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Assured Optical Networks

Federal agencies face high network costs and a persistent need for those networks to support escalating bandwidth demands and the stringent network performance requirements of new applications.

Widespread deployment of traditional legacy voice and data VPN network services in government networks has resulted in a proliferation of numerous disparate wide area networks (WANs) within federal agencies.

Increasingly, however, agencies are finding tremendous advantages in consolidating voice, data, storage and video networks into a high-performance campus, metro or regional optical network that supports all applications between large agency locations and data centers. Take for example, the Department of Defense's (DoD) Global Information Grid Bandwidth Expansion (GIG-BE). This fiber-optic backbone network now supports the nation's military operations worldwide, providing a unified foundation for the DoD's network-centric computing goals.

Most federal agencies now understand managing numerous networks is inefficient, expensive and hinders the rollout of applications such as data replication for continuity of operations/disaster recovery, Voice over Internet Protocol (VoIP), service-oriented architectures (Web services) or advanced video services. More importantly, agencies realize networks must be 'assured' to withstand all possible threats. To enhance security, realize cost savings and enable agencies to easily and swiftly add applications and services, there is a strong need for networks consolidated into a single communications infrastructure.

While agencies could choose VPN data networks with shared network facilities, for example, "they are often better off with an optical network solution where the only performance constraint is the speed of light," said Jim Archuleta, senior manager of government marketing for Ciena Government Solutions.

If federal agencies continue adding bandwidth incrementally and prioritizing traffic during peak periods of demand, their applications will increasingly struggle while competing for congested WAN resources. This approach may have worked when bandwidth needs were growing at a moderate pace, Archuleta explains, but a more proactive plan is needed to address today's dramatically increasing traffic growth.

Using multiservice optical connectivity, any federal organization can consolidate multiple lower-speed services or protocols over a converged optical network topology. Optical networking solutions are available as standalone networks owned and operated by agencies or their systems integrators, or from service providers as private networks implemented under a managed services offering.

Optical networks provide bandwidth for even the most demanding applications. Using dense wavelength division multiplexing (DWDM) in metropolitan networks, for example, up to 40 protected 10 Gbps channels can fit on a single pair of optical fiber, Archuleta explained. As demands for data replication, ERP applications, VoIP and LAN extension continue to grow, service connectivity requirements of 1 Gbps or more are becoming increasingly common. Several federal agencies have observed aggregate bandwidth demands exceeding 10 Gbps, driving the need for a new approach to networking among primary locations.

Meanwhile, because consolidated optical networks enable agencies to both control and isolate traffic on a private network, this alternative creates a highly available and inherently more secure network environment.

Over the past few years, the cost of optical network technologies has plummeted – an estimated 95% per bit, say industry observers. At the same time, optical network management capabilities have improved and offer more automated functionality, making these networks easier to implement and

> The DoD's GIG-BE and DoE's optical network for cyber-scientific research, "attest to Ciena's leadership in advanced optical networking."
>
> **– Rob Rice**
> **vice president and managing director of Ciena Government Solutions, Inc.**

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use. Use of optical networking enables application traffic to be handled transparently, minimizing the need for application tuning, network tuning or packet inspection to manage congestion and prioritization.

How Ciena Stands Apart

Ciena's Adaptive WAN solutions enable the consolidation of disparate, legacy networks into a unified, multiservice optical network that optimizes operational efficiency and delivers cost savings, while meeting the growing bandwidth requirements of emerging applications. Ciena's product portfolio is comprised of next-generation, multifunction platforms that flexibly support any mix of Ethernet, TDM, SONET, WDM, video and storage interfaces to streamline existing networks.

Ciena provides a suite of products for consolidating multiple networks, including WDM, Multiservice Provisioning Platforms (MSPP), and optical Ethernet and storage/LAN extension solutions. The benefits of Ciena's Adaptive WAN solutions include:

• Unprecedented flexibility with software-configurable ports that allow any service on any port to lower total cost-of-ownership, simplify planning efforts, and reduce sparing costs;

• A future-proof investment, with the scalability and flexibility to rapidly support changing network requirements and traffic growth over time;

• Simplified and automated design, configuration and management with point-and-click provisioning to save time, effort and manpower;

• Assured operations, via carrier-class platforms designed for resiliency and enabling highest network availability and secure operations to meet the operating requirements of critical infrastructure.

Today, Ciena's solutions are widely deployed in several government agencies including the Department of Energy (DoE), the DoD and civilian agencies. Perhaps the most significant example of Ciena's success in the government market is its role as the foundation for the DoD's GIG-BE fiber-optic backbone network. Ciena's CoreStream™ Agility optical transport and switching platform enhances DISA's GIG-BE optical IP terrestrial network in support of voice, data, video and transport services among more than 100 key locations worldwide. The integration of Ciena's optical networking solutions satisfies the DoD's need to significantly expand available bandwidth and streamline the delivery of converged services on an automated, reconfigurable optical network.

Ciena's CoreStream Agility and CoreDirector® platforms are also deployed within the DoE's flagship research network, the UltraScience Net (USN). These platforms support fast, dynamic provisioning and optimized bandwidth management for collaborative research projects.

"By providing the DoE with virtually unlimited on-demand bandwidth for cyber-scientific research, this deployment attests to Ciena's leadership in advanced optical networking, including platform flexibility, dynamic reconfigurability and automated management," said Rob Rice, vice president and managing director of Ciena Government Solutions, Inc.

Ciena's optical networking platforms support applications vital to critical agency operations, including surveillance and reconnaissance, and control
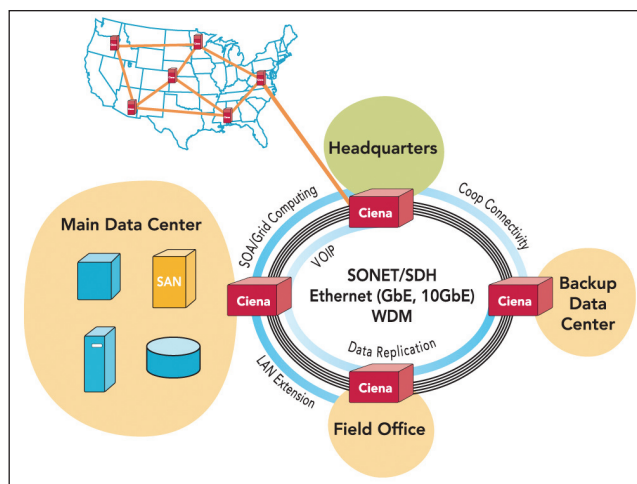
information-sharing by providing assured connectivity for strategic operations. They also provide a foundation for support of initiatives such as distributed computing and data center resource consolidation.

Perhaps this is why so many federal entities, including the Army, DoE, civilian agencies and others have turned to Ciena for optical networking solutions. Ciena's Adaptive WAN solution is field-proven in the most demanding production networks – carrying mission-critical traffic with a variety of bandwidth services (e.g., SONET/SDH, DS3, GbE, 10GbE, DWDM). The company's optical networking technologies offer a secure, resilient, scalable network alternative to exploit the applications driving federal operations now and in the future.

Visit www.ciena.com/gov now to download the Yankee Group white paper, "Adaptive Network Architectures Are Critical to Government IT Evolution." For more information, see GSA Schedule #GS-35F-0316S. You can also contact Jim Archuleta at jarchule@ciena.com or 410-981-7340.

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