

nGeniusONE Platform for Healthcare

Service Assurance for Healthcare IT

The rapid evolution of healthcare technology has transformed the network environment that delivers patient information and treatment services. Electronic medical records (EMR/EHR), e-prescribing, medical imaging, and Web-based patient support services, all accessed by a plethora of electronic devices, come with an expectation of secure, continuous availability. The goal is to see and treat a patient safely, efficiently and without delay. After all, there is no down-time in this 24 x 7 x 365 world of critical healthcare services.

Complexity is a fact of life in offering uninterrupted access to healthcare applications across the enterprise network environment, be it on premise or hybrid cloud. These application services depend on the efficient functioning and interoperability of the application servers and backend databases that are part of the EMR or e-prescribing service, specific operating

components like modalities in imaging services, and access to WAN / Internet connections for communications with insurance partners. Healthcare organizations also rely on the underlying converged network infrastructure and/or the cloud for other service elements, such as unified communications (UC) gateways, session border controllers (SBCs), Citrix services, Health Level 7 (HL7) engines, routers, load balancers, firewalls, and service enablers. And they all need to interoperate seamlessly, without exception.

With so many possible areas that could contribute to application degradations, IT teams need a robust service triage solution that is capable of very quickly isolating service delivery management problems across multiple domains.

The nGeniusONE™ Service Assurance platform provides real-time visibility into the performance of healthcare services by analyzing traffic flows over the network. nGeniusONE leverages rich traffic-flow data

for extracting performance metrics, rather than relying on server agents, vendor-specific metrics, or a multitude of incomplete point tools which require a specific skillset to operate. Powered by Adaptive Service Intelligence™ (ASI) technology, the highly scalable and patented deep packet inspection engine, the nGeniusONE platform enables IT teams to identify the root cause for performance issues impacting the prompt delivery of application services occurring in the service delivery environment. With this end-to-end view, IT teams can quickly triage performance issues even in complex multivendor healthcare networks, ultimately reducing Mean- Time-to-Repair (MTTR).

Performance Issues Solved by the nGeniusONE Platform

The nGeniusONE platform delivers visibility into the performance of an integrated service delivery environment, including desktop virtualization, application servers, HL7 services, load balancers, routers, service enablers (e.g., DHCP, LDAP/AD, and DNS), backend database servers, the application

the network, WAN, and the end users. As a result of this integrated view that shows the interrelationships between different elements used in the service delivery, nGeniusONE can reveal the full context of service anomalies contributing to slow application response times and poor clinician and patient experiences, including:

- **Server Load Issues** – IT teams get visibility into the load to, and from, each application and database server that may be contributing to the workload for each server.
- **Session Latencies** – Tracking application performance over time by monitoring session response times between clients and servers helps to uncover where in the path the slowdown may be occurring.
- **Capacity Bottlenecks** – Trended usage information across the healthcare network to discover throughput issues and lack of sufficient capacity to support bandwidth intensive services like imaging.

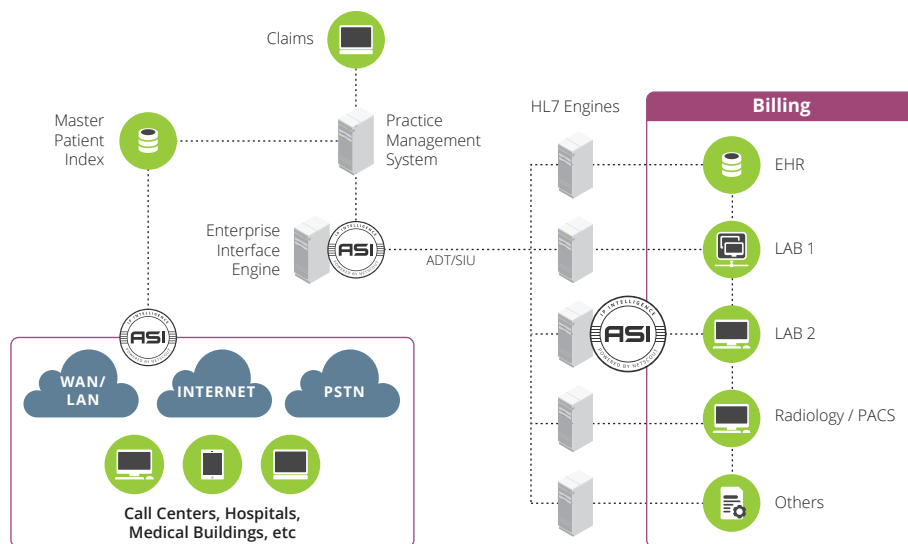


Figure 1: The nGeniusONE platform delivers continuous monitoring and analysis of application, web servers, database and service enablers throughout healthcare network environments to reduce time to resolve performance issues that impact patient care and healthcare services.

- **Connection Issues** – Triage connection issues with quick and easy-to-interpret performance indicators and error analysis to reveal common issues, like load balancer encryption misconfigurations and/or DHCP and Active Directory privileges issues.
- **Patient-care Experience Impact** – IT teams need visibility into which community of users or the particular medical building affected by a performance degradation and how it impacts patient-care experience.

nGeniusONE Platform Offers Seamless Top-Down Workflows

In order to help healthcare IT teams address EHR, e-prescription, imaging, and UC&C quality issues, the nGeniusONE platform relies on the power of ASI. The data is efficiently organized so that it can be viewed by a range of keys, such as locations (i.e., community of users), quality of service (QoS) level, codec, VLAN, servers and applications. This enables the nGeniusONE platform to offer a top-down workflow based approach for 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 and service dependencies, supporting healthcare's mission critical applications, whether they are on bare metal, in a private cloud or in a public cloud. This allows the platform to facilitate efficient and informed hand-off of incident response tasks across different groups, fostering IT team collaboration.

nGeniusONE simplifies the challenge for IT in delivering high quality, consistent clinician user experience for healthcare 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 a composite service including specific EHR server components, imaging web components, key middleware, service enablers, backend databases, and load balancers 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 healthcare IT services. This enables IT teams to analyze the service delivery environment and discover the client-server relationships and overall messaging performance.
 - **Universal and HL7 Monitors** – Service monitors enable IT teams to quickly triage and isolate the sources contributing to performance degradation within multi-tier environments, including Web servers, Active Directory servers, application servers, backend databases, load balancers and enabling services to provide holistic visibility into the performance of healthcare services. Specifically, the HL7 Monitor provides comprehensive analysis of HL7 activity, tracking successes, failures, latency, retransmissions and response times for HL7 message types – Administrative, Scheduling, Documentation and Other to pinpoint root cause of interoperability issues.
 - **Session Analysis** – Session Analysis views help IT teams analyze transaction latencies, network-related information (e.g., Average Response time and QoS class assignments), as well as detailed session and flow information for specific healthcare data and voice applications.
 - **Packet Analysis** – Integrated nGeniusONE Packet Analysis enables IT teams to perform deep-dive protocol level analysis and forensic evidence collection of healthcare applications and services, such as specific vendor EHR, e-prescription application, imaging service, and/ or revenue cycle management applications.
- 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, healthcare IT teams can contextually drill down to the Session and the Packet Analysis layers.

Benefits of nGeniusONE Solution

- **Triage Issues Quickly** – Decreases MTTR with end-to-end, comprehensive service visibility that enables IT teams to quickly research healthcare application performance and interoperability issues and pinpoint the source of problems impacting prompt, secure healthcare services
- **Protect Patient Care Experience** – Rapidly troubleshoots problems with application services that depend on service enablers, like DNS, AD/LDAP, DHCP or RADIUS, to restore essential healthcare services to quality performance for patients, physicians and staff.
- **Improve IT Team Collaboration** – The platform improves MTTR by enabling collaboration between network, application, server, and UC teams by providing a common ASI dataset and workflows across all tiers of healthcare application services.
- **Single Solution Supporting All Application Layers** – Enables continuous monitoring of performance across the multi-vendor infrastructure and healthcare application services environment with a single solution
- **Optimize Available Bandwidth** – Analysis of bandwidth-intensive imaging services alongside voice and data applications, to help healthcare organizations optimize the environment with directed capacity changes and upgrades
- **Monitor Data, Voice, and Video Performance within a Single Solution** – Combined visibility of data, voice, and video helps healthcare organizations optimize the performance of all services across the converged IP network.

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