Introduction
As the workhorses of global communications, optical networks are vulnerable to service-disrupting problems that amplify according to the number of customers affected and the time taken to correct the situation. In the event of a fiber cut alarm, for instance, it can take hours just to identify the cause and effects, send notifications, and establish trouble tickets for each customer. “Swivel-chair” operation, with procedures spanning multiple element management systems (EMSs), inventory systems, and customer databases, further slows progress even before work is done to resolve any outage.

Less dramatic but more challenging are problems arising from gradual degradation of performance parameters. Any performance assurance system that only looks at alarms, or that doesn’t establish baseline performance parameters, will miss these looming issues.

Proactive Assurance Minimizes Service Disruption
Network problems may be inevitable, but their consequences are within operator control. Networks that use a reactive “watch-and-wait” approach to performance assurance are not adequately equipped to handle the demands of today’s customers. A proactive monitoring model, however, increases the effectiveness of performance assurance by providing information that aids in correcting problems before they become service-affecting.

The Fujitsu Approach to Automated Assurance Solutions
An automated assurance solution is a custom-built implementation developed for a specific customer’s network. These solutions offer a proactive approach and provide a holistic multivendor, multidomain view of the entire network topology, while automating the problem-resolution lifecycle through AI and machine learning. Through continuous monitoring of both alarms and performance metrics across networks and services, an automated assurance solution assists operations staff in understanding normal network trends and detecting problems early.

Fujitsu’s Automated Assurance solution platform makes it easy to view the health of the entire network through a single pane of glass, no matter how complex the topology and interconnections to its various support systems. Warnings are provided when performance metrics indicate impending downtime, and automated action can be triggered to optimize service performance and prevent issues. With its advanced user interface, technicians view service health and customer impact data, as well as valuable real time reports presented in a simple, easy-to-navigate dashboard format.

Meaningful real-time performance reports, delivered through configurable dashboards
Proactive Vigilance Minimizes Risk and Disruption

**vSure Service Assurance**
At the heart of every Fujitsu Automated Assurance solution is vSure®, a comprehensive, modular service assurance system for fault management, performance monitoring, SLA management, service analytics, and Ethernet service assurance.

![Graphical Topology View](image)

vSure service assurance uses an easy-to-read graphical topology view

vSure provides out-of-the-box device support for current technologies and protocols, including SNMP, NETCONF, and TL1. Full-cycle assurance continuously collects fault and performance data from the network and analyzes it against preconfigured thresholds. In addition, vSure’s AI Machine Learning Anomaly Detection capability learns what’s normal for your network and notifies personnel when it detects performance trending away from normal behavior. vSure can then create trouble tickets, send notifications, and invoke automated corrective action.

Unprecedented collection, analysis and presentation of detailed performance information improves network reliability, performance, and customer experience. vSure provides a dynamic, accurate, network-wide view of which customers’ services map to which resources. On-demand, real-time analytics provide a quick look into the network through easily created templates, custom dashboards, and performance trend charts.

**Solution Benefits**

**Carrier Ethernet Support**
vSure supports MEF-compliant Ethernet traffic with a rich ITU-T Y.1731-compliant capability for modeling and managing carrier Ethernet virtual circuits (EVCs) carried over optical and packet traffic. vSure monitors Ethernet service health in real-time, and accurate, automated baselines help ensure operators are notified before customers experience service disruption.

**Inventory and Workflow Automation**
vSure saves time by automating tasks that network operators previously performed manually. The solution consolidates information into its “nodes and services” view. From there, workflow automation can create trouble tickets, emails, and SMS notifications, as well as automate optimization or remediation of service issues. This improves the overall Mean Time to Repair (MTTR) dramatically.

**Automated Alarm Correlation**
One of the biggest challenges facing today’s service providers is how to interpret massive amounts of network data to identify the root cause of issues and outages. vSure provides sophisticated alarm correlation functionality, cutting through the information overload and presenting information that’s easy to navigate and interpret.

![Alarm and Event Table](image)

*Nested correlated alarms present a clean, clear view*
Flexible Alarm Filtering Speeds Diagnosis

vSure’s automated correlation performs out-of-the-box root cause analysis by maintaining a real-time topology view across network layers, and leveraging this to automatically correlate related alarms and suppress symptomatic alarms. This quickly identifies the root cause and dramatically reduces alarm noise.

In addition, flexible, easy-to-create filters provide custom alarm views, guaranteeing that important alarms won’t be missed. This capability, in combination with configurable automated workflows, root cause analysis, and service impact analysis, enables operations staff to move quickly to troubleshoot and resolve outages.

Performance Anomaly Detection
Using AI and Machine Learning technology, vSure’s sophisticated anomaly detection monitors millions of data points collected across the network and analyzes this data over time, pinpointing even tiny signs of problems and alerting staff whenever intervention is needed.

 Trouble Ticketing
vSure automates trouble ticket creation performed in various third-party ticket systems. The ticket editor allows parameters to be configured appropriately for specific ticketing systems. Ticket numbers and status are automatically synchronized with vSure, which ultimately cuts MTTR and alarm clutter.

Easily launch trouble tickets manually or automatically
Understand and Optimize Your Network’s Performance

TL1 Performance Metrics
In addition to SNMP, NETCONF and other protocols, vSure monitors all TL1 performance metrics and alarms. vSure works with these TL1 metrics and alarms to initiate automated notifications and trouble tickets based on predefined thresholds for anomaly detection. This proactive response improves network performance and alleviates network outages before customers feel the impact.

A-Z Circuit Troubleshooting
vSure includes end-to-end, hierarchical visualization of all services across all network layers and service components with a consolidated view of alarms and performance. From a single pane of glass, users see all service alarms and where they are in the service path across all devices. vSure identifies the root cause and correlates alarms, resulting in faster problem diagnosis, troubleshooting and resolution.

Conclusion
With today’s fast-evolving networks and services, manual monitoring is no longer sustainable. Legacy tools cannot proactively pinpoint and resolve outages and performance issues. Network operators need a solution that improves efficiency, empowers their operations staff, increases customer satisfaction and retention, and reduces operational costs. Fujitsu Automated Assurance solution is a comprehensive and modular solution that applies AI, machine learning, and automation to proactively address all these challenges for multivendor, multitechnology networks, including Ethernet, MPLS, packet, WDM and OTN.