



Cases in Point

- Using the *nGenius* Solution, a West Coast power company discovered a data back up running during peak hours that was causing performance degradations for its mission-critical power flow application.
- In the next few months a Western US electric company has been using the *nGenius* Solution they have uncovered an issue with VoIP QoS classifications, back ups during peak business hours, and bottlenecks with the centralized file/print services.
- A large US generation and transmission cooperative uses the *nGenius* Solution's sophisticated application recognition to troubleshoot degradations with their custom energy management applications.
- A Midwestern US power company uses the *nGenius* Solution to ensure application response time, allowing technicians to minimize the time the plant is offline.

The *nGenius*® Solution – Empowering Energy Companies With Application Performance Analysis

Introduction

North America's and Europe's energy infrastructures are evolving to take advantage of enhancements that will reduce the cost of doing business while making power generation and transmission more efficient. Adoption of emerging technologies, such as automated meter management, remote asset monitoring and mobile workforce management, are increasingly being viewed as ways to defer costly upgrades, prevent failures and streamline operations. However, all of this new technology is dependent upon having a reliable and fast data network.

An electric power company's day-to-day operations are extensive. They include generating power, sourcing supplemental power supplies, installing and maintaining power lines, customer meter readings, billing and collection, as well as buying and selling overcapacity with other energy companies. However, their main goal never changes, delivering power in a consistent manner to all. Meeting this goal requires continual communications related to power demand and its delivery, as well as prompt information exchanges among all electric company employees. It further requires the networks and applications supporting these communications to be continuously available and running at optimal efficiency. Assuring effective delivery of networked business services demands the power and flexibility of the *nGenius* Solution.

Network Considerations

Power generation and transmission companies depend on their data network for immediate updates regarding the production and delivery of power to their customers and for sharing information across distributed facilities. At major company locations, communication among the departments are typically performed over Gigabit Ethernet LANs, while those among geographically distributed headquarters, data centers, power plants and other energy resources are conducted over high-speed WAN circuits. Local billing offices often communicate with headquarters and data centers over lower speed WAN connections. Business applications typically running in electric power company networks might include Citrix, SAP, Oracle, e-mail, and new web-based or custom applications.

Business Application Challenges

Distributing power consistently to their customers is the most critical business challenge for energy producing companies - period. Their charter is, above all, to maintain constant and consistent service delivery. Beyond that, like most other businesses, they want to increase revenue, minimize costs, and improve overall ROI. A few challenges unique to energy companies include:

- Buying and selling additional power at competitive rates when existing plant facilities are unable to sustain current demand or have excess capacity.
- Mitigating demand growth and curtailing theft through the use of intelligent devices which can detect when too much power is being drawn or dial back on power during peak hours.

- Trimming the cost of on-going operations to protect profit margins, such as by providing mobile technology to all field staff for remote access to scheduling and dispatch applications, maintenance management systems, digital maps, email and other systems.
- Addressing pressing environmental concerns, the threat of terrorist attacks and the potential for natural disasters by analyzing ever-growing amounts of data to update consumption models and understand vulnerabilities.

As a result of these challenges, utilities must adopt real-time, integrated solutions that span and connect the organization to facilitate a broad range of business processes.

Network Management Challenges

Maintaining the applications critical to their charter and full access to the network are key challenges faced by IT departments. Some specific challenges they face include:

- Maintaining high availability to business-critical applications and services, such as IP-based SCADA (Supervisory Control And Data Acquisition) for distributed measurement and control of electric power generation, transmission and distribution, emissions management, mobile asset management, supplier relationship management, CRM, energy trading, market analysis and risk management.
- Expanding the usefulness of the traditional data network with initiatives such as mobile/wireless access to maintenance scheduling and on-line facility repair documentation for use by field technicians, deployment of IP Video to monitor power lines needing repair and for protection against terrorist activities, or converged voice over IP (VoIP) for campus-based employees.
- Baselining, trending, and contracting for cost-effective bandwidth access across all power company facilities. Because power demand is seasonal, traffic engineering needs to ensure existing WAN circuits are capable of transmitting customer billing information, power consumption and transmission data, employee payroll records, and detailed repair documentation regardless of the day of the week or the time of the year.

Meeting this myriad of challenges for energy and power companies requires a single, comprehensive performance management system that can troubleshoot network problems in real-time and provide unprecedented visibility into application activity to shorten mean time to resolution and assure the efficient delivery of applications across the distributed network. In short, they need the *nGenius* Performance Management Solution.

Deployment Guidelines

NetScout's Performance Manager works in combination with strategically deployed monitoring devices and continuous capture appliances to provide a cost-effective approach to managing the performance of key business applications that end users

and customers rely on. The NetScout solutions support the most complex network configurations, including converged and MPLS networks, to deliver comprehensive, real-time network monitoring, application profiling, troubleshooting, capacity planning and user experience assurance capabilities to the network professional.

The flexibility of the NetScout Sniffer and *nGenius* systems enables visibility into the core, distribution and access layers of the network and across both LAN and high-speed WAN environments, including their associated virtual network segments (i.e., VLANs, PVCs and DLCIs). To meet the challenges associated with converged networks, NetScout displays virtual circuits and their associated QoS groups simultaneously, ensuring that data, voice and video applications are properly mapped to the right QoS class and that the network is properly configured to meet business needs. In addition, by utilizing site monitoring capabilities, energy organizations can gain complete visibility into remote locations on the MPLS network from a WAN perspective, providing the much needed application-level visibility for capacity planning and troubleshooting that is commonly masked with MPLS.

In short, NetScout Sniffer and *nGenius* solutions make it easy to maintain consistent real-time analysis and historical reporting of all applications, all conversations, link utilization and all hosts, regardless of the underlying transport technology in order to meet today's tough network performance challenges.

Continuous Data Capture and Troubleshooting Analysis

At particularly critical points in the power company network, those where high concentrations of networked conversations occur, such as application server farms supporting power generation and consumption data, it may be valuable to record a copy of all the traffic. The data may be imperative to rapidly troubleshoot intermittent problems using in-depth, retrospective analysis. NetScout's high-capacity packet recording devices are an effective option here because they retain a continuous copy of the packet stream for post-event troubleshooting and forensic data mining analysis.

Enterprise-class Scalability

Enterprise-class scalability for performance management solutions in energy companies is crucial in three specific areas:

- **Third-party integration.** By integrating the *nGenius* Solution with other industry-leading management and business service solutions often installed in power company networks, such as HP OpenView and IBM Tivoli, performance monitoring capabilities are expanded, enabling better visibility and control over mission-critical networked and application resources.
- **Scalability.** Capable of being deployed in a distributive manner, the *nGenius* Servers work in parallel, rolling up data to a designated master server that provides a complete enterprise-wide view of networked application performance.

- **Disaster recovery.** The *nGenius* Performance Manager Standby Server functions as a co-located backup with a main server to protect against a hardware or database failure. Alternatively, it can be deployed at a remote site for seamless business continuity in the event of a natural disaster.

Advanced Intelligence

NetScout's application services dashboard and early-warning system provides at-a-glance status of application services health and intelligently alerts the network team to impending crises long before users call the help desk in panic or frustration. By identifying application-specific flows across the network and state of services, it provides the information necessary to rapidly diagnose the where, what & why of a problem to more quickly take corrective action. Dynamic and self-learning, it also automatically identifies significant deviations from normal network and application behavioral patterns, including link and application utilization and key performance indicators such as application response time, errors and VoIP degradations, and provides evidence of root cause. By finding problems earlier in the lifecycle, IT Operations can reduce MTTR and decrease the potential for disruption of the business by preserving productivity levels.

Benefits to Power Companies

NetScout's unique top-down, KPI-to-Flow-to-Packet approach enables IT operators to select an event and seamlessly and contextually drill down into application and conversation flow details and, when necessary, directly to the packet sequences. This approach

enables going only as deep as required to diagnose the problem. Power companies can benefit greatly by the comprehensive, real-time and historic monitoring capabilities of the *nGenius* Solution, including:

- **Advanced, early warning of impending problems for proactive, rather than reactive, performance management,** leading to the correction of problems before they actually become problems-let alone reach crisis proportions.
- **Detailed network and application visibility for measuring response time of mission-critical applications,** such as power generation and transmission, user consumption, meter reading services, and monthly customer billing.
- **Proactive alarming, including at the microburst level, on WAN utilization for cost-effective bandwidth planning that reduces network bottlenecks and application degradations.**
- **Access to real-time and historical network performance data from anywhere, via the *nGenius* Solution's web-based access, for rapidly responding to and troubleshooting the root cause of network problems or for more accurate capacity planning.**
- **Automated daily, weekly, monthly and ad hoc reporting of network and application information to executives at headquarters, business managers at data centers and power facilities, and IT staff company-wide.** These customizable reports detail most- and least-utilized segments and applications, top users and conversations and are used for making the most informed decisions on where to invest resources.

Customer Examples:

Some examples of how energy companies use the *nGenius* Solution include:

- A West Coast power company, serving more than 1.5 million customers with 8,200 megawatts of power, was adding a mission-critical power management application to their IP network. They needed visibility into application flows over the distributed network to assure services for distributing power to appropriate markets remained intact. During the rollout, the IT team discovered that a data backup from a remote site had kicked off in the middle of peak demand, causing performance degradations. Once the network managers were alerted to it, they used the *nGenius* Solution to pinpoint the offending application by identifying 'top talkers' and application flows per network segment. They stopped the backup within minutes of discovering it, returning bandwidth availability to the mission-critical power flow application.
- An electric company serving more than 13 million customers in the Western US is pleased with their recent purchase of the *nGenius* Performance Management System and the application-level visibility it provides. In the few months it's been installed, they've been working on identifying all the applications on their network, and this has prompted changes in how they architect their applications. In addition, they have used the *nGenius* Solution to
 - uncover an issue with VoIP QoS settings
 - plan capacity needs for a move
 - discover bottlenecks with the centralized file/print services
 - reveal backups during business hours
- A Midwestern US-based power company depends on their network to deliver on-line repair documentation and instruction to field technicians performing scheduled services to their power plants. Using the *nGenius* Performance Management System, they can ensure application response times so their technicians can minimize the time the power plant is offline.
- One of the largest generation and transmission cooperatives in the US, with power plants, headquarters, control center and field offices geographically distributed throughout multiple states, uses *nGenius* Performance Manager to troubleshoot application degradations. The *nGenius* Solution provides sophisticated application recognition for power company applications from simple e-mail to customized power management, such as DNP3. These capabilities allowed the IT Department to determine bandwidth was not a problem on their links; rather there was an application design issue.



About NetScout Systems

NetScout Systems provides advanced network and application service assurance solutions that deliver complete visibility into real-time, packet/flow-based operational intelligence. IT operators at the world's largest enterprises, government agencies, and service providers use the Sniffer and *nGenius* solutions to troubleshoot service degradations faster and more efficiently in order to reduce MTTR.

Our world-renowned Sniffer and *nGenius* solutions include:

- Intelligent Data Sources for high capacity, deep-packet recording and monitoring
- Analysis Software for real-time and historical network and application performance management, troubleshooting, capacity planning, and reporting
- Advanced Intelligence for early detection and in-depth analysis of complex or specialized application services

Corporate Headquarters

310 Littleton Road
Westford, MA 01886-4105
Phone: 978-614-4000
Toll Free: 888-999-5946
www.netscout.com

European Headquarters

NetScout Systems (UK) Ltd.
100 Pall Mall
London SW1Y 5HP
United Kingdom
Phone: +44 (0)20 7321 5660

Asia/Pacific Headquarters

Room 105, 17F/B, No. 167
TunHwa N. Road
Taipei, Taiwan
Phone: +886 2 2717 1999
www.netscout.cn

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