

nGenius Voice | Video Manager

Assuring User Experience in Unified Communications Environments

Highlights

- Proactive performance management of video and voice services
- Real-time dashboard with business relevant Quality of Experience (QoE) based service level alerting and automated troubleshooting
- Deep visibility into end-to-end call quality and session performance across all user devices
- Historical analysis reporting by service, fault, location or device
- Innovative service desk capabilities enable IT Staff to interrogate by extension, phone number, user ID or IP address
- Powerful troubleshooting and diagnostics enable drill down to individual user sessions and calls



Figure 1: nGenius Voice | Video Manager Real-time Dashboard

Enterprise organizations invest significantly in Unified Communications (UC) technologies with the expectation of improving collaboration and business productivity across their organizations. This adoption of UC services to enable better collaboration assumes that service quality will be sufficient for end users to interact effectively. However, today's UC deployments are very complex, require uncompromising interoperability between multi-vendor products and traverse a number of different network domains. While traditional performance monitoring approaches have focused on the network-related performance of these services, there are a myriad of issues that can impair video and voice quality. IT organization must consider the performance of the UC application and network together to accurately understand and assure UC service quality. While network performance attributes have been a reasonable proxy for video and voice service performance, IT organizations must also measure at the application level to completely characterize the quality of UC services. Consequently, to achieve a true representation of user experience, IT organizations must look beyond basic network performance to understand how UC applications behave.

Product Overview

The nGenius® Voice | Video Manager is a self-contained UC performance management and analysis module for the nGenius Service Assurance Solution enabling comprehensive real-time service management for UC services. nGenius Voice | Video Manager delivers granular application-specific metrics for IP-based telepresence, video and voice session transmission and conversation quality to characterize real-time service performance and the true user experience. This enables IT organizations to obtain actionable visibility into the end-to-end behavior and quality of UC applications and services. Supporting a broad compliment of UC technologies, vendors and services, the nGenius module combines proactive service management, intelligent troubleshooting, automated diagnostics, flexible reporting and innovative service desk support to reveal UC application-level behavior on a per-user, per-call basis. nGenius Voice | Video Manager collects real-time IP traffic metrics from strategic instrumentation points along the call path, from endpoints, and from data collected from VoIP call controllers and Session Border Controllers (SBCs).

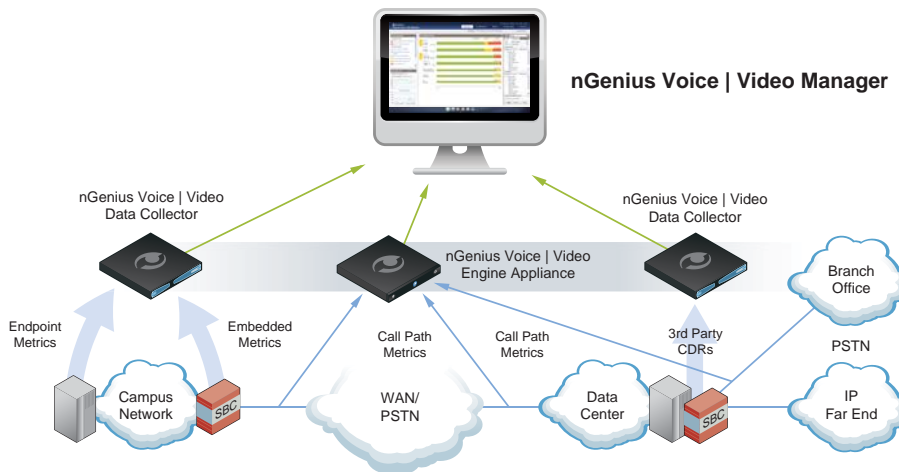


Figure 2: Collecting user experience metrics end-to-end

nGenius Voice | Video Manager enables the IT organization to understand application-level behavior and its impact on user experience to quickly isolate service impact beyond network performance. Powerful filters enable quick analysis by traffic type, location, geography, function, specific user groups. Rich quality measurements for voice services include echo, speech level, noise level, speech distortion, and listening and conversational quality. Video-related measurements identify the impact of IP impairments and application issues.

Support for Any UC Vendor

nGenius Voice | Video manager supports highly complex multi-location, multi-vendor environments. Quality measurements and assessments are agnostic of any particular vendor platform and can assess virtually any UC technology vendor environment. Whether the service is voice or video, desktop or room-based, soft-client or fixed phone, assessment methods are applied in a consistent manner. Measurements can be made across service types and for complex multi-vendor deployments. Measuring Real Time Protocol (RTP) streams, nGenius Voice | Video Manager assesses UC service performance across a wide range of VoIP platforms including, Cisco®, Avaya®, Nortel®, ShoreTel®, Siemens®, Mitel®, NEC® and many others. Video systems are supported from vendors including Cisco, Tandberg®, Polycom® and LifeSize®. Most unified desktop solutions are supported, with unique endpoint metrics from Microsoft® Lync™, IBM® Sametime®.

Real-Time UC Session and Call Measurements

nGenius Voice | Video Manager measures and analyzes RTP stream and payload by leveraging highly efficient, distributed data gathering from intelligent data sources deployed across the UC service delivery chain. The solution collects UC performance metrics in real-time along call paths using high definition packet flow analysis, from mid-point appliances and embedded agents in end-points, to deliver a highly accurate assessment of UC media stream quality and performance. nGenius Voice | Video Manager also dynamically measures in real-time and extracts granular call and session quality as well as user experience metrics from active UC media streams. nGenius Voice | Video Manager collects and correlates these metrics to provide a unique view into UC service behavior with granular per-user, per-session QoE assessments.

Media stream performance and user experience measurements are collected by appliances deployed along the call path, at traffic aggregation points, at the point of demarcation, from soft-clients, or from physical desktop devices. Call Data Records (CDRs) from call or session managers can also be collected to identify called and calling party information. CDR data is correlated with call/session media stream metrics into a single call/session record. nGenius Voice | Video Manager collects all metrics from distributed measurement points across the service delivery environment and correlates them

for analysis, reporting and diagnosis of faults. By leveraging a wide range of measurement points to fully assess the quality and performance of UC services, nGenius Voice | Video Manager leverages the following for measurements:

- nGenius Voice | Video Engine Appliances – dedicated UC deep packet analysis appliances
- nGenius InfiniStream® appliance – combined measurement of data traffic and UC traffic from a single device (future support)
- Measurements from video and voice agents embedded in IBM and Microsoft UC application soft-clients
- CDR data leveraged from IPT session managers and Session Border Controllers (SBCs)



Figure 3: *Troubleshoot View* of a high level service performance summary

Comprehensive Performance Management with Seamless Integrated Workflows

nGenius Voice | Video Manager supports a comprehensive range of UC service performance management and analysis tasks. An intuitive integrated dashboard provides real-time proactive service level alerting and quality indicators for all video and voice sessions. nGenius Voice | Video Manager proactively analyzes all UC service traffic to identify emerging quality affecting issues. When service performance degradations are identified alarms and QoE events are generated prompting further investigation. The event is paired with links to the calls that are affected by the issue, source devices of the problems and targeted service characterization reports. Although events are used to resolve issues proactively in real-time, they are also stored for historical reporting and performance trending.

IT staff can seamlessly progress from a high level status view into specific user call/session analysis based upon measurements correlated from all data sources and assessment points. Streamlined and flexible workflows enable powerful analysis and troubleshooting activities that support a wide range of proactive and reactive service management tasks. Consequently, IT staff can quickly assess large call volumes, with guided diagnostics, drilling into a

specific user call to quickly identify quality problems, triage impact and isolate the root cause of degradations. For less technical IT staff, automated diagnostics enable a guided troubleshooting workflow that simplifies and accelerates problem resolution. These views range from high level service summaries down to individual users session and stream analysis.

Building on its rich heritage, nGenius Voice | Video Manager offers five cross-integrated views that provide progressive, meaningful and relevant metrics that allow IT staff to quickly retrieve the precise information needed to resolve problems with video and voice sessions as they occur.

Monitor

The primary *Monitor View* delivers a powerful at-a-glance real-time summary of overall UC service health and performance levels. IT staff can progress from this dashboard to underlying data for more detailed analysis to quickly identify problems affecting users. From this dynamic console, IT staff has a unified view of Enterprise-wide video and voice application performance with up-to-the-minute insight into QoE events, service degradations, call counts, active alarms/alerts, along with a breakdown of video and voice Key Performance Indicators (KPIs). Each identified event provides contextual linkage to underlying metrics needed to

triage and resolve problems as they occur. The *Monitor View* is updated in real-time, including updates for calls in progress, at user definable increments and IT staff can define relevant alarms and alerts to meet their particular operating environment requirements.

Troubleshoot

The *Troubleshoot View* provides experienced IT staff with a contextual analysis path into network and payload details for UC sessions. This view enables more technically skilled users the ability to drill-down into a range of detailed performance metrics to quickly identify problem areas and pinpoint the source of UC service degradation. Sessions and calls can be assessed by grouped endpoints or by a per user session with detailed call level performance metrics and powerful filters, enabling flexible analysis based upon traffic type, location, geography, function, user groups. Calls or sessions that have been assessed across multiple locations are presented in an easy-to-view network-oriented visualization displaying correlated metrics from along the service delivery chain. Consequently, IT staff can quickly identify which users are experiencing video and voice quality problems and empower them to rapidly identify and triage performance problems and assign issues to the correct service teams.

Status	Calling party	Called party	Call start time	Call duration	Call diagnostics	Calling device	Called device	Call info
201	102	204	Jan 11, 2011 12:02:18	2m 00s	Voice level from IP Phone 2 is very low ...	IP Phone 2	IP Phone 1	
204	102	204	Jan 11, 2011 12:01:43	2m 00s	Voice quality from IP Phone 1 is poor due to jitter ...	IP Phone 2	IP Phone 1	
204	102	204	Jan 11, 2011 12:01:03	2m 00s	Voice quality from IP Phone 1 is very poor due to jitter ...	IP Phone 2	IP Phone 1	
204	505-2345	102	Jan 11, 2011 12:00:15	2m 00s	Media Gateway 1 is producing a lot of echo	IP Phone 2	Media Gateway 1	
204	102	204	Jan 11, 2011 11:59:36	2m 00s	Voice quality from IP Phone 1 is poor due to jitter ...	IP Phone 2	IP Phone 1	
204	102	204	Jan 11, 2011 11:58:54	2m 00s	Voice quality from IP Phone 1 is poor due to jitter ...	IP Phone 2	IP Phone 1	
204	102	204	Jan 11, 2011 11:58:53	2m 00s	Voice quality from IP Phone 1 is very poor due to jitter ...	IP Phone 2	IP Phone 1	
204	102	204	Jan 11, 2011 11:56:24	2m 00s	Voice quality from IP Phone 1 is very poor due to jitter ...	IP Phone 2	IP Phone 1	
204	102	204	Jan 11, 2011 11:55:36	2m 00s	Voice quality from IP Phone 1 is poor due to jitter ...	IP Phone 2	IP Phone 1	
204	102	204	Jan 11, 2011 11:55:17	2m 00s	Voice level from IP Phone 2 is very low ...	IP Phone 2	IP Phone 1	
204	102	204	Jan 11, 2011 11:54:51	2m 00s	Voice level from IP Phone 2 is very low ...	IP Phone 2	IP Phone 1	
204	102	204	Jan 11, 2011 11:53:25	2m 00s	Voice quality from IP Phone 1 is very poor due to jitter ...	IP Phone 2	IP Phone 1	
204	102	204	Jan 11, 2011 11:51:51	2m 00s	Voice quality from IP Phone 1 is very poor due to jitter ...	IP Phone 2	IP Phone 1	
204	102	204	Jan 11, 2011 11:51:18	2m 00s	Voice level from IP Phone 2 is very low ...	IP Phone 2	IP Phone 1	
204	102	204	Jan 11, 2011 11:50:33	2m 00s	Voice quality from IP Phone 1 is very poor due to jitter ...	IP Phone 2	IP Phone 1	
204	102	204	Jan 11, 2011 11:50:33	2m 00s	Voice level from IP Phone 2 is very low ...	IP Phone 2	IP Phone 1	
204	102	204	Jan 11, 2011 11:49:25	2m 00s	Voice quality from IP Phone 1 is very poor due to jitter ...	IP Phone 2	IP Phone 1	

Figure 4: Service Desk View of a query

Proactive

Building on the *Troubleshoot View*, the *Proactive View* is specifically designed to provide a more automated troubleshooting workflow. Optimized to empower the less technical IT staff, the *Proactive View* displays critical video and voice service events, with a guided analysis workflow to help quickly pinpoint and isolate service problems. To simplify the troubleshooting process, plain English contextual help is available as the IT user progresses through the workflow. This simplified and automated view enables much broader use across IT organization while promoting better cross-team collaboration as the entire IT organizations will be working from the same data and metrics.

Service Desk

The *Service Desk View* enables integrated service desk support for reactive customer complaints and is specifically targeted for use by first-level support, help desk and staff. The *Service Desk View* enables the support staff to make informed, accurate and factual decisions based on the problem the user may be having, enabling the quick escalation of the user's issue to the right IT team member for decisive resolution. With the *Service Desk View*, a specific voice or video session can be accessed

based upon the user's name, extension or IP address. Upon query, support staff will see a historical list of all calls or sessions for a given user with session-specific details along with identified problems and diagnosis. This enables the immediate identification of service affecting issues as well as recurring faults for any endpoint. As with the *Proactive View*, the *Service Desk View* provides IT staff with a guided workflow that delivers simple, non-technical assessments with suggested actions. Context sensitive help with simple English explanations is also available to speed diagnosis and enable support staff to raise trouble tickets with the correct resolution teams for immediate resolution.

Report

The *Report View* provides a comprehensive range of reporting capabilities that enable the on-demand or scheduled generation of business-relevant reports. IT staff can generate custom reports base upon a wide range of metrics or leverage number of pre-defined report templates for profiling of common performance metrics, service summaries, trending and detailed service characterization and service level reports. IT staff can automate reports to generate regular snapshots or leverage the view to create reports on-demand.

Granular Bi-Directional Session Visibility

nGenius Voice | Video Manager provides granular visibility into the bi-directional stream of a specific user video and voice sessions. The granular visibility into bi-directional session streams enables the assessment of each direction of a user session to quickly determine where performance impairments may have been introduced. For video and Telepresence environments, nGenius Voice | Video Manager can assess dual-party and multi-party conferences, providing a combined view into the multi-party conference session as well as visibility into each individual user session.

Unique End-Device Calibration

Innovative device-specific calibration enables the adaptation of quality measurements to match the unique characteristics of specific endpoints. This ensures that quality measurements and the resulting metrics provide a true representation of a particular device's performance and compensate for error recovery methods and a specific firmware releases.

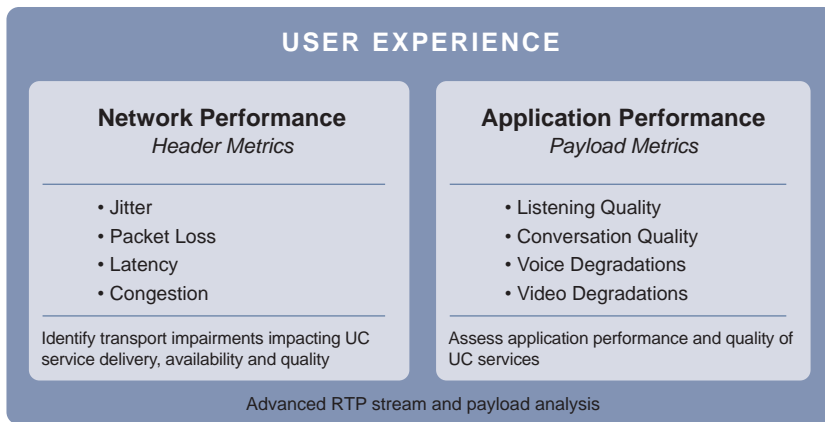


Figure 5: Standards-Based user experience measurements

Standards-Based Measurements

nGenius Voice | Video Manager quality assessment measurements are based upon a number of International Telecommunications Union (ITU) standards for real-time video and voice quality assessment, including ITU P.564 for IP network impairments, and ITU P.561, P.562 and P.563 for packet payload condition. In addition, measurements and quality assessment ratings performed by nGenius Voice | Video Manager are further strengthened as a result of more than 500,000 subjective tests of user perception of quality for video and voice communications.

Video Performance Assessments

For video sessions, nGenius Voice | Video Manager assesses both network and video application performance to reveal session quality and identify the impact of any IP impairments and application performance issues. Assessments are calibrated to specific endpoint characteristics and measurements include video application analysis, video compression artefacts, frame-rate and bit-rate and mid-call coding changes. Measurements will help to identify issues with video codec performance and errors, video payload application behavior and platform driven bandwidth throttling. Measurements will assess audio and video together and identify specific video frames (I/P/B) that may be affected.

Audio Performance

For voice sessions, nGenius Voice | Video Manager assesses both network and application performance to reveal session quality and identify the impact of any IP impairments and application performance issues. Assessments are calibrated to specific endpoint characteristics and measurements include: payload analysis, listening quality and conversation quality. These measurements will help to identify common quality impacting issues such as acoustic echo, delay, noise, signal-to-noise ratios, speech level, and speech distortion.

Complements Vendor-Specific Management Tools

nGenius Voice | Video Manager empowers the IT organization to effectively and decisively manage all the delivery of UC services with a unified, independent view of application and network performance characteristics. This approach complements UC vendor platform management tools by allowing the assessment of the end-to-end performance of UC services across multi-vendor environments independently of a specific UC vendor platform. This independent oversight enables the IT organization to readily identify performance and QoE related issues missed by platform-specific management tools such as multi-vendor interoperability, gateway issues as well as network performance, carrier issues and outside environmental factors.

OSS Integration

nGenius Voice | Video Manager can deliver a wide range of performance and service level metrics to third-party management systems through an API-based interfaces that enables customized reporting and real-time metric access. Integration is available for many industry-leading platforms including those from HP, IBM and CA.

Transport Protocols	Voice/Audio Coding Advanced Calibrated Assessment Metrics	Voice/Audio Coding Standard Measurements	Video Coding Advanced Calibration Assessment Metrics	Video Coding Standard Metrics	Supported Standards
<ul style="list-style-type: none"> RTP RDT MPEG-2 TS MSB (Microsoft - Multicast) 	<ul style="list-style-type: none"> G.711A G.711μ G.723.1 G.722 G.728 G.722.1 G.722.1C iLBC G.726 (16kbps, 24kbps, 32kbps, 40kbps) Siren 16kbps AAC-LD iSAC 	<ul style="list-style-type: none"> GSM 06.10 AMR-NB and WB VMR-WB G.729D and E GSM-EFR EVRC SMV iPCM-WB 	<ul style="list-style-type: none"> H.261 H.263 H.263+/H.263++ H.264 MS RTVideo Windows Media Video 9 	<ul style="list-style-type: none"> MPEG-1 Video MPEG-2 Video MPEG-4 Visual VC-1 JPEG Celb BT.656 DV Uncompressed Video Realvideo Theora 	<ul style="list-style-type: none"> Voice: ITU P.564 Video: ITU P.561 P.562, P.563

Deployment Specifications	Supported Data Sources
<ul style="list-style-type: none"> Appliances Per Server: 20 Max Interfaces per Engine: 4 Interfaces per Manager: 50 Concurrent Streams across solution: 100,000 	<ul style="list-style-type: none"> nGenius Voice Video Engine Appliance nGenius Voice Video Manager Data Collector <ul style="list-style-type: none"> Microsoft Lync (endpoint voice quality via Microsoft Lync Server) IBM Sametime (endpoint video and voice quality via client plugin) Cisco Call Data Records Acme Packet SBC Call Data Records Custom (integrate custom data types using the Data Access Module API)

Minimum System Requirements

Client	Server
<ul style="list-style-type: none"> Category Requirement CPU <ul style="list-style-type: none"> Minimum: 1.8 GHz Intel Pentium M processor, or equivalent Recommended: 2.0 GHz Intel Pentium M processor, or equivalent RAM <ul style="list-style-type: none"> Minimum: 512 MB Recommended: 1GB Monitor with 1280x1024 resolution Link Bandwidth: 1.5 Mbit/s Web Browser <ul style="list-style-type: none"> Minimum: Microsoft Internet Explorer v6; Firefox v3.0 Recommended: Microsoft Internet Explorer v8, Firefox v3 	<ul style="list-style-type: none"> Operating System Software-only options are supported with RedHat 5.5, 64-bit Storage 200 GB RAM 8 GB Processor 2.33 GHz, single quad-core <p>(Virtual machines that fully meet the hardware and operating system specification are supported)</p>



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