



Extending Unified Service Delivery Management to the Branch Office

The nGenius Service Assurance Solution brings visibility closer to the user

Executive Summary

As organizations continue to expand the footprint of the service delivery environment, IT organizations are facing significant challenges associated with delivering a high-quality, consistent experience to all users throughout the organization. Users' expectations have become more demanding regardless if they are seated locally at the organization's headquarters or at a branch office. In addition, activities geared toward reducing costs, growing the organization and delivering localized customer service are adding complexity to the service delivery environment. This new extended enterprise environment demands that the IT organization has visibility into how services are being delivered throughout the network infrastructure.

In order to meet these challenges, NetScout® Systems has enabled the nGenius® Service Assurance Solution to extend end-to-end visibility from the datacenter, through the core and out to the branch office. This end-to-end visibility enables the unified service delivery management functionality that is critical to:

- Optimize the service delivery environment to enable the highest levels of availability and gain by better leveraging existing IT investments
- Protect network and application performance and assure the quality of user experience
- Simplify IT operations by improving workflows, consolidating tools, improving efficiency and lowering the total cost of ownership

Introduction

Today's modern IP network connects everything; from the datacenter, through the core and out to the branch office. Virtually every facet of the organization has become reliant on "always-on" access to applications and services in order to perform day-to-day activities and to meet business goals. This dependence has made reliable service delivery a top operational priority for IT organizations. However, budget, staffing, and resources remain challenging. IT organizations must be able to "do more with less". These significant staffing and resource challenges are compounded by increasing service delivery complexity, higher user expectations and virtualized technologies, making the delivery of a consistent and reliable user experiencing a daunting task. Without visibility to all users, locations, services and their interdependencies, IT organizations are finding that maintaining a consistent level of service delivery is becoming more difficult than ever before.

As the service delivery environment becomes borderless and more complex, IT organizations need to implement a unified approach to managing service delivery that enables better cross-

team collaboration across the IT organization. This unified service delivery management approach must:

- Enable a service-oriented view that combines data from multiple underlying elements and leverages automated behavioral-analysis functionality to recognize anomalous conditions
- Provide an instantaneous understanding of the status of key business services, and preemptively recognize conditions that could impact service delivery
- Deliver consistent and unified metrics that provide a granular understanding of how network, application and service elements are performing within both the virtual and physical environment
- Provide insight to trends in network and application usage and user consumption to identify where and how improvements can be made in terms of optimizing the existing infrastructure and improving the overall efficiency of the service delivery environment
- Gain visibility into how effectively services are being delivered and the impact of policies and optimization services are effecting service delivery
- Understand the impact of new applications and service roll-outs to achieve project goals

Meeting the Challenge with the nGenius Service Assurance Solution

The nGenius® Service Assurance Solution is a unified service delivery management platform that provides comprehensive, real-time network, application and service performance intelligence, allowing the IT organization to assure optimized network and application performance and quality of experience. The nGenius Service Assurance Solution provides always-on network and application visibility with a common and consistent view of service-oriented analysis and reporting functions that enables increased productivity and collaboration across the IT organization with team-oriented workflows. Solution capabilities include:

- Unified aggregate service views with intelligent, automated anomaly detection to understand service-level performance and predict network, application, and service performance degradations in order to minimize or avoid service meltdowns
- Network, application and service performance management with unified real-time and historical views, for critical visibility into today's most complex service delivery environments
- Leveraging nGenius InfiniStream® appliances, packet-level forensic analysis enables deep-packet visibility and granular back-in-time historical analysis to resolve the most difficult application and service delivery problems
- Planning and optimization capabilities showing how resources are being consumed and revealing capacity shortfalls to keep service delivery environments running at peak efficiency and performance levels, to best leverage existing IT technology investments

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- Service and policy validation delivers key metrics and insight into the service delivery environment to validate the impact of the implementation of new network optimization and policies for applications and services

The nGenius Service Assurance Solution brings a unified approach to managing service delivery that empowers the IT organization to dramatically improve the overall quality of service for applications and services delivered across the entire organization. Unified insight into the service delivery environment enables greater service reliability and availability with improved network performance and responsiveness. A unified framework for service delivery management helps the organization lower the total cost of IT operations by consolidating operations into a single cohesive tool set that can be leveraged across the entire organization. This improves IT staff productivity, collaboration, and enables better cross-functional leverage of management tool investments. Consequently, the IT organization gains better insight into the real-time operation of the service delivery environment, reducing the overall total cost of ownership for IT while maximizing network and application investments.



The nGenius Service Assurance Solution enables Unified Service Delivery Management for proper visibility into today's most complex service delivery environments

Comprehensive Data Source Options Enable Deployment Flexibility

NetScout offers a comprehensive family of intelligent data sources to provide packet-flow-based visibility for all applications, users and services that flow across global networks. NetScout intelligent data sources range from nGenius InfiniStream intelligent Deep Packet Capture (iDPC) appliances deployed in strategic, high-bandwidth locations, to real-time hardware and software probes and Cisco® NetFlow collection devices. All nGenius intelligent data sources leverage the Common Data Model (CDM). CDM is a NetScout technology innovation that creates a common set of statistics and metrics across multiple data sources, including hardware-based, virtualized software in virtual environments, or software embedded in third-party network devices. This common architecture derives traffic intelligence regardless of interface type. CDM provides a highly scalable technology foundation that feeds into the nGenius Service Assurance Solution and enables consistent metrics across

a broad-range of interfaces, locations and data sources. To understand the different aspects of each intelligent data source, a brief description is provided below:

- **nGenius InfiniStream Appliances** – iDPC-based appliances strategically positioned across the network collect packet-flow statistics and perform continuous packet capture for back-in-time analysis enabling in-depth troubleshooting of intermittent and truly difficult service delivery issues
- **nGenius Probes** – Traditional hardware-based intelligent data sources that provide deep packet monitoring and analysis of packets as they traverse the network
- **nGenius Virtual Agent** – Next-generation, software-based intelligent data sources implemented as virtualized hardware probe technology for deployment within virtualized computing environments
- **nGenius Integrated Agent** – A software-based intelligent data source that is self-contained virtualized probe software integrated and deployed within a third-party network device to provide high-definition packet-flow visibility at logical network boundaries
- **nGenius Collector** – Hardware appliance that collects Cisco NetFlow and IP SLA-based statistical data

Offering a broad range of intelligent data sources that provide different degrees of visibility, NetScout delivers nGenius Service Assurance Solution users flexible options to support different monitoring objectives at different locations. This allows IT organizations to address the increasing complexity of service delivery in a targeted and cost-effective manner.

Understanding Challenges from a Branch Office Perspective

Today's demanding end users require a high-quality and consistent experience with the services they rely on to perform their day-to-day activities. However, business-driven initiatives are creating considerable challenges for IT organizations, some of these challenges include:

- As application and service hosting continues to be consolidated into datacenters and with the growth of cloud-based services, the IT organization needs to achieve a balance between centralization and the challenges of delivering predictable and reliable IP-based services across distributed environments
- As more customer-facing functions reside at branch offices, a high-level of visibility is required to properly manage service delivery throughout the environment, including out to the branch office, but budgetary restraints often make this approach impractical for organizations with a large number of branch offices
- With application servers that were once housed locally now residing possibly across the world, long round trip time and high latency are more detrimental than ever before as users try to access key business service remotely

In order to assure a high quality and consistent end-user experience throughout the entire service delivery environment, IT organizations need to implement solutions that enable them to achieve always-on visibility across the entire network. This end-to-end perspective provides the critical unified service delivery management functionality that is crucial to understanding the performance of applications and services across the entire network to better assure user experience.

Considerations when Extending Visibility to the Branch Office

As networks become truly borderless, the IT organization is being tasked with delivering consistent performance and always-on access to services and applications to all users, regardless of their physical location or device used to access services. Having visibility in the datacenter, across the campus and to the network edge, closer to the user is essential to tracking service performance levels for all applications and users in a unified way.

In the past, service assurance efforts have been mostly focused at the datacenter and corporate campus. Cost, space, integration and limited local IT resources have presented a barrier to extending always-on service assurance capabilities out to the branch. However, as the value of the branch office continues to increase in terms of revenue generation, customer interaction and other key business operations, IT organizations are quickly discovering that visibility into branch and remote sites is essential. In addition, the level of detail this visibility provides needs to be properly aligned to the importance, size and function of the branch office. Adequate visibility cannot be sacrificed in order to meet budget restraints; adversely, budgetary considerations cannot be ignored when implementing a solution for service delivery management. IT organizations must consider several factors when deciding how to gain the visibility they need at each location.

Right-sizing the Level of Visibility

The business models of many organizations are changing to include branch office architectures in order to provide a global presence, localize customer-facing services, recruit higher levels of talent, and retain resources from mergers or acquisitions. Whatever the reason for leveraging a branch office strategy, it is understood that branch offices can support a multitude of functions from a business perspective. IT organizations need to align the visibility requirements at these location to the impact that not having access to services for these branch users has on the business meeting its objectives. These decisions need to take into account several aspects, including size, primary function, and whether or not key business applications are housed locally.

For example, an organization has several branch offices that interact with customers and by doing so generate revenue. In order to properly support this function, users at that office need to access applications housed within the datacenter at headquarters. In this scenario, service degradation can have a direct impact on revenue and impact how well the organization meets its business objectives. In order to assure service delivery it is critical for the IT organization to have a clear understanding of key service delivery metrics, such as response time and latency. The user being impacted by high latency or longer than normal response time resulting in service degradations or even outages can have significant impact on this branch office. This may lead to customers having to return at a later time when service is restored, which increases the risk of those customers will seek product or service elsewhere. Additionally, if revenue is impacted by service degradations or outages then the necessity for intelligent Deep Packet Capture (iDPC) becomes apparent. Because appliances that leverage iDPC provide 'always-on' packet capture and back-in-time analysis, IT organizations can be confident that if an intermittent or complex service-impacting issue does arise they will have the packet-level details needed to resolve the problem without having to wait for the incident to occur again.

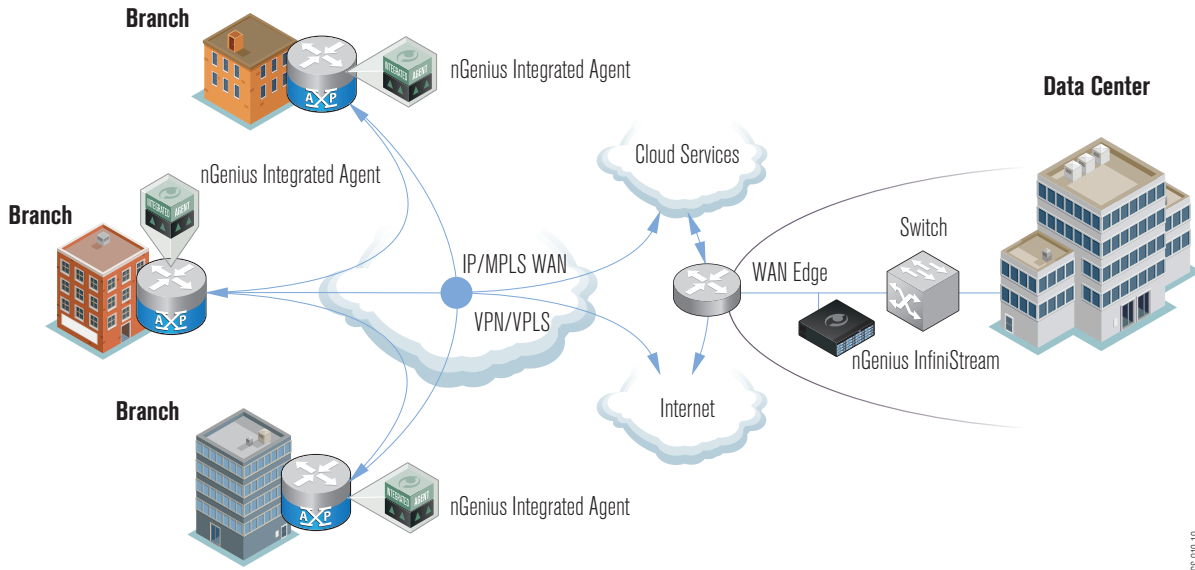
A small branch office that is not primarily revenue generating still requires high-quality, reliable access to services housed within the headquarters' datacenter. In turn, the IT organization must have visibility to response time, latency and other service delivery metrics. However, the need for intelligent deep packet capture may not be as critical and on-demand packet capture is an acceptable alternative. In this situation the IT organizations may choose to take a more cost-optimized approach to gaining visibility at the branch. This can be done using standard hardware-based probe devices or by leveraging software-based probe technology integrated in existing network infrastructure devices.

Other considerations to take into account revolve around if key business application servers are housed locally and the number of employees located at the branch office. Much like remote applications, if these local applications are required to meet business objectives NetScout recommends deploying appliances that support iDPC functionality to provide critical back-in-time forensic analysis. For branch offices that support a large number of employees, such as those from acquisition or mergers, IT organization would want to gain the highest-level of visibility as service-impacting issues could potentially impact a large number of users. Implementing appliances that support iDPC in these large branch offices would provide the level of visibility needed to keep operations moving toward meeting their business goals.

Unified Service Delivery Management for the Branch Office

Regardless of the data source implemented, visibility at the branch office has become crucial for IT organizations to maintain high-quality and consistent service delivery to the end user. This level of visibility allows the IT organization to gain a unique vantage point to how services are delivered to the branch office. It also provides an understanding of the interactions between branch offices and into the cloud when organizations leverage shared resources.




The heightened level of visibility provided by nGenius Intelligent Data Sources enables unified, pervasive and consistent visibility to the branch office and across the enterprise.



By bringing visibility out to the branch office and closer to the user, IT organizations can address branch-specific concerns by leveraging unified service delivery management functionality provided by the nGenius Service Assurance Solution. This visibility supports functionality unique to architectures that leverage branch office strategies to meet business goals, including:

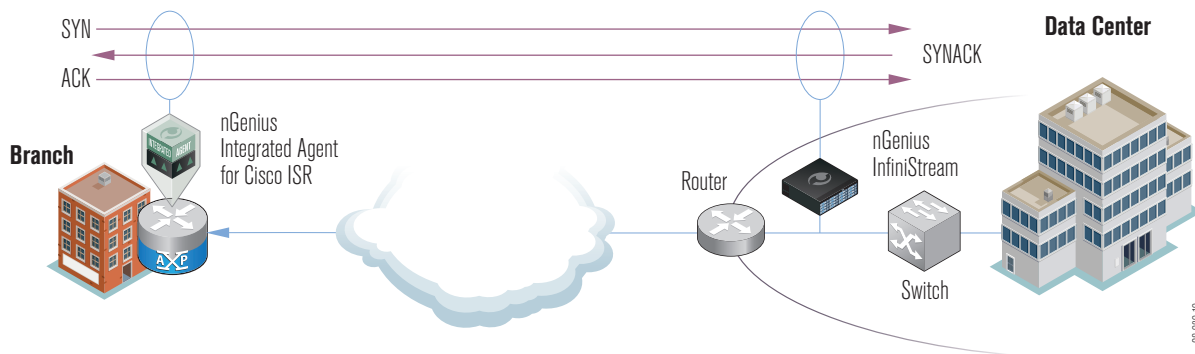
- Enabling a unified view for all services from the datacenter, through the campus and out to the branch office to provide a clear understanding of service performance and health
- Delivering key application, network and service performance metrics such as round trip time, utilization and latency that are critical in order to maintain a high-level, consistent user experience
- Providing insight to how branch offices are consuming resources and effectively leverage existing IT investments
- Delivering the data needed to understand if WAN optimization solutions are meeting expected performance improvements
- Leveraging packet-level data to quickly resolve today's most difficult problems that impact key customer-facing locations

The nGenius Service Assurance Solution delivers a range of intelligent data sources to meet all level of need in regards to visibility at the branch.

nGenius Integrated Agent	nGenius Probe	nGenius InfiniStream 2900-Series Appliance
		
Software-based Virtualized Probe Technology	Hardware-based Probe Technology	Hardware-based Intelligent Deep Packet Capture Technology
Resides on third-party network infrastructure devices*	Implemented via Tap or Ethernet Span Port	Implemented via Tap or Ethernet Span Port
Provides visibility to key service delivery metrics		Provides visibility to key service delivery metrics
1 Gigabyte Capture Capacity		500 Gigabyte Capture Capacity
On-demand Packet Capture		Continuous Packet Capture

*Available for Cisco® 2800, 3800, 2900 & 3900 Series Integrated Services Router

Leveraging two monitoring points from the nGenius Integrated Agent and the nGenius InfiniStream appliance, IT organizations gain an accurate view of response time and latency associated with the delivery of key business services



Unified Service Delivery Management

The nGenius Service Assurance Solution provides unified service delivery management by aggregating critical meta-data from several intelligent data sources – extending from the datacenter, to the network and to the user. This unified service visibility empowers IT organizations to manage services, the network and users in unison, to reduce the underlying complexity and achieve a unified business and service perspective. It is this service-oriented view that is critical to gaining an understanding of the user’s quality of experience.

Application, Network and Service Performance Management

In order to provide a high-quality user experience, the nGenius Service Assurance Solution provides critical application and network performance metrics that identify interrelationships and interdependencies between applications over the network infrastructure. The nGenius Service Assurance Solution leverages industry-proven technology to recognize and monitor well-known, custom-developed, virtualized and Web-based applications and services.

Using a two intelligent data source method, IT organizations are able to gain a more accurate view of response time and latency, opposed to a single intelligent data source strategy. By having visibility at each end point of transactions and viewing the real-time data in a unified manner IT organizations gain the ability to understand how well a service is being delivered to the branch office and also to recognize trends in increasing round trip time and latency that can lead to service degradations or meltdowns.

Optimizing and Planning

Visibility at the branch office provides a clear and concise understanding of which applications, users and hosts are consuming bandwidth. This understanding provides IT organizations definitive information regarding capacity shortfalls which can be leveraged to craft decisions regarding making the process of delivering services more efficient. For example, if a branch office is experiencing significant slowdowns related to a key service, IT organizations can examine the traffic travelling to the WAN to identify any bandwidth-hungry or non-business

related traffic that is impacting the key business service. This provides the IT organization the data they need to put usage policies in place, engage with the application vendor to determine why the applications requires a large amount of bandwidth, find a replacement for the bandwidth hungry application or upgrade the link if needed.

Validating WAN optimization

WAN optimization is becoming a common practice when delivering services to the branch in order to meet users’ expectations around service delivery. However, IT organizations do not have a clear indication whether the WAN optimization process is delivering the level of improvement expected. By having visibility of the data traffic prior to optimization and taking comparable measurements as the optimized traffic enters the branch office using the nGenius Integrated Agent, the IT organization can validate that WAN traffic is being optimized as expected. The nGenius Service Assurance Solution can also aid in identifying which applications and sites would benefit most from WAN optimization.

Resolving Difficult Service Delivery Problems

The nGenius Service Assurance Solution leverages packet-flow data which is critical in resolving today’s most difficult service delivery issues. Whether the branch office is equipped with nGenius Probes or nGenius Integrated Agents that provide on-demand packet capture or iDPC-enabled nGenius InfiniStream appliances, the nGenius Service Assurance Solution provides the most comprehensive and granular-level of service delivery data. Coupled with a logical workflow that consistently monitors key performance indicators (KPIs), provides flow-based service delivery metrics analysis and links to contextual packet-based data, IT organizations are empowered to preemptively recognize service delivery problems, diagnose the users, applications and flows associated, and view the underlying make-up of the actual packets involved. This level of granular detail and efficient workflow provides the ability to proactively resolve service-impacting conditions in order to minimize or avoid the impact on the end user and circumvent service delivery meltdowns.

Conclusion

As organizations recognize their increasing dependence on branch offices to meet business goals, IT organizations need to evolve the way that they approach assuring service delivery to the branch office. In order to maintain a high-quality and consistent level of service delivery, these IT organizations are turning to solutions that deliver unified service delivery management by leveraging end-to-end visibility. By focusing on a unified services view; key application, network and service performance metrics; optimization and planning data; service validation monitoring; and efficient workflows that leverage packet-flow data, IT organizations are extending visibility closer to the user and gaining a true understanding of service delivery environment. It is this unified service management approach that allows today's most agile IT organizations to:

- Optimize the service delivery environment to enable the highest levels of availability by better leveraging existing IT investments
- Protect network and application performance and assure the quality of user experience
- Simplify IT operations by improving workflows, consolidating tools, improving efficiency and lowering the total cost of ownership



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WPSP_14_2010 Rev A