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Service Assurance for Manufacturing Lines with nGeniusONE, vSTREAM and vSCOUT

IT system performance is critical to manufacturers. Any degradations or outages quickly have a ripple effect through the business and lead to production delays and/or quality issues and ultimately impact revenue. Applications such as Manufacturing Execution Systems (MES) and Supervisory Control and Data Acquisition (SCADA) systems are critical to running the production lines. Comprehensive service assurance for these applications is key to success and although they take advantage of centralized data, they also rely on local communication between machines on the manufacturing line bypassing the central data center which complicates centralized monitoring. Also complicating centralized monitoring are remote manufacturing facilities common for large manufacturers. These manufacturers often localize IT services at these remote facilities to streamline the processes and contain costs. The local services often use virtualized servers that can operate the facility autonomously and only synchronize information with the central data centers with regular updates. In this case, only monitoring centrally at the central data center leads to delays or failures in detecting service degradation.

Packet-based visibility for proactive problem detection and troubleshooting is even more important in today's distributed infrastructures and at precisely the same time, it is becoming more challenging to implement. Overcoming deployment issues and costs have been major barriers to achieving the necessary visibility into modern manufacturing environments.

Based on wire data, NETSCOUT's patented and highly scalable Adaptive Service IntelligenceTM (ASI) technology provides the foundation for the robust data sources available to monitor and analyze service delivery throughout today's manufacturing infrastructures. The innovative vSCOUT and vSTREAM software applications expand the reach of ASI to productions lines and remote manufacturing facilities not feasible with a physical probe, thus overcoming the visibility challenges. They can be deployed pervasively on virtual servers in the infrastructure feeding rich wire-data with for smart data key performance metrics to the nGeniusONE platform for smarter analytics. Using vSTREAM and vSCOUT, manufacturers can more easily and cost effectively deploy

the monitoring needed on virtual servers at remote locations for visibility into MES and SCADA services operating across the local manufacturing lines that don't pass through the central data center. With this end-to-end view and / or remote plant visibility, IT teams can more quickly triage performance issues, particularly in complex, distributed manufacturing environments. Ultimately this reduces Mean Time to Repair (MTTR) and helps keep manufacturing lines running efficiently.

nGeniusONE – Proactive Service Assurance

The nGeniusONE platform utilizing vSTREAM and vSCOUT provides proactive service assurance with identification of developing problems over the manufacturing infrastructure including at remote facilities and out to the edge of the production lines. It analyzes network and application traffic to deliver end-to-end visibility into the availability and performance of the applications, network, service enablers and end-users to assure effective manufacturing IT systems. By understanding the relationships between the various applications, network, users & tools, service enablers such as DNS, DHCP and LDAP/AD, and databases, the nGeniusONE platform assures availability and performance of the services the business relies on.

Examples of issues addressed by nGeniusONE in manufacturing include:

- **Server Load Issues** – nGeniusONE delivers visibility into the load to and from MES and SCADA application and database servers where information from many sensors on the production lines is critical to maintain production quality and keeping the lines operating smoothly
- **Session Latencies** – nGeniusONE monitors session response times between clients and servers, including between manufacturing machines, to determine the specific point on the data path where application slowdowns occur allowing a reduced MTTR and keeping production line running efficiently
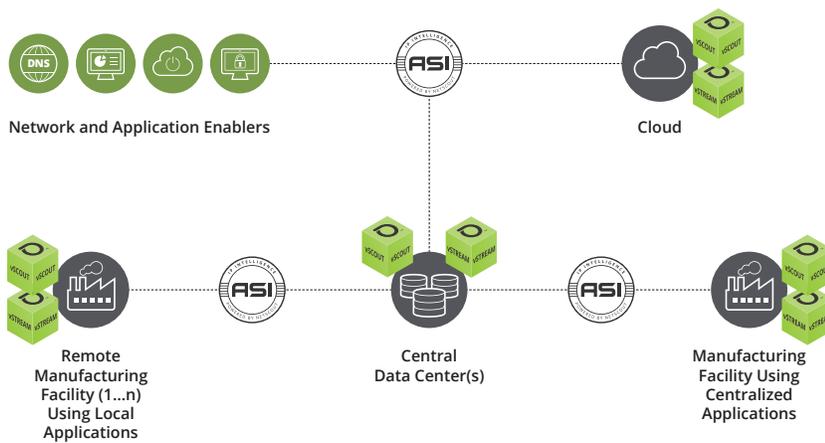

Figure 1: Overall nGeniusONE platform deployment for end-to-end business service assurance including remote locations and production lines where not all traffic traverses the central data centers. nGeniusONE monitors applications and services from production lines to business enablement keeping the entire organization running effectively and efficiently to maximize competitiveness and profits.

· **Capacity Planning** – nGeniusONE reports show usage and performance of network links at remote locations as well as between these locations and the data centers allowing the manufacturer to right-size services and bandwidth

· **Impact** – nGeniusONE shows the service impact of degradations not only indicating which services are impacted and how, but also the location of the users, communities, and production equipment that is impacted

Seamless Top-Down Workflows

The nGeniusONE platform leverages the power of ASI to help manufacturing IT teams address factory floor as well as both internal and customer facing business 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.

The nGeniusONE platform provides a consistent set of service-oriented workflows to enable seamless, contextual transitioning across multiple layers of analysis. This allows the platform to facilitate efficient and informed hand-off of incident response tasks across different groups, fostering IT team collaboration as well as more informed partnering with manufacturing leadership.

nGeniusONE simplifies challenges for IT in delivering high quality, consistent user experience and machine communications for factory floor and business services 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 composite services such as MES, SCADA, MRP, CRM, and UC&C,

including application server components, integrated web and cloud components, key middleware, backend databases, and service enablers in a single view.

· **Service Dependency Map** – The Service Dependency Map provides visibility into all the dependencies among various components that deliver a broad spectrum of factory, CAD/CAM and business IT services. This enables IT teams to analyze the service delivery environment and 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 degradation within multitier environments, including web servers, Active Directory servers, application servers, backend databases, and virtualized components. Using these monitors, IT teams get a consolidated view of application request workloads, traffic latencies, and authentication and DNS errors, providing holistic visibility into the performance of manufacturing services.

· **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 mission critical services such as MES and SCADA.

· **Packet Analysis** – Integrated nGeniusONE Packet Analysis enables IT teams to perform deep-dive protocol level analysis and forensic evidence collection of applications and services, end-to-end in the environment, such as multiple vendor MES, MRP, ERP, and other business critical services.

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 of Manufacturing Production Lines** – with proactive detection and notification of issues. Reduce business impact from issues with proactive notifications when performance or availability suffers, even at remote locations and with machine to machine communication common on the factory floor where there may be a lack of personnel available to report problems.

· **Lower MTTR Production-line Impacting Issues** – with automated root cause analysis. Situation Analysis finds root causes of various performance issues as well as the impact. Correlating seemingly disparate latency, failures and errors into situations to alert IT to problems and root cause allowing them to be addressed proactively even before the business is impacted.

· **Improve IT Productivity** – with visibility into global factory operations for end-to-end, comprehensive performance and availability analysis. IT teams can quickly research factory and business application performance issues and pinpoint the source of problems, including service enablers such as DNS, LDAP, DHCP or RADIUS, impacting the end-to-end processes.

· **Cost-effective, Pervasive End-to-End Monitoring** – vSTREAM and vSCOUT deployments allow comprehensive and cost-effective instrumentation in remote locations and on manufacturing lines where local traffic may not reach the central data center

· **Assure Business Success** – Provides the visibility, detection and troubleshooting tools required for IT to proactively support the manufacturing executives' requirements for high performance, high availability, services required on their production lines and other areas of the business

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