabilities for Sandvine products, including the service and platform capabilities mentioned in **figure 1**.

Figure 1

Elements Key Capabilities

Services

Configuration and Deployment	Inventory Management	System Health Management	License Management
Alarms and SNMP Traps	Audit Management	Log Management	User Management
Traffic Classification Updates	Backup and Restore	Software Management	Bulk Operational Management

Platform

Appliance Bare Metal	Virtual	High Availability
5G	Cloud	Security

Key Service Capabilities:

- **Configuration and Deployment:** Dynamic configuration support for Sandvine products, including bulk configuration changes across multiple nodes in one click. GUI for configuring Sandvine products via NETCONF/YANG protocols, with full support for hierarchical configuration groups for configuration inheritance and pre-staging
- **Inventory Management:** Real-time inventory reporting, with multiple systems characteristics like system type, version, IP address, etc., for logistics and sparing control and monitoring
- **System Health Management:** Real-time and historical performance and KPI metrics for system health metrics of deployed products and network nodes
- **License Management:** Dynamic management for capacity and use case licensing, with a full entitlements inventory across all systems
- **Alarms and SNMP Traps:** Elements enables alarms via SNMP traps to display real-time network node fault information
- **Audit Management:** Capable of auditing the system for configuration inconsistencies between the configuration database and the node
- **Log Management:** Elements offers a centralized GUI to visualize all Sandivne's network elements logged information. Logs can be exported via SupportBundle and viewed locally in Sandvine network.
- **User Management:** Elements supports centralized single user management, authentication, and authorization. It offers Role-Based Access Control and supports single sign-on authentication for ANI portal and third-party authentication via TACACS+ and RADIUS
- **Traffic Classification Updates:** Elements offers both online and offline modes for signature updates. In the online mode, signature updates get automatically downloaded whereas in the offline mode this process is done manually. Downloaded signatures can be updated by user via a push mechanism
- **Backup and Restore:** System backup and restore is supported in both CLI and XML formats and can be downloaded as a TAR file
- **Software Management:** Improve software and firmware selective upgrade capabilities and add validation safeguards pre/post installation

Key Platform Capabilities:

- **Cloud Native:** Enables flexible deployment models and cloud readiness with Virtual Network Function (VNF) and Cloud-Native Network Function (CNF) solutions to support operator's cloud transformation plans and procurement preferences
- **Security:** Provides additional security with safe encryption algorithms and features like role-based access control
- **High Availability:** Offers high availability with Active/Standby redundancy

Figure 2

Elements User Interface main views:

- System Health
- Topology
- Operations
- Configuration
- License

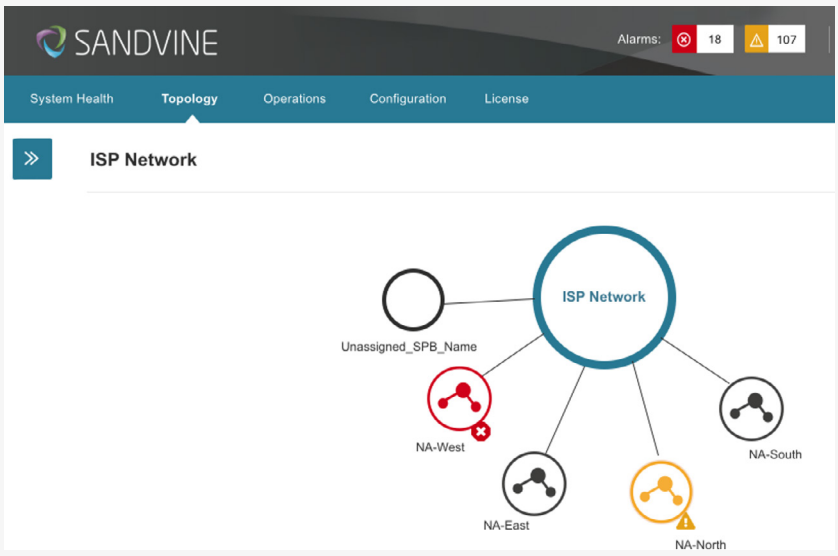


Figure 3

Configuration and deployment services

- NETCONF/YANG support
- Full view of network element configuration and YANG model
- Configuration changes push via NETCONF or bundles
- Audit mechanism and misconfiguration detection
- Hierarchical groups for configuration templating

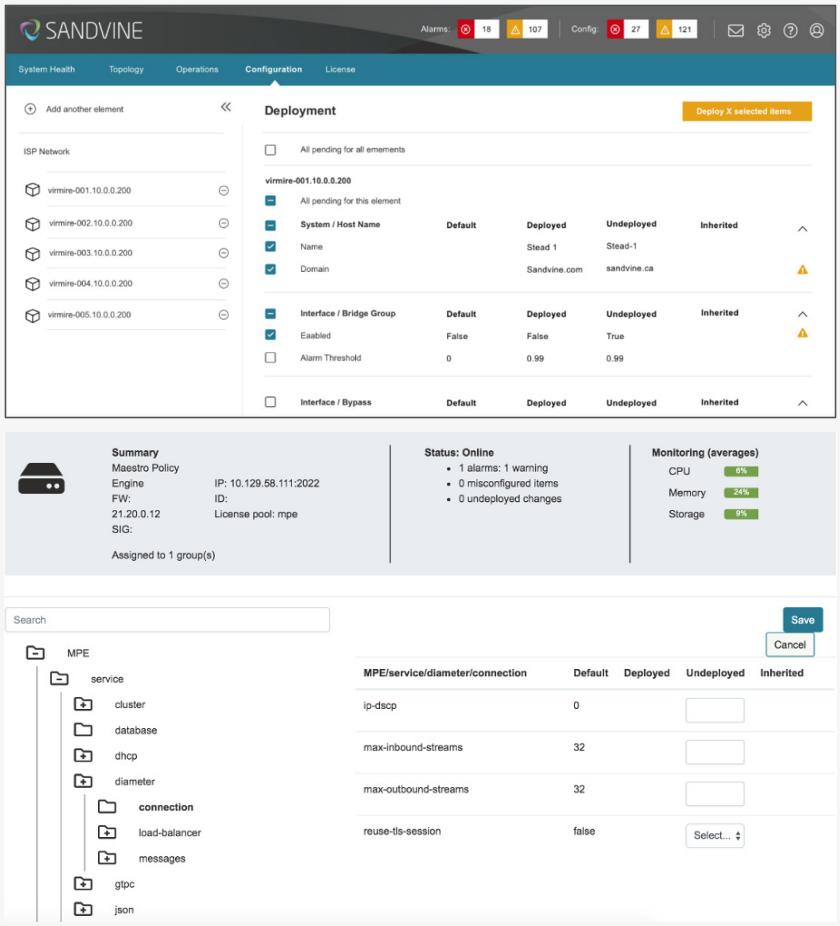
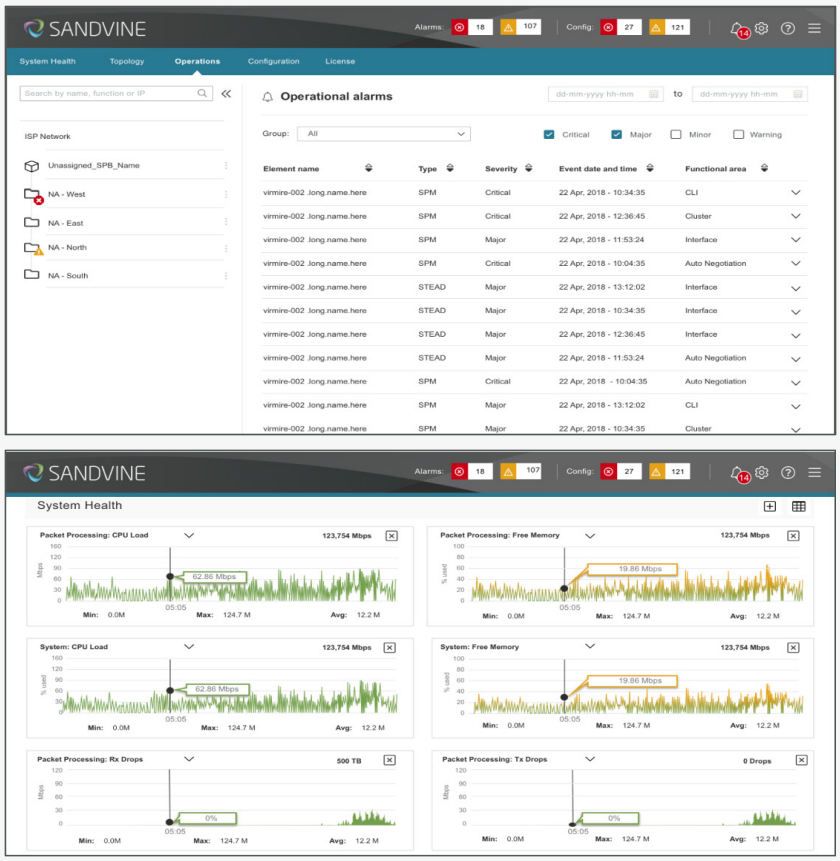


Figure 4

Alarms, Logs, and System Health

- Access to operational CLIs via web client
- Access to logs via web client
- Alarms and alarms history view
- Performance view
  - CPU utilization
  - RAM utilization
  - Disk utilization
- Network element inventory



ABOUT SANDVINE

Sandvine's cloud-based Application and Network Intelligence portfolio helps customers deliver high quality, optimized experiences to consumers and enterprises. Customers use our solutions to analyze, optimize, and monetize application experiences using contextual machine learning-based insights and real-time actions. Market-leading classification of more than 95% of traffic across mobile and fixed networks by user, application, device, and location creates uniquely rich, real-time data that significantly enhances interactions between users and applications and drives revenues. For more information visit **http://www.sandvine.com** or follow Sandvine on Twitter **@Sandvine**.

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