Fiberutilities Group Keeps Tabs on Statewide Networks with MRV

Overview

In 2007, the nation found itself in the grip of late-season storms that resulted in unseasonably severe cold weather. Concentrated in the Midwest, the cold snap caused ice storms in numerous areas throughout the region. Among the areas hardest hit was the state of Iowa, in which 20 communities lost power. The impact of these storms on statewide networks was extreme, presenting a huge network management challenge for Fiberutilities Group (FG). The Cedar Rapids, IA, based company builds private networks that are owned by its telecommunications and enterprise customers. Many of them also turn to FG to manage these networks. With the extreme weather causing major power outages, FG technicians were busy keeping an eye on back up power and networking equipment. Without an out-of-band network management system, the company would have been in the dark as to how to prioritize its resources to maximize uptime. That's where its MRV-based out-of-band network helped the company to shine with its customers.

An out-of-band network provides access to IT and telecommunications devices as well as power and physical infrastructure resources, maximizing system up time while reducing capital equipment and personnel costs. Remote management of these resources is accomplished by standard Ethernet TCP/IP communications, in addition to serial and modem connectivity providing always available access from any location even during network outages.

Background

Fiberutilities Group is a specialist in private networking solutions that helps clients evaluate, deploy, and migrate from existing carrier circuits to privately owned optical backbone networks. The group plans, builds, and operates client-owned networks, providing an optimal balance of network management from FG paired with complete client ownership and network visibility.

Fiberutilities Group provides a unique set of planning, building, and operations services to its clients. It is not affiliated with any vendor or carrier or committed to any particular technology. Because the group is vendor-neutral and designed its service sets in a modular manner, it can tailor solutions to the specific needs of each client—right down to scaling its level of involvement. Thus, despite the fact that FG specializes in complete network solutions from conception to execution, many of its services are available to clients "a la carte."

The uniqueness of the FG business model lies in its ability to offer clients as much or as little service as they need. The cafeteria-style approach to network architecture, implementation, and management gives FG more flexibility than a traditional carrier-based network option but more extensive implementation ability than a consultant group.

Challenges

Manage Large, Dispersed Networks
The Fiberutilities Group has the ability to build and maintain nationwide networks having already built networks totaling 3,500 miles of dark fiber. When its first major client signed on, FG needed to find the most effective way to manage a widely distributed network. This meant having visibility into numerous remote locations scattered throughout the region and across the country. With long distances between locations, truck rolls were often not a realistic option, so FG needed the ability to track and monitor every location from its central office.

Offer Visibility to Customers
Not only did FG need to have complete visibility of its own networks as well as its customers' networks, it needed a mechanism to give customers full visibility into their own networks. FG wanted its customers to benefit from the same remote monitoring capabilities and features it used in its network.

Maintain Maximum Uptime
Uptime is very important to Fiberutilities Group customers, in fact it's one of the biggest reasons FG is trusted with network management responsibilities. The company's management solution needed to allow technicians to respond to equipment and environmental issues quickly.

Common Interface to Manage Diverse Communications Equipment
The type of devices installed in each customer location varies widely and finding a common management system to monitor

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and control switches, routers, firewalls, telephony devices, servers, backup systems, storage and other equipment is important to reduce complexity. Finding a common dominator to provide access to all devices is a key factor in enabling FG's support staff to access equipment quickly and efficiently.

Monitor Physical Elements in Remote Locations
Because of the large scale and dispersed nature of its networks, FG needed a mechanism for monitoring non-networking equipment like generators, cabinet doors, battery plants and security cameras.

Maximum Security
Providing remote management access provides great flexibility but with that flexibility comes the always present danger of securing access to critical system information. Ensuring that proper credentials are enforced as well as encrypting sensitive password and user information properly is imperative.

Although the Fiberutilities Group is not a service provider, it needs a carrier-class infrastructure. Numerous FG employees had previously worked for carriers, laying an estimated 10,000+ route miles of fiber in four states and 70 different network locations. With this experience, the group had a solid grasp of the hardware it needs to provide the appropriate network services for its customers.

MRV Solution: LX Series Console Servers and Sensor Managers

The Fiberutilities Group chose an MRV out-of-band networking solution based on the company's LX Series console server and sensor management platforms.

Out-of-band management differs from its traditional in-band counterpart. A separate network is maintained exclusively for management and control data, completely independent of the network over which data is being sent. This architecture provides Fiberutilities Group the ability to have an alternate route to systems and devices in the event of an in-band network failure.

The LX Series 4000T console server provides the foundations on which all FG management services and capabilities are built. The LX 4000T provides secure access to the serial interfaces of switches, routers, servers, firewalls, and other communications equipment via a single IP address. Connectivity to the LX 4000T is available via dual Ethernet 10/100 interfaces, serial connection, and\or v.92 modem. The LX Series Console Server also provides sensor and alarm monitoring providing visibility into elements that affect network operations.

Additionally, the MRV solution enables FG to monitor and connect to management devices at remote sites throughout its widespread network. With MRV's LX Series Console Server and its built-in Trigger and Action capabilities, FG can now maintain constant contact with its remote locations, automatically keeping vigilance over both the physical grounds, the status of its network equipment, and its operating environment.
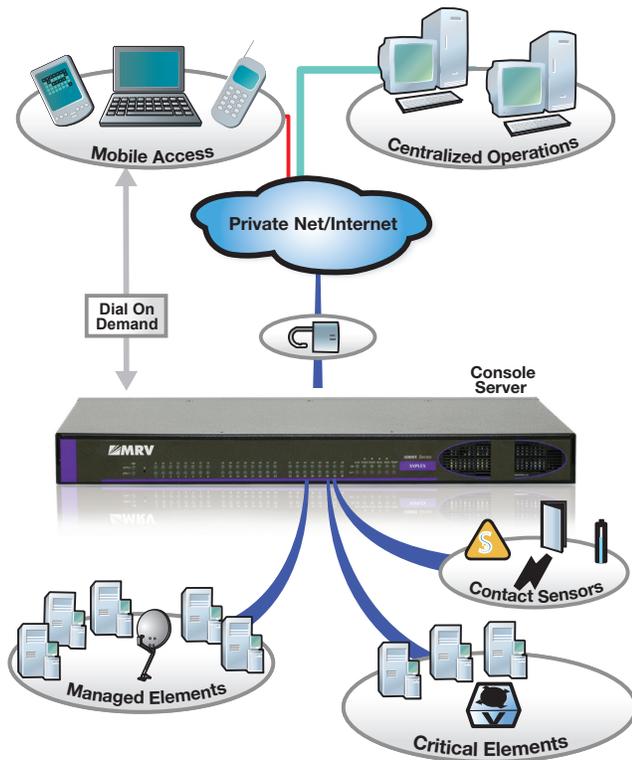
Triggers can be configured to monitor a variety of conditions in the physical environment, and react when any element changes state or surpasses a threshold preset by network administrators. Based on the triggering event the platform automatically responds with an action to ensure the functionality of network equipment and seamlessly maintains connectivity. Actions can include enabling redundant equipment, sending a notification via page or email, starting a log file, enabling a security camera, and\or powering down equipment with no user intervention.

FG also utilizes MRV's sensor and alarm management platform, the LX 7204T. This expansion device is managed and controlled via the LX 4000T and supports an array of sensors that can monitor wet/dry contacts as well as 20ma analog loop sensors. A control output module allows the LX to enable devices using external relays or contacts to enable additional lighting, audible/visual alarms and devices such as generators and pumps.

What is Out-of-Band Networking?

- Out-of-Band Networking provides a centralized access point for operational and physical infrastructure control

- Operational control provides connectivity to access equipment for remote diagnosis, an alternate path to respond to network failures, and power management.

- Physical infrastructure control automates a variety of environmental monitoring, including temperature, humidity, physical security, and disaster recovery

- Access to managed equipment can occur over Ethernet, or several modem choices, including GSM/GPRS wireless support.

- Out-of-Band Networks can nearly eliminate the need for administrative personnel to be physically present at a managed device, and personnel can be minimized and centralized, resulting in significant cost savings.

- Administrators connect to console servers from any location with network access (office, home, while traveling)

- Authentication, logging and many other options assure security.

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network manager can monitor all communications devices, environmental status, and power status from a single management interface from any remote location.

With its remote locations scattered throughout multiple regions of the country, FG must respond to widely varying environments, from very hot and humid conditions to ice storms like those of 2007. Temperature, moisture, and other physical environment-monitoring sensors not only alert network administrators to adverse changes but can automatically trigger back-up systems to respond at the same time. The versatility of the LX 4000T platform also allows FG to control IP cameras, providing 24/7 physical visibility into all sites within their network.

Success!

With a business that combines all the carrier-class infrastructure of a service provider with the flexibility to offer each customer a unique and customized private network, the Fiberutilities Group needed a complete and reliable management approach. Its unique service model also required that any solution be flexible enough to give complete visibility into all aspects of network management to deliver uninterrupted connectivity—even in the event of an intense ice storm. The out-of-band networking solution from MRV gave the Fiberutilities Group the ability to keep its customers' productivity from being frozen by a network outage.

Why MRV?

The Fiberutilities Group looked at a number of options for a reliable system that would enable it to cost effectively provide the complete set of network services they offered. MRV proved to offer the most integrated solution on the market—a combination that provided FG significant savings by reducing operating expenses for maintenance tasks.

A unique feature that FG found attractive about MRV's solution is its approach to power monitoring and control in the out-of-band network. An integrated digital DC voltmeter (DVM) has recently been introduced in MRV's console servers. It allows network personnel to instantaneously monitor DC line status as well as the amount of power being consumed by any rack of equipment in any location. With this DVM support, a

MRV has more than 50 offices throughout the world. Addresses, phone numbers and fax numbers are listed at www.mrv.com. Please e-mail us at **sales@mrv.com** or call us for assistance.

sales@mrv.com