

WHITE PAPER

Visionael Enterprise Network Transformation

Together Again: The New Voice and Data Network
Effectively Managing Enterprise Network Transformation with
Change Management Solutions

I. Today's Networks: Stressed to the Breaking Point

Since the 1970s, enterprise network technology has routinely undergone a sea change every five to seven years. This innovation cycle has caused companies to consider large-scale changes in their infrastructure, and continues to be the driving force in shaping today's networks. Specifically, as part of their preparations for Year 2000 readiness, organizations across all industries invested heavily in new systems and new infrastructure. This spending began in 1997 and continued through 2000. Now, five to eight years later, that infrastructure is aging, an inevitability accelerated by many companies' embrace of voice over IP (VoIP) technology, which taxes data networks with geometric increases in traffic.

The rapid rise of VoIP does not mark the first time voice and data traffic have traveled together across enterprise networks. In the mid-to-late 1990s, asynchronous transfer mode (ATM) networks were hailed as the enterprise network backbone of the future, carrying both voice and data. While enterprises failed to embrace ATM - with the majority opting for Gigabit Ethernet backbones - the current use of IP and Ethernet, along with traffic-shaping applications such as VoIP and quality of service (QoS) technologies, is propelling enterprises toward combined voice and data networks once again.

Enterprise networks are not prepared for an onslaught of traffic

The advantages of VoIP - immediate cost savings over traditional telephony, and a platform for future voice and video services - are driving many organizations to embrace it, whether their networks are ready or not. In fact, most enterprise networks are not prepared to handle the onslaught of traffic headed their way. The analyst firm Gartner forecasts that nearly 70 percent of the PBX systems deployed in Europe will be IP-enabled or pure IP by 2006.

And VoIP services are just the beginning. Gartner believes that

through 2007, enterprises will be deploying a dizzying array of network technologies in addition to VoIP, such as multiprotocol label switching (MPLS), managed router services, Power Over Ethernet and wireless fidelity (WiFi) networking. In fact, through 2012 Gartner estimates that the number of IT devices used by Fortune 1000 companies will increase by at least a factor of five.

Given the confluence of voice and data technologies that will be loading enterprise networks with unprecedented traffic levels, optimizing their performance has never been a greater imperative. This whitepaper provides an overview of the current state of network innovation as it is being played out in the enterprise market, and explains how Visionael solutions can speed network change while easing its attendant challenges.

II. A Whirlwind of Trends is Driving Network Change

Building combined voice and data networks is a top priority for Global 1000 organizations. Analyst firms such as Gartner spell out the strategic imperative with urgency and clarity: "Build a communications architecture - eliminate disparate voice, messaging and communication systems." Gartner further describes the network of the near future as:

"The next-generation architecture will see a multitude of users or devices directly transported across many networks and communicating directly with applications. The solutions need to be integrated, not operating as separate messaging systems. Enterprises need to examine how they integrate voice, IM, e-mail and conferencing - including audio, video and the Web - into a single architecture that enables users to move seamlessly among the different forms of communication, wherever they may be (such as in the office, at home or on the road)."

Widespread realization of this high-level vision is being driven, beneath the surface, by a confluence of technology, business and regulatory trends, as described in the sections below.

Together, these trends have created a whirlwind of change that is driving organizations of all kinds to overhaul their infrastructure, replacing legacy technology with new networks.

Technology trends: More bandwidth, and more contention for it

Over the past several years, four technology trends have been developing that are today driving the transformation of voice-and-data enterprise networks. The first is the 10 Gigabit Ethernet system, the highest speed of Ethernet operation. This standard was formally ratified by the IEEE in June 2002 and has since been rapidly adopted by enterprises as the backbone technology of choice for high-speed wide area networks (WANs).

The 10 Gigabit Ethernet system operates in full-duplex mode only, over fiber optic media. There are seven media types; in addition to being a core technology for WAN backbones, 10 Gigabit Ethernet also has the flexibility needed to operate in local area networks (LANs), metropolitan area networks (MANs) and regional area networks (RANs). Ten Gigabit Ethernet offers significant cost advantages over other network backbone technologies such as ATM and frame relay, fueling its popularity.

In today's information-centric workplace, Gigabit Ethernet to the desktop has quickly evolved from a luxury to a necessity, and is a second significant enterprise network trend. It has emerged as the network technology of choice for LANs, driven by two factors:

- **Compelling price:** Gigabit Ethernet delivers a tenfold increase in performance for a relatively small incremental cost compared to traditional Ethernet. The 10/100/1000-Mbps Ethernet ports available on high-density LAN switches today allow the network manager to migrate as business and budget dictate higher-speed connections to the desktop.
- **Greater employee productivity:** The increase in speed at the workstation enabled by Gigabit Ethernet allows employees to be vastly more productive. Based on the volume of networked applications used in business today, corporations are spending countless dollars while employees wait for information essential for decision-making. A faster network transfers data faster, and

improves employee efficiency and productivity.

The third major technology trend that has a major impact on the current network environment is voice over IP, which digitizes voice or video signals and sends them as packets through the same network channels as data. Once a consumer novelty in the mid-1990s, enterprise deployments of VoIP technology have steadily grown in their number and scale over the past several years. The adopters' business objective is clear: to reduce costs and enhance revenue opportunities through strategic use of VoIP. It can deliver substantial financial benefits including:

- Reduced infrastructure cost, since data and voice traffic can exist on one infrastructure
- Reduced staffing and management needs from consolidated infrastructures
- Lower corporate telephone bills, as calls are routed through the corporate Internet instead of through external providers.

Although early adoption of VoIP has been driven by cost savings, it is increasingly being chosen by forward-thinking companies as the robust foundation for future applications. These companies intend to leverage VoIP as a means to integrate voice, video and other data applications, illustrated by examples including:

- **Unified messaging,** which ties together voicemail, fax, email and instant messaging systems, enhances user productivity and responsiveness.
- **Mobility applications** that bring together cellular, wireless LAN and VoIP technologies to provide seamless roaming between enterprise and cellular networks.
- **Contact center:** VoIP-based contact center solutions allow distributed call centers to function as a virtual, global resource by running many locations from one centralized set of applications.

A fourth major enterprise networking trend is the widespread use of storage area networks (SANs) and network attached storage (NAS). SANs are a high-speed subnetwork of shared storage

devices, available to all servers on a LAN or WAN. As more storage devices are added to a SAN, they too will be accessible from any server in the larger network. Because stored data does not reside directly on any of a network's servers, server power is utilized for business applications, and network capacity is released to the end user.

NAS is the most mature networked storage solution, and the only type of networked storage that allows data sharing by connected host systems. Originally deployed in data sharing environments, NAS solutions are now widespread in enterprise applications and database environments. In these applications, automated performance tuning and data management capabilities can reduce costs, improve data availability and reduce network contention.

Business trends are fueling enterprise network transformation

Coupled with these technology changes, a number of global business trends are further catalyzing enterprise network transformation, including the merging of voice and data networks. These trends include:

- **Industry consolidation:** Some of the world's largest industries, such as airlines and telecommunications, are in the throes of massive consolidation, driven by economic downturn, mergers and acquisitions. For example, The September 2005 bankruptcies of two major US airlines - Delta and Northwest - are a "reflection of how traditional, hub-and-spoke airlines failed to adapt in the face of aggressive low-cost carriers, falling fares and rising oil prices." News media characterized these airlines as "[c]ount[ing] too heavily on the hope that business conditions would improve and return them to profits - that oil prices would fall, airfares would rise, weaker competitors would fail and low-cost carriers would make mistakes. Instead, low-cost carriers grew, competitors United and US Airways methodically slashed their costs in bankruptcy, and oil prices hit record levels. When Hurricane Katrina shut down New Orleans and sent fuel prices even higher, the cash bleed was too much to withstand."

The impact of such colossal missteps is felt across the airline industry, as remaining players scramble to reduce operating costs and streamline operations as much as possible. IT operations are a prime target; overhauling enterprise networks brings new levels of operational efficiency and employee productivity that are necessary in retaining or strengthening competitive position in tumultuous markets - an axiom in the airline business and any industry in transition.

- **Outsourcing:** Whether the partner chosen is in the US, Europe, India or elsewhere, IT outsourcing is a well-established strategy for reducing IT costs and streamlining operations. Network outsourcing is typically a multiyear contract or relationship in which a service provider builds, manages and operates an enterprise's' public and private networks. Historically, enterprises have kept network management in-house even while outsourcing data center and desktop functions. Increasingly, enterprises are looking for a single source to own the networks and network personnel in a traditional outsourcing model.

Network outsourcing is becoming increasingly prevalent; as businesses are pressured to deploy new technologies like VoIP, SANS and 10 Gigabit Ethernet - while controlling costs - they are looking to outsourcing as a way to launch and manage new services while saving money. It allows the enterprise to focus on its core business and optimize infrastructures for cost reduction and IP migration.

Gartner forecasts that a compelling drive to reduce complexity and cost will cause network outsourcing to be commonplace within two years. The research firm IDC quantifies that sentiment, estimating that more than 50 percent of large enterprises will outsource most or all of their network and network management workloads by 2007.

- **Regulations and compliance:** Over the past several years a vigorous regulatory compliance movement has swept across industries worldwide, driven by Acts such as Sarbanes-Oxley

Act, Basel II and HIPAA. Corporate officers must certify the actual configuration and state of network infrastructure, to attest to the infrastructure's ability to support the business. This requires a close to real-time, extremely granular view of network devices, connections and services. If this information is not accurate, corporate officers may provide false statements and be liable for the consequences.

The common thread: Complete knowledge of the network is required

Across the broad range of today's key technology trends and business drivers, a common requirement emerges: complete knowledge of the network is an absolute necessity. No network can be transformed, nor can any efficiencies be gained, without knowing the exact state of the network.

Today, most organizations try to achieve network knowledge through a combination of manual systems, manual tools and pure luck. A yearly audit of information technology assets is a common approach; fleets of analysts armed with Excel spreadsheets and Visio diagrams swarm over the network over during a period of several weeks, documenting infrastructure, servers, applications, and security appliances. The problem is that as soon as something is written down, it becomes out of date. And, with so much human intervention and lack of consistency, error rates are high. In effect, companies end up spending enormous sums for out-of-date, error-ridden documentation. Such gross inaccuracy is widespread; Gartner estimates that fewer than 30 percent of global enterprises have an automated asset management system in place to track network resources and other IT assets.

III. Visionael Network Resource Manager Simplifies Network Transformation

Visionael Corporation provides a solution set of network change management products and services that can help enterprises through each step of network transformation, reducing the risk of deploying new infrastructure in three ways by:

- Providing an extremely granular, visually presented inventory

of all network assets, which can be updated as dynamically as change occurs on the network.

- Delivering a framework for managing network change that helps ensure success as key applications such as VoIP are piloted and rolled out across the larger enterprise. Visionael solutions allow network professionals to make sure the as-built state of the network reflects the planned state of the network.
- Offering, after network discovery and change, ongoing lifecycle management by continuously auditing the state of the network. This capability is critical as networks are increasingly governed by regulations such as Sarbanes-Oxley, Basel II and HIPAA.

The company's flagship offering, Visionael Network Resource Manager (NRM), ensures the successful planning, roll-out and ongoing maintenance of essential business processes:

- Discover - network assets, including devices, cards, ports and port-to-port connections
- Design - scalable and collaborative graphic design, using logical diagrams and physical schematics depicting equipment layout and connectivity
- Deploy - automate the production of project installation and implementation documents
- Provision - carrier-grade circuit design and assign
- Operate - current, accurate and detailed information needed to effectively maintain business-critical networks and meet Service Level Agreements

Visionael NRM product highlights

Visionael's Network Resource Manager takes the risk out of infrastructure lifecycle management. It offers a host of critical capabilities and benefits including:

- Automated infrastructure data collection: Asset-oriented discovery provides detailed device information, reducing the need for physical audits, while regularly scheduled discoveries and reconciliation maintain up-to-date, accurate information.
- Physical and logical network modeling: NRM provides a

comprehensive central repository of network devices and connections that contains data for all stages of the infrastructure lifecycle, as well as detailed representations of the network in historical, current/as-built, and future views. Its complete physical network design and documentation capabilities include floor plans, rack locations and cabling views for accurate project details.

- Open, scalable and reliable: NRM provides the ability to support networks with thousands of objects, readily handling changes to the entire network as it evolves and grows. Auto-discovery and reconciliation maintains the accuracy of network data over time, and over 20,000 pre-defined objects provide easy access to all major vendors' equipment.
- Flexible and customizable: Open APIs and XML data export facilitate the creation of custom menus, property pages and objects; data import from and export to existing applications assures smooth integration with existing management systems.

Visionael Professional Services provides a strong complement to the value organizations receive by deploying NRM. This team of highly experienced professionals provides technical consulting services that help customers capitalize on the full power of Visionael software and reduce the time to realize return on investment (ROI). Varying in scope and purpose, these services are conducted by Visionael consultants or the company's certified partners. Visionael consultants and partners have extensive experience installing and configuring Visionael products to meet organizations' specific needs.

IV. Network Transformation Snapshot: Outsourcing

Network outsourcers are under tremendous pressure to meet customer expectations - and contractual incentives - early on in their relationship. "Shared risk" relationships are a fixture in the communications and IT outsourcing industry, providing incentives to vendors to deliver services on schedule - and financial penalties if they don't.

This outsourcer, a recognized leader in global, integrated and customized communications infrastructure solutions, recently won a multi-year, worldwide contract with a leading European financial services company valued at more than \$140 million USD. While this business presented a prestigious win, it also entailed ambitious deadlines for service delivery. One of the most challenging was the scheduled launch of global VoIP service in less than six months after project initiation. If the outsourcer failed to meet the deadline with a high-quality VoIP network that delivered \$5 million in monthly cost savings, it would be required to pay the financial services company \$3 million per month until the cost-savings threshold was achieved.

To expedite the design and deployment of the global VoIP network and all other communications services, the outsourcer relied on Visionael Network Resource Manager.

New solutions were required - fast

Visionael NRM played an instrumental role in the outsourcer's winning the European financial services company's business, teaming with the provider to address significant gaps in its current network management tool set and processes. The outsourcer had been using Visio for network design and Microsoft Excel as a makeshift database to store network information. These applications did not share the static information contained within them, causing confusion among the very high number of concurrent users in various locations.

In addition, the outsourcer's existing toolset could not manage the complexity inherent in the European financial services company project. Given the unforgiving timeline associated with the VoIP deployment, it was clear that any design or implementation errors would postpone the migration from switched-circuit PBXes to VoIP and lower the service quality. The outsourcer looked to Visionael NRM to mitigate the risks of assuming the European financial services company's engagement.

Visionael NRM provides a foundation for success

NRM proved itself to be instrumental in allowing the outsourcer to quickly gain a sense of control and productivity in assuming responsibility for the client's network infrastructure. For the outsourcer's teams, the ability to share information, communicate in the same technical language, work from a common database and share a single view of "network reality" from a central repository was essential in meeting the aggressive goals established for rolling out new services, including VoIP, and meeting ongoing SLAs for all services.

Visionael NRM is being relied upon during all phases of the engagement:

- **Design:** The NRM solution speeds the design process by enforcing standards through the use of templates. This improves data consistency and synchronizes all of the engagement's workstreams, thereby reducing the number of potential errors during the customer/ outsourcer transition. Visionael NRM allows hardware and software design activities to occur in parallel, immediately recording all modifications and changes, and making that information instantly available to all participants. Additionally, it automatically generates design documentation, and provides a unique repository for data from all of the financial service provider's worldwide sites.
- **Implementation:** To keep the engagement's various projects on track, Visionael NRM provides workflow management that enables the parallelization of design, ordering, implementation and site facility management, including rack and site facilities, and cabling/patching. The Visionael solution also provides customized and simplified documentation for each project entity.
- **Operations:** As the various network initiatives have come on-line, Visionael NRM has facilitated real-time, automated hand-over of project responsibility to the outsourcer's Operations group. The completeness and integration of all network information has created an extremely accurate logical and physical network inventory, reducing mean time-to-resolution of

network problems by more than 20 percent. Going forward, Visionael NRM keeps a complete inventory of installed equipment, and reports changes or discrepancies between documentation and the live network.

- **Change management:** By providing an accurate, up-to-the-minute view of customers' outsourced networks, Visionael NRM establishes the foundation for efficient change management. It also supports associated work flow and provides a detailed change history.

Next steps: Worldwide capabilities and launch of the VoIP network

With Visionael NRM, the outsourcer has boosted its worldwide offering, enabling it to pursue more global business. Its wide range of capabilities ensure that both legacy equipment and new services such as VoIP and other next-generation technologies can be accommodated with equal ease. Less than a month away from the launch of the European financial services company's VoIP network, the outsourcer is on track to deliver a high-performance communications system that meets the client's cost-savings requirements, making the "shared risk" relationship a win-win for both parties. As a result, the outsourcer's partnership with Visionael Corp. is as strong as the relationship it enjoys with its customer.

V. Summary

Driven by a confluence of technology and business trends, enterprise networks are today in the midst of a period of fundamental change. Now, five to eight years after the last surge in network investment, in preparation for Y2K, companies are overhauling their network infrastructure to carry heavy volumes of voice and data traffic. The switch to VoIP is a main catalyst for network enhancement - although many organizations' networks are not ready to handle mission-critical VoIP applications, as well as MPLS, managed router services, Power Over Ethernet and WiFi networking.

Given the imminent high levels of voice and data traffic that will

be loading enterprise networks, optimizing their performance has never been a greater imperative. Across the broad range of today's key technology trends and business drivers influencing enterprise network development and performance, a common requirement emerges: complete knowledge of the infrastructure is absolutely necessary. No network can be transformed, nor can any efficiencies be gained, without knowing the exact state of the network.

Visionael Corporation provides a solution set of network change management products and services that can help enterprises through each step of network transformation, reducing the risk of deploying new infrastructure in three ways by:

- Providing an extremely granular, visually presented inventory of all network assets, which can be updated as dynamically as change occurs on the network.
- Delivering a framework for managing network change that helps ensure success as key applications such as VoIP are piloted and rolled out across the larger enterprise.
- Offering, after network discovery and change, ongoing lifecycle management by continuously auditing the state of the network.

Visionael Network Resource Manager ensures the successful planning, roll-out and ongoing maintenance of essential business processes. Across the network lifecycle, it addresses five key phases - Discover, Design, Deploy, Provision and Operate - and, in doing so, mitigates the risk inherent in managing today's combined voice and data networks.

About Visionael

Visionael is a software and services company that enables customers to effectively plan for and respond to the ever-changing complexity associated with large computer networks. Enterprises, government organizations, network outsourcers, and telecommunications services providers rely on Visionael tools and insights to know and manage the risks associated with deploying new network technologies and services. The company has an

extensive worldwide customer base, including Alpheus Communications, Comcast, EDS, Kaiser Permanente, IBM Global Services, Sprint and Vodafone. Channel, system integrators and partners include Dimension Data, EDS, IBM Global Services, Logica and Pride. Visionael is a privately held company, headquartered in Mountain View, California, with major development facilities in Tulsa, Okla. and Bangalore, India. Sales offices are located throughout North America and Europe. For more information, please visit <http://www.visionael.com/>, or call +1-650-963-0960.

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