

Making satellite networks stronger

Network downtime is expensive and all the more frustrating when at remote sites. MARK PIENING extols the virtues of secure remote management



Best Ezedibia, an engineer for UnoTelos, next to a stabilised satellite antenna

As all corners of the globe become increasingly connected, expectations rise for the functionality delivered by these links, no matter how remote the location. Broadband satellite access is the delivery method, especially for operations in the oil, gas and mining industries which conduct operations in some of the most distant areas and hostile conditions imaginable. With any service, as it becomes more established, requests for new functionality become coupled with a call for reduced costs.

A variety of satellite systems serve the energy industry today, each with multiple vendors,

devices, strengths and weaknesses. At a base level, they all provide the same thing – connectivity. They transfer packets of information from one location through a teleport up to a satellite and back down to a dish. These packets might contain operations information like drilling data, weather reports, and email, or information important to the welfare of a crew working long hours far from home like voice over IP (VoIP) phone conversations and on-demand movies.

Maintaining high availability of critical satellite networks at remote locations presents a number of unique management challenges for

operational and IT staff. Communications are often disrupted due to environmental interference which can require a dispatch of a service technician to the remote site to re-establish connectivity.

Likewise, routine network maintenance such as re-provisioning an antenna controller or upgrading a router's operating system with the latest security patch often necessitates a costly on-site visit. Addressing a satellite network outage on an isolated oil platform in the Niger Delta of Nigeria, for example, can be a very expensive, difficult, and time-consuming challenge for any IT staff.

Secure remote management

Existing network monitoring tools fall short of meeting these challenges because they only work in-band, or when the network is up, and lack the automated capabilities to correct problems without manual intervention. IT staff have been left to manage with tools designed for centralized, terrestrial-based networks that are not able to respond to the unique challenges of satellite-based communications.

To counter these issues, satellite providers are implementing secure remote management (SRM), a remote management platform for network devices at remote locations. SRM integrates the intelligence of an IT administrator with a direct connection to managed devices to automate identification, isolation and resolution of faults. An SRM appliance uses a modem to dial out to a low-earth orbit (LEO) satellite to establish a secure, out-of-band connection with the NOC, augmenting traditional M&C tools with the information they need to function and giving the NOC access to remote devices even if the main satellite link is down.

The hazards of working in the isolated

locations of oil, gas and mining are easy to understand. The most obvious hurdle to quick IT “truck rolls” for network repair is just getting to these locations. Frequently, it’s not even a truck. Recently, multiple helicopters have crashed while transporting crew members to platforms at sea demonstrating the challenge of just getting there. Even in locations connected by roads, facilities are separated by great distances, ensuring that downtime is prolonged.

Nigerian infrastructure

An example of the importance of managing remote network infrastructure is in Nigeria. As Africa’s largest producer of petroleum, Nigeria faces multiple challenges to terrestrial infrastructure connecting production facilities across the vast Niger Delta locations. Remote locations as well as ongoing civil unpredictability around the energy industry means that site visits for network repairs and troubleshooting can be costly, time consuming and potentially dangerous.

UnoTelos, a multi-systems integration company has introduced secure remote management solutions into western Africa that



Mark Piening,
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reduce the need for on-site repairs through automation and increased visibility into problems at remote sites.

“Within the oil and gas industry, there are always sites in remote locations with critical IT infrastructure, but with no local IT support,” says Jude Egbokwu, CEO of UnoTelos. “In the event of a problem, the high cost and security concern of sending support staff to these locations either by road or helicopter makes secure remote management effective and also dramatically improves operational efficiency. As our customers expand their use of satellite systems for remote broadband access, they need a secure remote management solution to meet their operational needs.”

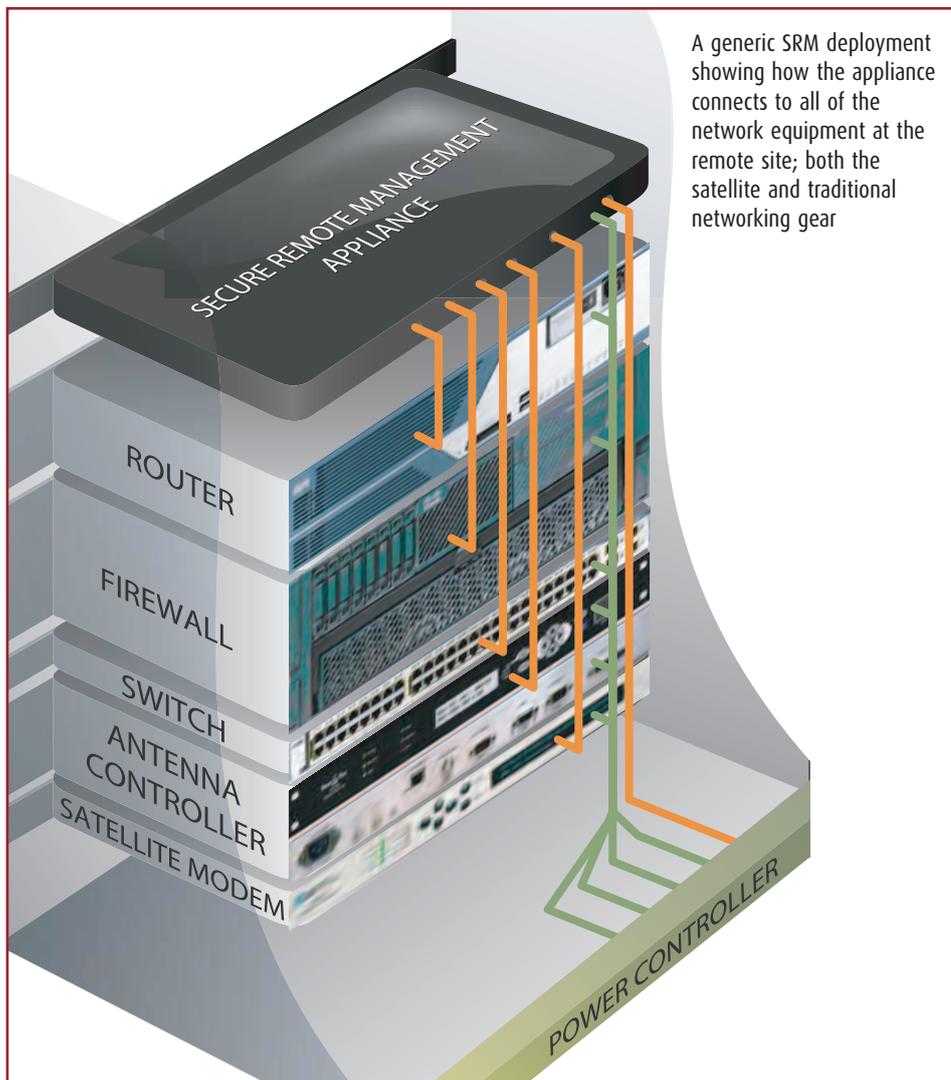
In addition to the energy industry, UnoTelos has had success supporting the expanding communications needs of Nigeria.

“The last decade has seen a massive expansion of IT infrastructure across Nigeria and the challenge for many organizations is to reduce support costs and increase reliability,” said Egbokwu.

Oilfield services provider deploys SRM globally

Global Connectivity Services of Schlumberger is responsible for providing secure, reliable communications for oil and gas customers with locations around the world, including satellite-based telephony, global maritime distress and safety systems, maritime communications and entertainment and crew services across most of Africa.

Schlumberger deployed SRM to automatically detect, diagnose and resolve network-related faults and improve end-to-end



communications from global teleports to customers' remote locations.

By leveraging out-of-band capabilities, SRM appliances are always able to manage Schlumberger's network even when the main satellite broadband link is down or degraded. Since the appliance is connected to all devices under management, it continues to monitor and control connected devices in the case of an outage. The appliance will automatically establish an alternate management connection via integration with an external modem to a LEO satellite in order to send important monitoring, logging, and audit data back to the NOC for Schlumberger's staff to see and use.

SRM has helped Schlumberger greatly improve both the quality and availability of service they provide their customers by enabling them to more quickly and correctly triage support events and remotely resolve critical service problems. The SRM appliances ensure that a secure communications path is always available between the site under management and Schlumberger's NOC, and that Schlumberger's staff has constant access and visibility with up-to-the-minute performance statistics from all networked sites under management.

Before deploying SRM, when communications went off-line due to an outage or service disruption, the electrical or barge engineer onboard an offshore platform was conscripted to become the eyes and ears of the Schlumberger engineers back at the NOC to troubleshoot the problem. If the problem could not be solved due to the lack of local technical expertise, language barriers, or personnel availability on the rig, a support technician would be dispatched to solve the problem. The Mean Time to Recovery (MTTR) could therefore take many hours or even days, depending on the site's location and availability of technical expertise.

Satellite communications are subject to frequent service disruptions caused by interference due to bad weather. To restore service, Schlumberger's operational staff often has to reconfigure and re-provision devices, such as satellites, antenna controllers and other communications equipment. This manual



The Chevron Agbami is a floating production, storage and offloading (FPSO) vessel stationed in Nigeria

WHY THE OIL, GAS & MINING ICT IMPERATIVE MEANS "WIRELESS, SATELLITE AND EVERYTHING IN BETWEEN"

Increasingly, upstream and downstream company operations across many of the various industry segments of the oil & gas, and mining, industries are dependent upon both fixed and mobile broadband links, services, technology solutions and the manifold complex applications they are used to support. The extractive industries have become increasingly dependent on the creation of an ICT that comprises stand-alone satellite-based solutions, satellite-terrestrial hybrid solutions, and some stand-alone terrestrial technologies, including fibre.

In the oil & gas environment, in particular, operational success is dependent on access to the most efficient ICTs, and to a vast array of sophisticated applications that these technologies bring to the disposal of teams of geologists, geophysicists, drilling engineers, seismic data analysts, and a wealth of other upstream expertise.

Be it, for example, production data management, remote surveillance, or modelling solutions, all integrated into an inclusive web-based visualisation framework, these various constituent elements of the digital oilfield (and gas field) depend on the satellite, and satellite-hybrid, communications environment to provide connectivity, bandwidth, reliability and cost-effectiveness.

Or, be it a wireless broadband service for offshore and remote oil & gas drilling rigs and production platforms that permits offshore workers to communicate with their homes and friends more easily using wireless enabled laptop computers and PDAs. This uses the very same type of satellite links used as the backbone of oil, gas and mining digital comms infrastructure everywhere, but which is

dedicated to the welfare of production crews who often work in harsh, extreme and remote locations. It's also in the interest of companies interested in maintaining high levels of crew retention.

Current global economic conditions are creating pressures that continue to intensify energy sector demand for broadband-driven operational efficiencies. As pressure is exerted on oil prices, the oil & gas industry is striving to optimise its investments in terrestrial wireless, satellite and fibre-based broadband communications platforms to increase efficiencies in exploration, drilling and production.

Precisely how energy sector executives are currently applying state-of-the-art broadband solutions to increase the profitability of their businesses is the primary focus of the GVF 4th Annual Oil & Gas Communications MENA Conference, which will deliver extended networking opportunities between end-user and vendor expert practitioners, and fostering a dialogue which will detail the applications and communications imperatives of the energy market vertical.

Well-managed ICT networks can play a big role in reducing drilling, production, and exploration expenditures and in every other area of operations. Oil and gas companies can work with communications system integrators, turnkey service solution providers, third-party suppliers, and governments to work towards achieving that objective.

Martin Jarrold is chief of international programme development, GVF

process can be both time-consuming and occasionally error-prone.

SRM automates this routine maintenance by applying best-practice procedures provided by the device manufacturer. The automated capabilities have helped provide Schlumberger staff with a secure, consistent and repeatable approach to remotely perform these routine maintenance tasks error-free with minimal manual intervention required.

SRM for the future

Proper functioning of both satellite and traditional networking gear at a remote site is critical to avoiding downtime and maintaining the link to the outside world. These networks have all the challenges of your basic office network like configuration changes, optimization and hung device states, as well as the effects of

the rugged environments they serve such as power failures, non-stationary facilities, and a lack of onsite dedicated IT staff. Until recently, the result has been downtime and expensive site visits for what are often basic repairs of networking devices.

It's hard to envision a decrease in the need for connectivity in the future at the remote operations common in oil, gas and mining. Satellite connections are becoming more robust and affordable, with increasing competition for coverage areas and decreasing costs of satellite network components. One thing that remains the same is that all remote connectivity options rely on equipment at the edge, which brings the opportunity for downtime caused by device errors. Short of the unrealistic deployment of an army of onsite technicians, management of these satellite-linked sites will continue to benefit from secure remote management. ■