

Service Assurance for SCADA Services

IT system performance is critical to energy companies and utilities. Degradations or outages can quickly ripple through the business and lead to production or transmission delays, customer service impacting problems, regulatory compliance issues, and ultimately affect revenue. Applications such as Supervisory Control and Data Acquisition (SCADA) systems are critical to running the facilities and equipment, transmission and production sites, and grid automation projects, like smart meters. Comprehensive service assurance for this application is key to the utility company's day-to-day operations.

Packet-based visibility for proactive problem detection and troubleshooting of SCADA systems is essential in today's complex infrastructures and broadly distributed energy generation and transmission facilities. Based on wire data, NETSCOUT's patented and highly scalable Adaptive Service Intelligence™ (ASI) technology provides the foundation for the robust data sources available to monitor and analyze SCADA service delivery throughout today's energy utility infrastructures.

The innovative InfiniStreamNG™ family of hardware, software, and virtual appliances expands the reach of ASI from data centers, to operations centers, to remote generation and transmission sites, where visibility is needed to assure quality performance of services. They can be deployed pervasively throughout the infrastructure, feeding rich wire-data for smart data with key performance metrics to the nGeniusONE® Service Assurance platform for smarter analytics. With this end-to-end view, including remote site visibility, IT teams can more quickly troubleshoot performance issues, particularly in these distributed utility environments. Ultimately, this reduces Mean Time to Repair (MTTR) and helps keep "the power" running efficiently.

nGeniusONE – Proactive Service Assurance

The nGeniusONE platform utilizing InfiniStreamNG and vSTREAM™ appliances provides proactive service assurance with identification of emerging SCADA service problems over the energy company infrastructure, including remote facilities

that are key to power production and transmission. SCADA is a real-time application that is immediately consumed and analyzed for critical statistics on power company efficiencies and operation, as well as alerts to system anomalies. The nGeniusONE solution analyzes SCADA application traffic in real-time as well, to deliver end-to-end visibility into the availability and performance of this process-focused application to verify optimal performance. Further, SCADA is monitored alongside other energy company applications, the network, service enablers and end-user activity to assure the effective operation of power company IT systems. By understanding the relationships between the SCADA and the rest of the environment, the nGeniusONE platform assures availability and performance of the services the business relies on every day.

Examples of issues addressed by nGeniusONE in utilities with SCADA include:

- **Server Load Issues** – nGeniusONE delivers visibility into the load to and from the SCADA application and database servers from sensors throughout

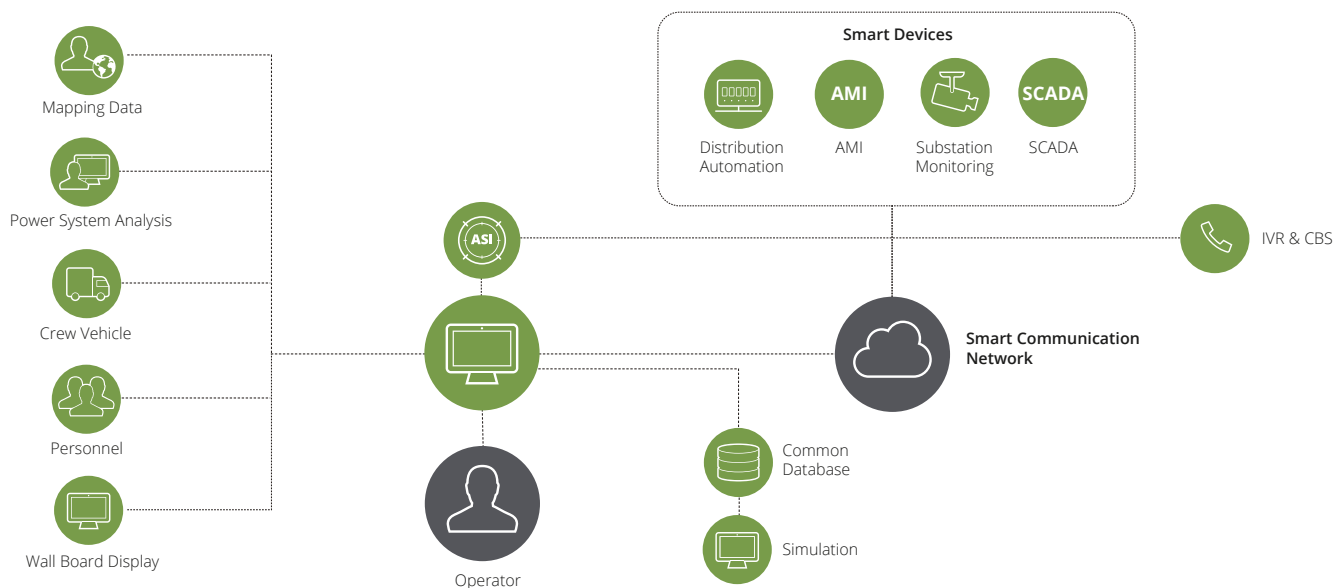


Figure 1: Overall nGeniusONE platform deployment for end-to-end business service assurance, including data centers, headquarters offices, generation and transmission locations, remote substations, and other sites. nGeniusONE monitors applications and services, and, in particular, SCADA services to help the entire organization run effectively and efficiently to maximize competitiveness and profits.

the energy company environment. Information from many sensors in the power generation system process and other areas is sent to the application and database servers at configured intervals for maintaining production quality and safety and for operations continuity.

- **Identify Cause of Session Latencies for SCADA** – nGeniusONE monitors session response times between sensors on local machines at facilities and SCADA application and database servers in data centers to determine where application slowdowns occur, allowing a reduced MTTR and keeping power generation and transmission running efficiently. Monitoring the activity of adjacent applications in the same network enables nGeniusONE to identify errors and disruptions that may affect SCADA performance.
- **Capacity Planning** – nGeniusONE reports show usage and performance of applications, conversations, and network links at remote locations, including between these locations and the data centers, allowing energy companies and utilities to track and trend utilization to right-size services and contract for the appropriate bandwidth at each location.
- **Pinpoint Impact of Poor SCADA Service** – nGeniusONE shows the service impact of degradations in SCADA, not only indicating how SCADA's performance is affected, but also the location of the users, communities, and sensors / equipment they are collecting and sending data on.
- **Track and Trend Traffic in Support of NERC Compliance** – With monitoring in key areas of the network, such as at the SCADA DMZ, we are able to support the need for "Data Historians" in cases where that is appropriate for a utility. In the event of an audit from NERC, historical forensic records of communications to or within the power generation and transmission facilities can be resourced.

Seamless, Top-Down Workflows

The nGeniusONE platform leverages the power of ASI to help power company IT teams address issues impacting SCADA services as well as other key customer-

impacting services and applications. The data is efficiently organized so it can be viewed by a range of keys, such as locations, local and cloud networks, Quality of Service (QoS), servers, applications, etc. This enables the nGeniusONE platform to offer a top-down, workflow-based approach to problem identification, service triage, and resolution.

nGeniusONE simplifies challenges for IT in delivering high-quality, consistent user experience and real-time communications for SCADA services throughout the distributed environment by providing the following key analysis layers:

- **Service Dashboard** – The dashboard delivers real-time status conditions, metrics, alarms, and intelligent early warning of application performance problems. IT teams can use the dashboard to quickly spot performance issues related to SCADA as well as other critical services, such as advanced metering, smart grid, CRM, and UC&C. It also provides insight into communications across the environment that includes traffic from the SCADA sensors on field equipment, and application server components.
- **Service Dependency Map** – The Service Dependency Map provides visibility into all the dependencies among various components that deliver a broad spectrum of utility, SCADA, and its connections to other business and administrative networks used for productivity improvements. IT teams use this information to analyze the service delivery environment, application servers, backend databases, etc., to discover the client-server relationships and messaging performance.
- **Service Monitors** – Service monitors, including the Universal Monitor, enable IT teams to quickly triage and isolate the sources contributing to performance degradations across multi-tier environments, including Web servers, Active Directory servers, application servers, backend databases, and virtualized components. Using these monitors, consolidated views are available for application request workloads, traffic latencies, and authentication and DNS errors.

- **Session Analysis** – Session Analysis views help IT teams evaluate transaction latencies, network-related information (e.g., average response time and QoS class assignments), as well as detailed session and application flow information for SCADA and other essential utility applications.
- **Packet Analysis** – Integrated nGeniusONE Packet Analysis enables IT teams to perform deep-dive, protocol-level analysis and forensic evidence collection of not only the SCADA application, but also other power company applications found in these multi-vendor environments.

A majority of performance issues can be efficiently triaged by using the dashboard and the service monitor screens alone. However, should deep-dive troubleshooting be needed, IT teams can contextually drill down to the Session and the Packet Analysis layers.

Benefits of nGeniusONE Solution

- **Optimize Ongoing Operations and Services in Power Generation & Transmission facilities** – reduce impact of SCADA-impacting issues with proactive, real-time monitoring, analysis, detection, and notification of issues.
- **Lower MTTR Generation & Transmission Impacting Issues** – with automated root cause analysis. Situation Analysis finds root causes of various performance issues and their impact.
- **Improve IT Productivity** – with visibility into SCADA and other services communicated across the broadly distributed power company operations for end-to-end, comprehensive performance and availability analysis.
- **Cost-effective, Pervasive End-to-End Monitoring** – InfiniStreamNG and vSTREAM deployments allow comprehensive and cost-effective instrumentation from data centers to remote locations.
- **Assure Business Compliance and Reputation to avoid Costly Penalties** – Provides ongoing monitoring, visibility, detection, and troubleshooting tools required for utilities to ensure against threats – both digital and financial – with evidence available for regulatory audits as necessary.



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