

Unified Visibility into Branch Office Performance

What You Will Learn

The nGenius Integrated Agent for Cisco® Integrated Services Routers (ISRs) integrates industry-leading probe technology from NetScout Systems Inc into Cisco ISRs. The Cisco ISR hosts the self-contained nGenius Integrated Agent software on a dedicated services module, which provides the necessary infrastructure to securely install, run, and manage the nGenius Integrated Agent software without affecting the core routing capabilities.

The combined solution enables the IT organization to provide consistent and reliable service delivery to branch-office users by maintaining always-on visibility into both WAN and branch-office LAN traffic. It also reduces the cost and complexity of monitoring and troubleshooting branch-office performance to help minimize network degradations or downtime and the detrimental effects it can have on employee productivity, customer satisfaction, and revenue generation.

The Challenges of Managing Branch-Office Performance

Today's branch-office users require the same "anytime, anywhere" access to business applications and services, and they expect the same consistent high-quality, reliable experience as their counterparts in corporate locations. However, the increasing use of Multiprotocol Label Switching (MPLS) networks, cloud computing, and software as a service (SaaS), and the trend toward IT resource consolidation are complicating the process of delivering and assuring network and application performance at the branch office.

At the same time that applications and services are being removed from the branch office and consolidated centrally, the number and importance of branch offices is increasing. One reason for this phenomenon is that branch-office employees by nature tend to be either customer-facing or operations-oriented and, therefore, they play a vital role in revenue generation, customer service and support, and profit making. The remote locations, whether they are branch offices, retail stores, clinics, bank branch offices, or classrooms, are an important customer touch point where businesses have total control of the customer experience.

With the heightened status of branch offices within organizations, it is more important than ever to equip distributed workers with ubiquitous and consistent access to information and services. Accomplishing this goal is not as easy as it sounds. Historically, branch offices have often been afterthoughts or additions because of mergers and acquisitions, and have frequently received less-sophisticated and lower-performance network technology and IT services than headquarters or corporate offices. This situation makes it complex to add new services, particularly in organizations without local IT staff, and it has left older branch offices plagued by poor quality of service (QoS) and degraded application response times over the WAN link. However, today's business conditions make it necessary to elevate remote workers' network experience to be comparable to that of employees connected directly to the corporate LAN.

Some of the challenges facing IT staff when managing branch-office environments include:

- End-user complaints of poor response times for applications and services traversing the WAN.
- Lack of visibility into applications and services that initiate in the branch office and do not pass through a central monitoring point, such as SaaS or cloud services, Internet traffic, voice-over-IP (VoIP) communications, or site-to-site traffic in MPLS networks.
- Inability to troubleshoot bandwidth-intensive, latency-sensitive applications, such as VoIP, video over IP, imaging applications, or other local branch-office applications.

- Time and expense to dispatch a technician with a portable monitoring device to troubleshoot intermittent or persistent branch-office LAN and WAN problems.
- Incomplete metrics to enable accurate capacity planning or optimize the branch-office user experience.

In order to assure the delivery of predictable and reliable IP-based services within the branch office as well as across the entire network, IT organizations need cost-effective monitoring solutions for the branch office to reveal how remote network resources are being used, how applications and services are behaving, and how remote users are experiencing the services being delivered.

WAN Latency

According to Nemertes Research, 90 percent of employees do not work at headquarters locations; therefore, assuring acceptable application delivery to branch-office employees over the WAN should be of utmost importance to IT managers because of the sheer number of employees it affects.

One of the challenges facing the IT organization is using critical business applications that were developed in a LAN environment and having them perform acceptably in a WAN environment. Poor application performance that becomes amplified over the WAN can significantly affect employee productivity - as well as having customer service and revenue implications. The ability to determine whether application performance degradations are due to inadequate bandwidth, QoS problems, server delay, or poor application design is critical to understanding WAN latency at the branch office.

Cloud Computing

Cloud computing provides the resources and services - hardware, networks, storage, servers, and interfaces - that combine to deliver applications, infrastructure, and storage over the Internet based on user demand. Cloud computing increases agility, flexibility, and responsiveness of the delivered service.

However, cloud computing can also create challenges in areas such as provisioning, security, and performance. Accessing applications remotely introduces concerns around latency, bandwidth constraints, and service downtime. As IT organizations increase adoption of both private and public cloud computing, the WAN will be involved in an increasing percentage of instances when users access applications and storage over the WAN.

To reap the benefits of cloud computing, organizations need endpoint visibility into application performance to provide the analysis, optimization, service validation, and control to meet these new challenges and unlock the full potential of cloud computing.

Site-to-Site Computing in MPLS Networks

MPLS is an important initiative in many enterprises today. IT organizations are rolling out MPLS upgrades, designed to deliver multimedia voice, video, and data in prioritized QoS classes, to regional and remote offices as they look for new ways to lower cost, extend scalability, improve reliability, and secure their networked data. However, the packet labeling and security services characteristic of MPLS networks (for example, encryption and VPNs) typically obscure views into application flows and activity in MPLS trunks. Ensuring high-quality delivery of all applications and services across an MPLS network, at all times, for all offices and users is essential for today's enterprises.

Of all the services that have benefited from MPLS, VoIP is one of the most widely deployed. Where an inventory check at a retail store will go through a distribution center or data center and can be centrally monitored and managed, a phone call from one store manager to another will not. Quality concerns that may involve latency, packet loss, jitter, bandwidth constraints, or QoS class misconfigurations can be captured and analyzed only with complete visibility at each location.

Troubleshooting Branch-Office Performance

The current trend toward consolidating IT resources and staff in the data center provides many benefits, including improving service levels, increasing availability, and reducing costs, but it also comes with some downsides. With fewer IT staff available at the branch office, the ability to troubleshoot revenue-generating, bandwidth-intensive, or latency-sensitive applications, such as VoIP, video over IP, or other local branch-office applications, is affected. Often a technician with a portable protocol analyzer must be dispatched to the problem site at considerable time and expense to capture the packet stream to enable forensic analysis of both persistent and intermittent problems. The nGenius Integrated Agent provides the ability to monitor local LAN environments remotely and perform on-demand packet capture for forensic analysis that can mitigate these downsides of consolidation.

Infrastructure Optimization and Capacity Planning

Network capacity and infrastructure planning is about balancing the needs and expectations of branch-office users with the realities of budgeting. To manage network capacity efficiently, it is not enough to measure overall traffic usage. Network managers need insight into which applications are using the link, whether or not those applications are business-related, when those applications are active, what QoS category they are assigned, and who is using those applications.

This level of information provides the details necessary to put usage policies in place, engage with the application vendor to determine why the applications require a large amount of bandwidth, find a replacement for the bandwidth-hungry application, or upgrade the link if necessary. Without these facts, corporations are forced to blindly upgrade to higher-speed networks and absorb higher operational costs.

nGenius Integrated Agent for Cisco ISR

The nGenius Integrated Agent software extends unified service-delivery management capabilities into the branch office by taking advantage of the Cisco Integrated Services Router as an intelligent instrumentation point. As a virtualized implementation of NetScout's widely deployed nGenius Probe technology, the nGenius Integrated Agent transparently extends high-definition packet-flow monitoring and analysis capabilities - including application recognition and monitoring, network performance metrics, response time and key performance indicators, alarming and event notification, and on-demand packet capture and analysis - to the network edge and branch office.

This integrated approach removes the cost and operational obstacles that have traditionally limited the IT organization's ability to monitor branch-office locations. As a result, IT staff can now achieve always-on visibility into the performance of applications and services on the WAN and local branch-office LAN to better assure the branch-office user experience.

Analysis with nGenius Performance Manager for a Unified Viewpoint

The nGenius Integrated Agent requires nGenius Performance Manager to view real-time and historical analysis and reports. nGenius Performance Manager unifies data from multiple nGenius Integrated Agents or other intelligent data sources to provide a unified viewpoint that enables IT managers to:

- Manage application and network performance to protect against service degradations
- Optimize and plan for capacity changes to minimize unnecessary bandwidth changes
- Validate service levels of both new and existing applications to assure quality of experience (QoE)

The nGenius Integrated Agent also works in conjunction with nGenius Service Delivery Manager to simplify and automate managing service quality across physical and virtual service-delivery environments by providing business-aligned views of how services are performing and consumed. It also provides comprehensive intelligent early warning of emerging performance problems to help optimize and protect the delivery of business applications and services and predict and prevent performance problems.

Far-Reaching Benefits

The nGenius Integrated Agent, when deployed with nGenius Performance Manager, offers tangible benefits over using a traditional hardware-based probe for monitoring branch-office environments. The benefits are discussed in the following sections.

Low Total Cost of Ownership

Because the nGenius Integrated Agent is hosted on Cisco ISRs using either a Cisco Services-Ready Engine (SRE) or Cisco Enhanced Network Module (NME), which have their own processors, storage, network interfaces, and memory that operate independently of the host router resources, it reduces both capital expenditures and operating expenses of monitoring the branch office:

- Reduces hardware and cabling costs: Piggybacking off the Cisco ISR eliminates the need for a dedicated hardware probe, cables, power cords, and network interface cards (NICs), reducing the cost of deployment by up to 65 percent over an entry-level hardware probe.
- Lowers power, cooling, and space costs: Unlike hardware-based probe appliances, Cisco SRE modules do not take up any additional physical space, freeing rack space in the branch office. Also, Cisco SRE modules are highly energy-efficient, consuming only a fraction of the power required by typical branch-office servers and appliances.
- Decreases field deployment costs: The Cisco SRE is a services-ready deployment model that enables remote provisioning of the nGenius Integrated Agent on the modules at any time, shortening the time to deploy and eliminating travel expenses to the branch office.
- Reduces troubleshooting expenses: The ability to capture packet data locally at the branch-office level means that IT organizations can troubleshoot a vast majority of problems on the branch-office WAN or LAN from the data center without having to dispatch a technician or a portable protocol analyzer to the site, saving travel costs and reducing productivity loss of the technician due to time out of the office.

Operational Efficiency in the Branch Office

Real-time monitoring of the WAN and branch-office LAN, centralized analysis of multiple nGenius Integrated Agent devices simultaneously, and on-demand packet capture improve operational efficiency in the branch office:

- Facilitates optimal network availability and user experience: Always-on monitoring of the branch-office WAN and LAN with granular alarming facilitates troubleshooting, response-time analysis, capacity planning, service and policy validation, and analytics and intelligent early warning.
- Speeds and simplifies remote troubleshooting: Centralized access to branch-office network and application performance data and on-demand packet capture of both the WAN and local LAN minimize the need for technician or device dispatch, accelerating problem resolution and reducing network downtime.
- Aids capacity-planning activities: Having factual information on which to base upgrade decisions empowers the IT organization to optimize the service-delivery environment by taking better advantage of existing investments and to roll out new services with confidence. The nGenius Integrated Agent provides granular insight into which applications are using a given link, whether or not those applications are business-related, when those applications are active, what QoS category they are assigned, and who is using those applications.

The nGenius Integrated Agent is not just a WAN capacity-planning tool, however. Because the nGenius Integrated Agent has two monitoring interfaces - the primary interface for the WAN and a secondary interface for the LAN - IT managers can observe the branch-office LAN to see how changes in Fast Ethernet traffic and associated growth in demand affects the need for Ethernet aggregation or 1 Gigabit Ethernet.

Enterprisewide Operational Consistency

Deployed as part of a pervasive instrumentation strategy, the nGenius Integrated Agent is just one of many intelligent data sources offered by NetScout Systems that are designed to meet a broad range of monitoring needs:

- **Monitors site-to-site or cloud-based services:** Branch office-to-branch office and cloud services typically bypass the data center or central office, where monitoring has traditionally been located. Located on the branch-office egress router, the nGenius Integrated Agent offers a cost-effective and superior solution for monitoring and troubleshooting services emanating from the branch office.
- **Enables true end-to-end visibility:** The nGenius Integrated Agent can be deployed transparently into existing nGenius Performance Manager environments to extend visibility to branch-office environments to provide a unified view of enterprisewide network and application performance. nGenius Performance Manager works with a variety of NetScout intelligent data sources to provide end-to-end visibility of physical and virtualized networks from the data center, through the core, within virtualized computing environments, and to remote sites. These data sources include nGenius InfiniStream[®] appliances with continuous intelligent packet capture within core, access, and data center environments; nGenius Virtual Agent for monitoring VMware virtualized computing systems; and nGenius Collector for capturing NetFlow, sFlow, and jFlow statistics in secondary links.

Remote Administration

The nGenius Integrated Agent simplifies management of branch-office networks and reduces the cost of IT operations:

- **Reduces management complexity:** The nGenius Integrated Agent can be deployed remotely on preinstalled Cisco SRE modules and configured and managed remotely from the nGenius Performance Manager console, saving time and effort on ongoing maintenance and management.
- **Optimizes IT staff productivity:** The data collected by the nGenius Integrated Agent and analyzed and displayed in nGenius Performance Manager can be accessed by the network, application, and security managers, improving IT staff collaboration.
- **Simple, single-package installation:** Cisco Application Extension Platform (AXP) software and nGenius Integrated Agent software are bundled for ease of download and deployment.

Conclusions

As enterprises recognize their increasing dependence on branch offices to meet business goals, IT organizations need to evolve the way they manage 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 the nGenius Integrated Agent. By continuously monitoring WAN and LAN traffic at the branch office, IT organizations gain a true understanding of the service-delivery environment. It is this unified service-management approach that allows today's most agile IT organizations to:

- Optimize the service-delivery environment at the branch office and enterprisewide to reduce downtime.
- Protect network and application performance and assure the quality of user experience to maintain optimal productivity.
- Simplify operations by improving efficiency and collaboration.

For More Information

For more information, please visit <http://www.netscout.com> or contact NetScout sales at 800 309-4804 or 978 614-4000.



Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

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