



Using the nGenius Service Assurance Solution to Assure Delivery of Voice Services

The nGenius® Service Assurance Solution is an application and network performance management platform that enables organizations to validate, optimize and troubleshoot VoIP services in the context of all other applications on the network. With truly unified views and analysis of voice, video and data traffic derived from actual network packets, NetScout® Systems, Inc. is able to provide both broad coverage and deep specialization to assure service delivery and simplify IT operations.

While a majority of organizations have evolved their telephone services from legacy analog PBX systems to dynamic Voice over IP (VoIP) and unified communications solutions, dealing with the convergence of voice, video and data traffic in the service delivery environment continues to raise new challenges. Networks are becoming more complex and the services that reside on them are more diverse than ever before – yet end users expect and require the same level, if not better, quality from VoIP telephone service as they received with legacy voice systems in order to work productively. It is also vital that these new voice initiatives do not degrade performance of key business data applications, or vice versa. Some of the challenges involved in managing the performance of converged networks, include:

- The modern IP network consists of converged voice, video and data services that must coexist in the same environment; however, it is very common for these services to compete for bandwidth and resources which can cause service delivery issues. IT organizations must have visibility into VoIP-specific metrics as well as a unified view of all services in order to properly manage service delivery.
- IT Organization need the ability to convey VoIP quality of experience metrics to outside stakeholders by using easily understood and widely accepted scoring methodologies, as well as understand what factors are impacting end-user quality of experience.
- Quality of service (QoS) classes provide dedicated priority levels to assure voice service delivery, however, QoS mis-configurations can wreak havoc and affect the delivery of not only voice, but also other key business applications. IT managers need clear and precise data that can provide insight into where these mis-configurations exist in order to properly address service delivery issues.
- In the past, the most common method of approaching service delivery issues – voice or otherwise – was to add more bandwidth or upgrade network hardware. Today's IT organizations are challenged to get to the bottom of bandwidth and performance issues with their existing infrastructure and resources and avoid costly hardware and bandwidth upgrades.
- IT organizations can benefit greatly by being more proactive about service delivery management and preemptively recognizing conditions that indicate a potential issue. IT managers need automated behavioral analysis that understands the environment and delivers action-oriented alerts when usage deviates from "normal" patterns without having to constantly adjust static threshold levels to support an ever-changing environment.
- The best designed service delivery environments will inevitably experience intermittent problems resulting in countless hours wasted waiting for the incident to reoccur. In order to properly address the issues contributing to performance degradation, IT organizations require the ability to capture, store and analyze the actual packets from the time the issue occurred and intelligently focus on the underlying conditions that caused the disruption.
- IT organizations must implement systems and tools that are scalable, flexible and highly manageable to align with unique environments but also to protect the integrity of the data. 24 x 7 hardware availability is critical in order to provide a comprehensive view of application delivery.

Meeting the Need

The nGenius Service Assurance Solution leverages packet-flow data derived from real traffic traversing the network to provide the deep visibility and action-oriented data needed to:

- Effectively manage network and application performance including Unified Communications and Voice services
- Understand voice quality by leveraging MOS and R-factor monitoring with direct linkage to packet impairment views that have a direct impact on quality of experience
- Optimize the existing infrastructure to achieve maximum performance levels and effectively plan for future capacity requirements
- Validate new and existing voice services and policies and network parameters
- Identify emerging issues to predict service delivery issues
- Speed problem resolution to minimize service degradation and user impact

Effectively manage application and network performance

with unified visibility that provides the ability to view voice, data and video services side-by-side in order to understand the interrelationships of all services that traverse the network infrastructure. Viewing traffic from multiple applications correlated and displayed in a single view, the nGenius Service Assurance Solution reveals the impact that applications have on each other, and eliminates the need for individual point products for each application type.

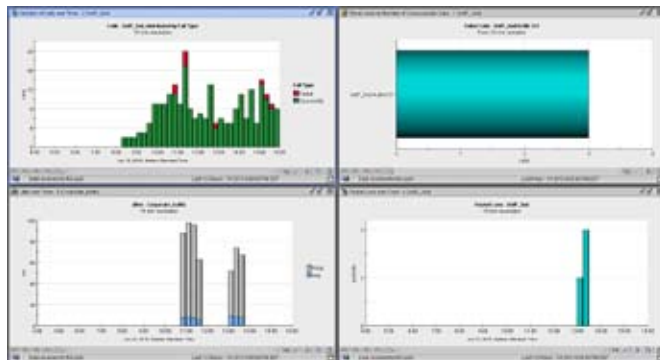
Tool Consolidation



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The unified visibility provided by the nGenius Service Assurance Solution delivers a common set of views and reports for voice, video and data. This unified view enables IT organizations to improve operational consistency and enable better collaboration, reduce service delivery complexity, and save time and training costs when compared to technology-specific point tools.

For example, the introduction of a new bandwidth-intensive video service could have an immediate impact on latency-intolerant voice services. If the video service consumes bandwidth normally used by the voice service, jitter or increases in latency could occur and impact the voice user's quality of experience. Monitoring these voice-specific metrics at the time that the video service is active provides crucial data showing the impact of the video service on voice delivery. Using real-time and historical views coupled with long-term reporting provides a clear understanding of service interrelationships to speed problem resolution and optimize service delivery.



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Optimize the infrastructure and plan for future capacity with capacity planning, “worst link” and short- and long-term trend views. The nGenius Solution provides an unprecedented understanding of how voice services are delivered across the network infrastructure, showing what areas of the network are not performing at peak efficiency. This data allows IT organizations to make possible changes to the existing network infrastructure to better supporting more services and users and/or avoiding upgrades in bandwidth or hardware. These optimization practices help to reduce capital expenses and lower the total cost of ownership by extending the life of existing network and application resources.

Understand quality of experience with mean opinion score (MOS) and rating factor (R-factor) assessment that delivers high-level voice quality monitoring with direct linkage to packet impairment views and evidence including jitter, packet loss, discards, duplicates and delays to provide critical insight to what factors are impacting quality of experience.

Validate new and existing voice services and policies by viewing the impact of quality of service (QoS) classes individually and holistically. The nGenius Solution delivers the ability to classify several QoS levels to a single QoS Group. Once defined, users can view all QoS classes together or individually, revealing how services are mapped to specific classes. For example, if the IT team defines that all voice QoS levels map to a “platinum” class, all file transfer services to a “gold” class and all other data services to a “silver” class, the nGenius Service Assurance Solution can quickly recognize QoS mis-configurations. By viewing all applications found in the “platinum” class the nGenius Service Assurance Solution could quickly recognize if File Transfer Protocol (FTP) is running over a dedicated voice QoS classification. Further investigation can quickly show where the mis-configuration resides in order to rectify the problem.

Predict service delivery issues with intelligent early warning notification that leverages key performance indicators (KPIs) and automated behavior analysis with action-oriented alerts. This functionality understands how the network is used and recognizes deviations from normal usage patterns. The detection of a change in behavior triggers an alert containing the conditions that indicate a potential problem. The process enables IT staff to

recognize problems sooner and diagnose the cause before the end user is impacted and calls the help desk.

Speed problem resolution with forensic analysis that leverages intelligent Deep Packet Capture (iDPC), enabled by nGenius InfiniStream® appliances, delivers industry-leading statistical performance monitoring, efficient packet indexing and storage, and streamlined retrieval and analysis, including voice playback. By leveraging iDPC to capture and store packet data for retrospective analysis, the nGenius Service Assurance Solution enables focused diagnosis of voice service delivery issues such as intermittent dropped calls and end-user quality of experience problems.

Enterprise-class Solution

The nGenius Service Assurance Solution provides end-to-end scalability and a common set of data metrics to enable cross-team collaboration, and unprecedented reliability to ensure always-on monitoring.

- The nGenius Service Assurance Solution delivers “high-definition” visibility that displays all network traffic, in real time, from the network layer through the applications layer for any application type across the entire enterprise. With a broad range of available data sources, the nGenius Service Assurance Solution facilitates a unified view of complex converged network environments.

- The nGenius Service Assurance Solution provides the ability to extend service delivery visibility to all members of the IT organization, regardless of position and responsibility, while at the same maintaining the integrity of the system’s data.
- nGenius InfiniStream appliance models offer optional redundant power, hot-swappable disks and RAID arrays for 24x7 operation and to make sure service performance data is available when it is needed.
- Stand-by server configurations can be added to nGenius Service Assurance Solution deployments to support disaster recovery initiatives. This enables the ability to switch from the primary nGenius Service Assurance Solution server to the stand-by server during times of disaster to maintain a historical data timeline.

In order to provide industry-leading VoIP capabilities within the nGenius Service Assurance Solution, NetScout has collaborated with manufacturers of widely deployed voice systems. The nGenius Solution has been licensed and certified on voice service systems such as Cisco Unified Communications Manager and IP Phones, and Avaya S8700 Media Server and S8300 Media Server running Avaya Communication Manager. This vendor-neutral approach enables the nGenius Solution to deliver highly-valued service performance metrics regardless of infrastructure hardware or different VoIP vendor systems.

Specific nGenius Service Assurance Solution Voice Service features and benefits include:

Feature	Benefit
Intelligent Early Warning	Identify voice service delivery problems sooner; help reduce end-user calls to the help desk; predict and help prevent degradations and outages; minimize the impact of problems on voice services; correlate data across the service delivery environment.
Network and Application Performance Management	View nearly all services along with voice, as well as their interrelationship to understand how different services impact each other; enable a high-performance voice service delivery environment; assure end-to-end, always-on delivery of voice services.
Optimization and Planning	Minimize or delay incremental and unnecessary investments; keep the existing voice service delivery environment running more efficiently in order to avoid lost revenue and cost of downtime; minimize total cost of ownership; forecast bandwidth growth and capacity shortfalls; enable effective video and voice initiatives.
Service and Policy Validation	Assure that defined network policies and QoS class definitions deliver the expected results; view how voice traffic is distributed among different service delivery paths; validate and optimize usage policies to prevent costly expenditures.
Forensics and Historical Analysis	Improve system reliability and prevent downtime by resolving voice delivery issues quickly; enable collaboration across IT groups to simplify; accelerate problem resolution. Improve system reliability and prevent downtime by resolving voice delivery issues quickly; enable collaboration across IT groups to simplify; accelerate problem resolution.

The nGenius Service Assurance Solution delivers visibility into the following manufacturer-specific protocols:

Cisco Unified Communications:

- H.323
- SCCP - Skinny Call Control Protocol
- SIP - Session Initiation Protocol

Avaya Communication Manager 2.0 and above

- H.323 v2 stack, including
- H.225
- Q.931
- H.245
- H.248 (can be used as gateway control)
- Proprietary extensions
- RTP - Real-Time Transfer Protocol
- RTCP - Real-Time Transfer Control Protocol
- SIP – Session Initiation Protocol(for 3rd party phones)

Nortel IP Phones

- UNISTIM - Unified Networks IP Stimulus (Decode)

Summary

The nGenius Service Assurance Solution is uniquely able to provide a truly unified view of all the components that compose a voice service and place that in context with other applications and services. This viewpoint, taken directly from the actual packets traversing the network, enables IT managers to understand and optimize service delivery. For VoIP environments, the nGenius Service Assurance Solution will:

- Simplify VoIP management by replacing tools managing individual service types with a unified solution that provides early warning and fast resolution of performance issues.
- Improve quality of experience by providing end-to-end visibility into voice, video and data services with meaningful, correlated user experience metrics to ensure dependable service delivery.
- Optimize infrastructure usage with real-time and historical views that trend VoIP service usage and provide technology-focused analysis to avoid trunk congestion and ensure that high-bandwidth applications do not impact latency-sensitive services.
- Improve IT collaboration with a single source of information on unified communications services, and a workflow that breaks down the silos between telephony and data networking teams.

For More information

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