Oil and Gas: Transforming the Economics of Networking

Juniper helps oil and gas companies optimize costs, improve security, and reduce complexity while achieving 99.999% reliability

Challenge

Business units (BUs) across upstream, midstream, and downstream in the oil and gas industry require enhanced agility to "select" network services critical to their business, while adhering to corporate governance for increased security and reliability.

Solution

Juniper provides a service provider-like blueprint for oil and gas networks to move packets quickly and reliably, while providing cybersecurity at the packet level, arresting attacks early in the "kill chain," and protecting mission-critical assets.

Benefits

- Lower operating costs through automated provisioning and governance workflows
- Improved cybersecurity with centralized monitoring
- Automated policy control and implementation
- Seamless data center aggregation

Technology innovation coupled with optimization driven by the volatility of oil prices, increased demand for new services by business units (BUs), and growing cybersecurity threats are having a profound effect on the way oil and gas networks need to operate. These dynamics will require a modernized, highly available, service provider quality interconnect to all oil and gas facilities to support and enhance the business intelligence of the corporation, allowing the network infrastructure to reduce costs, increase security, and improve agility.

The Challenge

Oil and gas (O&G) companies face a number of challenges today, from seamlessly meeting the demands of each business unit (BU) to improving the "intelligence" of their operations technology (OT) infrastructures to maximize efficiency and avoid production loss. O&G companies must also accommodate new technologies, including IP-enabled supervisory control and data acquisition (SCADA) and distributed control systems, the increase of sensors for better analytics, and mobile applications. In addition, increasingly sophisticated cyberthreats to mission-critical OT infrastructures are intensifying with IP packet network adoption. Addressing these challenges demands a network modernization strategy that also transforms the economics of networking.

The Juniper Networks Oil and Gas Solution

Juniper partners with a number of O&G companies to transform networks, not only to help them meet today's challenges but also to support future requirements by addressing common management goals. These include:

- Reducing operational expenditures and simplifying governance complexity
- Achieving 99.999% uptime for core and critical applications
- Enabling the transition, deployment, and automation of new and existing services

Juniper Networks® MetaFabric™ architecture provides the holistic blueprint for building intelligent networks in the data center, network operations center (NOC), campus and branch, and field area networks, providing a secure, scalable, and automated underlying networking platform for next-generation applications to improve production and well-recovery rates, distributed control systems, big data analytics, high-performance computing, and other mission-critical applications. MetaFabric architecture provides a flexible foundation to include "as needed" software-defined networking, network automation and control, and virtual functionality to optimize economic transformation.

Features and Benefits

- A modernized architecture that supports diverse technologies and operational functions with a single, converged network that is inherently protocol-independent, highly reliable, secure, and provides design flexibility to extend IP/MPLS natively from the core to the field area network
- Ethernet VPNs (EVPNs) over MPLS that seamlessly aggregate multiple data center sites and network operations centers to converge IT and OT repositories to accelerate business intelligence

- A robust MPLS core to support existing industrial control communications and enable a centralized, carrier-class cybersecurity strategy at the data center and NOC to reduce governance complexity, while enabling zero touch provisioning (ZTP) capabilities at the network edge
- A fully integrated system that can be automated to commission, test, and validate new data centers and ease moves, adds, and changes through a web-based, one-touch dashboard

Solution Components

- **Converged Core**: Service provider-grade IP/MPLS core network to transport business and mission-critical traffic reliably over a single converged network— the foundation for a successful transformation to a single, ubiquitous network.

- **Data Center Aggregation**: NOCs and data centers represent centers of excellence that require intelligent networks to seamlessly unify service creation, delivery, and support, with the necessary built-in scale to support the future applications that leverage convergence of IT and OT intelligence to increase business intelligence. EVPN delivers a wide range of benefits for geographically dispersed centers of excellence—including greater network efficiency, reliability, scalability, VM mobility, and policy control—that directly impact the bottom line of power utility providers.

- **Cybersecurity**: Integration of geographically distributed assets through centralized control that improves agility when responding to supply and demand fluctuations, reduces operational costs, and enables previously unachievable process efficiencies. A systematic approach to security begins by reducing the vulnerable surface of the industrial control system network. Carrier-class systems include redundant hardware, in-service software upgrades, line-rate performance, and wire-speed security.

- **Process Control and Monitoring**: Circuit-to-packet emulation over service provider-grade MPLS preserves the inherent security of serial time-division multiplexing (TDM) communications common to industrial networks, as well as supports a centralized cybersecurity strategy and a paced migration of industrial control systems to IP. Each SCADA device transmits or receives signals that can be copied to many different locations and alarms, and control information can be sent to multiple sites. Video surveillance can also be directed to multiple sites, saving bandwidth by copying packets closer to the destination.

- **Field Area Network Service Extension**: Juniper's Network Functions Virtualization (NFV) strategy provides the necessary service aggregation and extension to customers. Additionally, NFV platforms offer zero touch provisioning to reduce deployment and operational costs. These extended services include on-demand service delivery to meet the accelerated demand of BUs.

- **Network Automation**: Juniper Networks Junos® operating system software automation features, developed over the past 15 years, enable Juniper to deliver new features and more than 37,000 XML Remote Procedure Calls in core Junos OS and Network Configuration Protocol (NETCONF) to provide network-based system access. Juniper has identified approximately 24 of the most common network tasks that can be automated.

Summary—Juniper Solutions are Transforming Today's Oil and Gas Network Modernization Challenges and Addressing Future Requirements

Juniper understands the networking requirements of the O&G industry, and it collaborates closely with customers to optimize the value its proven products and integrated solutions bring to the energy market through the MetaFabric architecture. With a mandate to reduce operating costs, improve agility, and ensure reliability, Juniper and its partners are committed to meeting the evolving needs of the dynamic O&G landscape.

Next Steps

For additional information on how Juniper Networks can support your power utility network modernization initiatives or learn more about the technology, please contact your local Juniper sales representative or visit http://www.juniper.net/us/en/solutions/.

About Juniper Networks

Juniper Networks challenges the status quo with products, solutions and services that transform the economics of networking. Our team co-innovates with customers and partners to deliver automated, scalable and secure networks with agility, performance and value. Additional information can be found at Juniper Networks or connect with Juniper on Twitter and Facebook.

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