



Federos Software Assure1™ Unified Service Assurance for NFV

Enabling automation through intelligence

Mobile network operators (MNOs) have a lot to think about in delivering differentiated services across environments that span 2G, 3G, 4G, and VoLTE infrastructure, including RAN, Backhaul and Core networks. They have to stay on top of spectrum issues to fully exploit new frequency bands and transmission points, as well as continue to make advances in small cells, network densification and network slicing and virtualization.

Their efforts have made mobile a robust broadband experience, setting the stage for the next step — an evolution from 4G to 5G, with radio spectrum and micro-cells filling the gaps.

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These complex, cross-domain scenarios will make it more important for MNOs to proactively detect and troubleshoot network service outages and degradations that could ultimately affect their most-valued subscribers.

And, as environments become more virtualized, it will be important that traditional trouble shooting and root cause analysis give way to more sophisticated unified assurance, which leverages analytics, AI and big data to automatically correlate data with network-performance and customer-experience data, better supporting stringent SLAs, and helping networks to dynamically expand and contract based on insight derived in real-time.

Assure1 Unified Service Assurance for Service- and Network-aware Automation

Troubleshooting and service assurance are among the top challenges stifling NFV deployments. MNOs striving to support SLAs for real-time, always-on service delivery in virtual environments must automate if they are to achieve true intelligence in how they capture, normalize and analyze data from an increasingly complex universe of resources. They must have service- and

network-aware management capabilities in order to recognize whether functions are performing as needed in virtual and hybrid environments.

Assure1 unified service assurance is designed to be the “brain” that will drive that automation and intelligence, thus opening the door to self-healing, and self-optimization of networks. With rich data collection plug-ins, advanced visualization and open APIs, it will be possible for data to flow seamlessly across applications, fault management, performance management and topology graphs.

This will help MNOs to both understand and facilitate automation of event-driven processes, which will ultimately feed orchestrators for what can become automatic reconfiguration and hence optimal service delivery through just-in-time resource management. This simplification means that service chain creation can go from months to days; onboarding services can go from weeks to hours; instantiating complex services can go from days to minutes.

This is a departure from silo'd “manager-of-manager” point solutions, rules-based engines and other static root cause analysis systems that manage only individual parts of the network — making them incapable of relating data across domains in hybrid environments.

Critical in these hybrid environments will be a foundation of robust topology graphs rich with insight and clarity derived from the knowledge and awareness hidden in data sets spanning myriad network domains. Assure1 topology is rich with insight because it leverages a single, unified code set, database and presentation interface, providing an end-to-end view of both physical- and virtual network function domains (PNF and VNF). Only with that unified view can there be enforceable QoS across the dynamic landscape of hybrid networks. Assure1's ability to traverse both virtual and physical environments means MNOs can collect and present data from all sources, such as tools, EMSes and databases. They can also combine fault, performance, service management, and topology components in one unified GUI.

Closed-Loop Automation

Closed-loop automation refers to the constant assessment of network traffic and performance to ensure service quality, as well as detect threats and drive innovation. For example, it means a network should automatically add layers of a firewall if a network comes under a DDoS attack, or that it should automatically make adjustments when latency issues for a service arise. Such capabilities can set the stage for constant improvement, optimization and remediation in terms of security, performance and fault management.

Closed-loop automation is invaluable, but difficult to achieve because of the dynamic and constant movement of resources as PNFs and VNFs are stitched together in service chains comprising increasingly complex interdependencies and diverse topologies.

Assure1's Discovery Engine can accelerate the evolution toward closed-loop automation, as it is designed specifically for layer-2 and layer-3 PNFs. And because it works with a variety of commercial orchestration systems, it can expedite the move toward virtual and hybrid networks — performing discovery of the “normal network” in the layer-2 and layer-3 topology, and using a “hybrid stitch” to gain awareness of how provisioning systems are chaining together VNFs and PNFs in the topology. This is accomplished through an API layer that accepts connections from a variety of network orchestrators.

Architecting for Scale

To accommodate the constant fluctuation and change, Assure1 boasts a modular and componentized product set so that MNOs and enterprises can evolve from base-level topology graphs to more robust capabilities.

At the orchestration level, Assure1's topology graph and object model have been built out to monitor service instantiation and provisioning, and to report back on which services are turned up and running. Rich data modeling enforces the common object model, into which data and objects can be abstracted and aligned for runbook automation (RBA). As that evolution takes place, Assure1 will enable next-gen discovery and polling, which can set the stage for ML in Elastic Stack and other advancements.

The importance of this RBA approach cannot be understated, as it codifies service characteristics, interdependencies and policies, eliminating the need for hard coding service behaviors into workflows — an important step in operationalizing best practices and intellectual property so that automation can become a reality for MNOs.

For a greater degree of automation, Assure1's Knowledge-driven Operational Automated Learning Agents bridge the gap between knowledge management engines and RBA tools, which empowers runbook developers to insert a knowledge base into a wiki-based runbook process. That allows knowledge to flow among all users. For example, administrators can develop, test and deploy new automation policies, which can then be leveraged by operators to reduce or eliminate mundane tasks.

And to further augment flexibility and agility, Assure1 leverages RabbitMQ, an open source message broker software that converts scalable components into microservices. This will help MNOs and enterprises scale on demand, as the individual components (products, for example) will automatically report back on how busy they are, becoming self-aware.

With each of these capabilities, Assure1 demonstrates a desire to future-proof investments for its customers, addressing not only today's vital service-assurance challenges but looking to the future and what will be critical to NFV deployments as virtualization initiatives continue to mature.



CASE STUDY: MANX

Since Manx operates a complex and diverse network, including wireline telephony services and the latest 4G wireless services, its operations team needed end-to-end service management. Additionally, the company was experiencing rapid growth in its mobile business, which required that it build and deploy new technologies whilst simultaneously managing existing services. The organization needed to process all metric data produced by the network — something that was complicated by the high number of element management systems (EMSs) and disparate views.

Manx pursued a solution that would provide dashboards and reports to better represent data and provide visibility into performance statistics across their Radio Access, Mobile Switching and Packet Switched Core Networks. The Huawei M2000 network element manager provided some of this functionality, however, Manx needed the ability to present statistics on a single platform — viewable by all levels of support and management.

THE SOLUTION

Federos Software's Assure1 and Galileo Vision

End-to-end mobile service assurance was enabled by Assure1, which was configured by Federos partner Eirteic to collect all faults and vital radio access stats, including 2G, 3G and 4G cell level, packet switch core and mobile switching metrics from the EMSs, and, directly from devices.

Assure1 gave Manx the means to unify and simplify the data into a single view. Assure1's proactive alerting enabled Manx to identify systemic issues in the mobile environment before they impacted services and users.

In order to provide Manx with an optimised performance management solution, metric data was collected from the network and condensed into Key Performance Indicators (KPIs). Eirteic created categories for these metrics using the ARIAM approach (Accessibility, Retainability, Integrity, Availability and Mobility).

Assure1 for mobile service assurance utilizes best practices to create and maintain mobile KPI formulas. The key to great service views is the availability of data, from all network resources, being presented through easy to use reports and dashboards. Assure1 dashboards gave Manx a unified high-level view of its mobile network, whilst still enabling a user to drill down to specific faults or metrics.

Galileo Vision was deployed to enable the visual correlation of infrastructure and service issues (fault, performance, usage and service status) based on location and environmental factors such as adverse weather and electrical outages. At Manx, Galileo Vision was configured to visualize the status and coverage of each eNodeB indicating current fault, performance and usage status.

THE RESULT

This solution enabled Manx to improve its mobile-user experience by highlighting the existence of and assisting in investigating the root cause of potential service outages and degradations. Fault and performance data was unified into a single mobile service assurance solution. The solution presented administrators with a simplified, real-time view of service quality indicators. This enabled proactive problem resolution and prevention, even in complex, cross-domain scenarios, e.g. from the RAN to the backhaul to the core. The adoption of a multi-technology, multi-vendor solution from Assure1 has enabled Manx to optimize TCO and reduce Opex through the consolidation of OSS tools whilst refocusing users and staff.



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ABOUT

Federos

Federos provides a next generation, service assurance solution that unifies fault, performance, topology and service level management in a single scalable platform. With the product suite from Federos, you can drive IT and OSS transformation to service-oriented operations and accelerate delivery of new services to increase revenue, while consolidating disparate and legacy tools to significantly reduce operations costs.

