



Monitor Your 5G Network with Multi-layer Assurance - from Infrastructure to Services

Run Accedian Skylight with VMware Telco Cloud Service Assurance

Telco Cloud Service Assurance at a glance

VMware Telco Cloud Service Assurance™ monitors, analyzes, and pro-actively manages multi-vendor physical and virtual environments in a single platform.

Key Capabilities and Benefits

- Simplify NOC and SOC operations with a centralized, cross-domain view.
- Gain rapid insights with integrated fault and performance management, service management, root-cause analysis, and impact assessment.
- Reduce costs and complexity through automation and optimization for assurance across layers and domains.
- Use closed-loop automation and rapid remediation to reduce OpEx and optimize resources and workloads to meet surges in demand.
- Increase operational efficiency by using artificial intelligence and machine learning (AI/ML) for rapid problem isolation, automatic suppression of extraneous alarms, and automated rule updates.

VMware Telco Cloud Service Assurance enables telco communication service providers (CSPs) to manage and operate their 5G network and services from a single pane of glass. It provides:

- Cross-domain visibility of the entire 5G RAN service stack, from the underlay infrastructure to the service, and supporting integration with NFV and RAN orchestrators for RAN auto discovery.
- Comprehensive health and performance monitoring from the RAN to the Core network, including network slice mapping.
- Just-in-time Root Cause Analysis (RCA) that can identify the cause of service loss or degradation across multiple domains and a multi-vendor stack.
- Mission-critical impact analysis to enable you to prioritize remediation and resolution based on, for example, the number of impacted customers or SLA requirements.
- Closed-loop remediation and automation with prescriptive RCA and monitoring insights provided to management and orchestration tools.

The cloud-native Accedian Skylight running on the VMware Telco Cloud Platform enables communication service providers (CSPs) to deliver enhanced, service-level performance visibility, intelligence, and an assured Quality of Experience (QoE) to the modernized radio access network (RAN).

This creates an opportunity for CSPs to build out a reliable and high-performing RAN and edge infrastructure to support new, high-bandwidth services with new workloads. CSPs can also provide real-time visibility and monitoring capabilities to support the corresponding assured QoE for a variety of demanding applications.

The Challenge

Next generation services that are mission-critical rely on more reliable platforms to deliver immediate responses, and in some cases immersive experiences. Reliability and accountability in delivering the expected QoE are essential for the success of service providers launching these new services. CSPs need to be able to provide assurance and validation of performance for meeting their service-level agreements (SLAs).

Accedian Skylight

Accedian Skylight™ is a cloud-native performance assurance platform, delivering end-to-end network, application, and service performance visibility—right from the user edge to the core network and into the cloud. Skylight uses a composable architecture consisting of Skylight sensors (lightweight sensors and container agents for active-synthetic monitoring and testing), and Skylight Performance Analytics, a fully cloud-native solution with open APIs. Skylight Performance Analytics combines data from all Skylight sensors and third-party sources into a single pane of glass.

- Multi-vendor network and service performance visibility from core to edge, public to private cloud, physical to virtual, Layer 2 to Layer 7
- Miniaturized hardware-based sensors delivering microsecond latency measurements and sub-1% packet loss for critical 5G and premium business services
- Real-time performance data for closed-loop automated assurance and orchestration
- Analytics powered by machine learning to analyze and correlate performance data with metadata to automate detection, speed up troubleshooting and help to predict and automated fixes
- Continuous and real-time service performance monitoring and real-time granular KPIs for end-customer reporting and SLA monitoring.

Performance monitoring and management systems also become more complex. CSPs need to monitor network performance for point-by-point components and for end-to-end system and service levels. Management must become more service-centric and customer-centric beyond the data center and network operations center.

Traditional manual fault identification and remediation processes are incapable of rapidly handling this complexity or the large volumes of 5G network data, events, and alarms. Since traditional processes do not associate identified problems with impacted services and customers, real-time SLA commitments that require high reliability and availability are jeopardized.

Meeting SLA and service quality expectations in real time requires automated remediation across the infrastructure, orchestration, and service layers.

In the 5G world, 5G standalone networks can be sliced into multiple virtual networks, each tailored to meet specific needs of services or applications. Each slice operates in isolation with its own dedicated set of resources which are optimized for better resource utilization. The network slices hence need to be monitored individually for fault and performance that enables operators to deliver a more diverse set of services with enhanced quality, customization, and efficiency.

The Solution – Analytics and Monitoring

To make the collected key performance indicators (KPIs) truly useful, a context for the data must be established. KPIs are measured by Accedian Skylight sensor agents and streamed to Skylight Analytics in near real-time. Upon ingestion, Skylight Performance Analytics cleans and enriches the KPIs with machine- or user-specific insights (metadata tags) in real-time enabling enhanced correlation capabilities.

After the collection and enrichment process, the data is analyzed in a dynamic and real-time fashion to produce machine learning-powered insights, intelligent reporting and alerts, and the creation of real-time dashboards for enhanced drilldowns and rapid troubleshooting. The intelligent monitoring insights derived from the Accedian Skylight platform can be combined with defined workflows in an automation platform. The solution is designed to fit seamlessly into existing operations for ease of management, rapid implementation, and operational cost savings.

Performance data and KPIs can also be shared through standards-based APIs or message buses (such as Kafka) with third-party data management, reporting, and analytics platforms, such as VMware vRealize Operations or VMware Telco Cloud Service Assurance. This data can be easily collected, integrated, analyzed, and consumed. For these integrated solutions, Telco Cloud Service Assurance will initiate the automated problem remediation.

VMware Telco Cloud Service Assurance features a data collector framework for customers such as Accedian to develop their custom data collectors to on-board 3rd party data sources using data collector software development kit (SDK). The SDK introduces a programmable framework focused on on-boarding data for fault, performance monitoring and assurance use cases based on various protocols such as REST, Kafka, SNMP, and so on.

Benefits of Skylight running on VMware Telco Cloud

- Deploy new assured 5G services and slices faster
- Reduce risk of new services failure and negative brand impact with deeper visibility
- Assure service quality with granular monitoring of KPIs
- Protect revenue by confidently meeting strict SLAs with business customers
- Detect service degradations before customers are impacted
- Optimize capacity, deployment planning, and mobile backhaul

VMware Telco Cloud Service Assurance

VMware Telco Cloud Operations is a multi-layer service assurance to holistically manage multi-vendor virtual and physical networks with root cause analysis, performance management, fault management and business impact management all in one.

- Single pane of glass network management that correlates service health to virtual and physical network infrastructure
- Performance analytics based on machine learning reveal actionable insights, detect performance anomalies, and trigger alerts
- Multi-tenant monitoring of multi-vendor cloud, LAN and WAN solutions in a unified view
- Automated root-cause analysis of issues across multiple network layers
- Prioritization of issues based on business priorities and impact
- Closed-loop actions and remediation of problems via integration with orchestration and OSS tools
- Multi-vendor SD-WAN monitoring

Figure 1 demonstrates how the Accedian Skylight solution can be implemented to provide end-to-end service assurance and continuous network performance monitoring applied at the DU and CU locations. It can also support on-demand testing and monitoring, with microsecond measurement precision, applied as required based on the problems observed to gain greater insight into the problem link or equipment. For User Equipment (UE) testing, it can monitor permanently stationed emulators and/or field technicians that carry test UE. These tests can be provisioned on-demand while a technician is on site or remote.

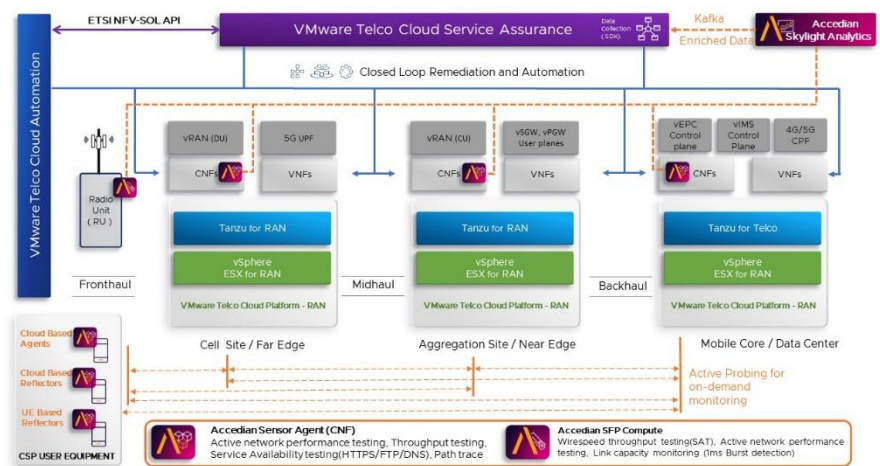



Figure 1: Analytics and Monitoring Architecture with Accedian Skylight Performance Analytics and Sensors for Multi-Layer Assurance

The data can be shared with VMware Telco Cloud Service Assurance for reporting on an operations console display, with automated and operator-initiated actions to remediate detected anomalies. Data can also be shared with VMware Telco Cloud Service Assurance for analysis using its in-built anomaly detection for root cause analysis.

Highlighted Use Cases

Closed Loop remediation and Automation

VMware Telco Cloud Service Assurance, in conjunction with Accedian Skylight, drive closed-loop remediation through integration with resource, service, and lifecycle management orchestrators that are based on SOL API standards, such as VMware Telco Cloud Automation. The platform's root cause and service impact analysis capabilities resolve problems quickly by automatically correlating symptoms from the layers of the infrastructure stack (physical, virtual, Kubernetes, CNFs, VNFs, and services) and pinpointing the problem's root cause. After identifying the root cause, VMware Telco Cloud Service Assurance provides a rich set of manual and automated remediation capabilities, from an SSH connection to the device and opening tickets in third-party systems to full remediation workflows, including integration with various third-party systems and orchestrators. Using its ML/AI capability,



VMware Telco Cloud Service Assurance acts as a proactive protector in detecting issues before they occur and remediating them with the right action at the right time.

Network Slice Assurance

VMware Telco Cloud Service Assurance jointly engineered with Accedian Skylight integrates with VMware Telco Cloud Automation to monitor and assure network slices. CSP benefits include:

- Network slice mapping to service/virtual/physical infrastructure discovery
- Insights/correlation of performance across network domains and network layers
- Complete visibility into the end-to-end infrastructure that comprises a network slice; network slice domains, inter edge-compute, cloud, service connectivity between MEC
- Monitor performance and health of each virtual network slice, slice subnet, and end-to-end slice
- Root cause analysis (RCA) to isolate slice quality of service (QoS) degradations across multi-domain service stack
- Prioritize RCA issues based on most impacted slices due to SLA violations to trigger closed-loop remediation

Summary

With the combination of the VMware Telco Cloud Platform and Accedian Skylight, CSPs can maximize their 5G infrastructure investments with faster and easier service deployment. CSPs will have the confidence to provide an assured class of service to their customers and maximize monetization for advanced 5G services that run on modernized, disaggregated RAN architecture.

Running on the VMware Telco Cloud Platform, Accedian Skylight component installation is easily orchestrated, tests are easily provisioned, intelligent in-context analysis is easily accomplished, and dashboards are insightful and easily consumed.

For more information on VMware Telco Cloud Platform, please visit telco.vmware.com or contact your VMware representative.