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XTran: fuelling the Oil and Gas industry

XTran: MPLS for Operational Telecom made easy

- Tailored for industrial applications
- Intuitive and simple
- Reliable operations in harsh environments

“Many of the world’s leading oil and gas companies have chosen OTN Systems as the supplier of their operational telecommunications network.

Decisive factors in their choice are the product’s high reliability, operational simplicity and versatility. OTN Systems’ network solutions guarantee maximum uptime at a low operational cost.”

Mission-critical networks for the Oil and Gas industry

OTN Systems develops fiber optic networking products, specifically designed for the operational telecom department of oil and gas companies, which are often deployed in dangerous, harsh and remote environments. Hence it is of paramount importance that this infrastructure remains in operation round-the-clock to guarantee revenues. Furthermore, this infrastructure needs to be protected against vandalism, sabotage and even terrorist attacks.

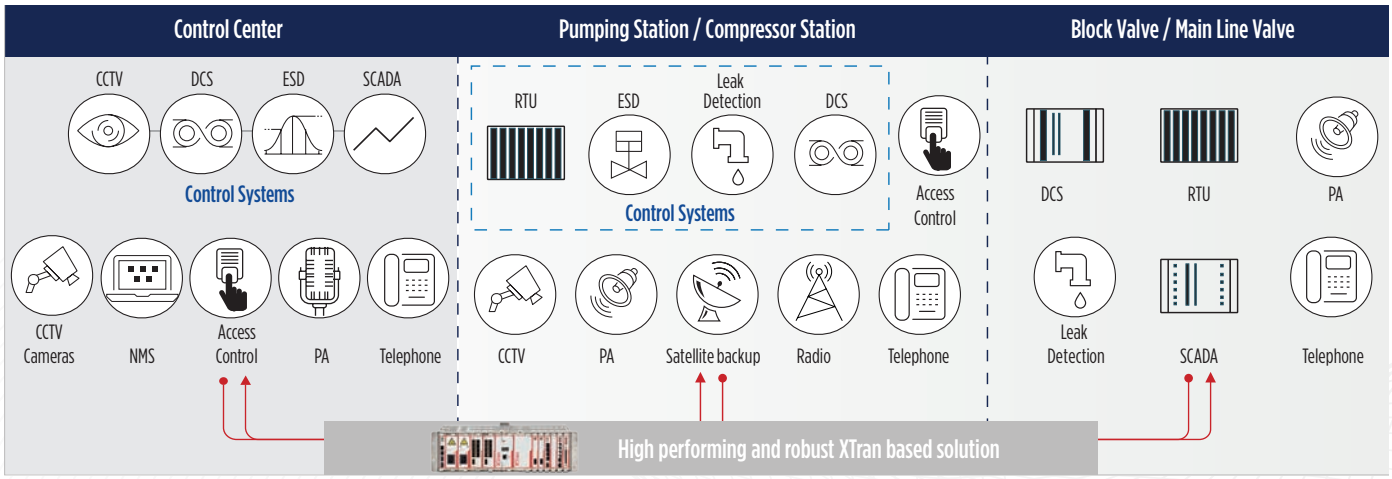
In order to keep production going and to provide full protection, a secure and reliable communication system is vital. The number of telecom vendors with hands-on experience in the sector is rather limited. OTN Systems is one of them since 30 years.

In search of the right network solution

Telecommunication needs encountered in the oil and gas industry differ to a great extent from carrier or enterprise requirements. Carriers want to sell telecom services, while optimizing business processes is key in the enterprise world. Oil and gas companies have a different challenge as they need to make sure that their production is up and running at all times while optimizing their capital and operational expenditures. A reliable telecommunication network is an important building block to achieve this.

OTN Systems introduced the OTN (Open Transport Network) product line during the early nineties. It very quickly reached the No1 position in the oil and gas market as it was the only solution available on the market that exactly matched the needs of this industry. More than 20 years later, the company introduced its successor product, called XTran. While OTN was SDH/SONET based, the dominant transmission technologies until the turn of the century, XTran applies the latest standard for packet transmission in an industrial environment: MPLS-TP.

MPLS-TP (Multiprotocol Label Switching – Transport Profile) uses the main functionalities of MPLS but comes with extra features to support mission critical transport of information. The standard was drafted in cooperation between the ITU-T (International Telecommunication Union) and the IETF (Internet Engineering Task Force). MPLS-TP is considered as the natural successor of SDH/SONET as it offers identical features such as sub 50ms reconfiguration times, symmetrical data paths, flexible network topologies, etc. OTN Systems added extra functionality to its MPLS-TP implementation making XTran the perfect operational network for the oil and gas industry.



Reliability providing ease of mind

Refineries and pipelines need to be up and running round-the-clock. An hour of downtime can cost millions of dollars. As mission-critical applications are transported by the telecommunication network, its availability is key.

Therefore, OTN Systems develops communication networks which are 'rock solid' and use multiple levels of **redundancy** to guarantee an extreme level of availability 24/7. Cable breaks or power failures have no impact on the services. Users can opt to have control cards, interface modules, individual circuits or power supplies duplicated.

Special efforts have been put into the design to cope with extreme **environmental conditions**. OTN Systems' XTran can be installed in outdoor cabinets or underground shelters. Most models have a fanless design and will withstand harsh environments while power consumption is kept to an absolute minimum.

Numerous installations have been running for over 20 years without any downtime.

Unfortunately, cybercrime has become a daily threat. The impact of hackers on oil and gas installations can be disastrous. Multi-level security features, port blocking and encryption are some of the features preventing unauthorized access.

Simplicity is the ultimate sophistication

Most of the oil and gas personnel are engineers with multidisciplinary skills and know how. Hence they should be relieved from having to handle a highly complex telecommunication network. Therefore, the network must be **easy to manage** – making sure that users can be supported for their mission critical applications at all times.

The simplicity for the user and the quality design of OTN Systems' products guarantee the lowest possible TCO (Total Cost of Ownership).

The network management software of XTran, called TXCare, has been developed to allow the operator to configure, visualize and monitor the entire network from one or more central locations. Special attention was paid to the user interface. The menus are self-explanatory, the representations are highly graphical and error messages are straightforward to be handled, without the need for an extensive training.

TXCare allows the network engineers to configure the network entirely off-line. In this way all bottlenecks can be verified in advance and surprises during the network roll-out are avoided.

Industry-standard interfaces make it easy to connect legacy or new equipment to the communication backbone without the need for converters, specialized knowledge or technical support. If a network card needs to be added or replaced, this can be done by the operational staff without the need of detailed network expertise.

Multiple applications require guaranteed throughput while having very specific requirements.

Simple, yet so versatile

An oil and gas operation demands a solid communication network. Multiple applications require guaranteed throughput while having very specific requirements. CCTV video traffic assumes a very short delay between camera and control room, a radio network might need synchronous links while legacy terminals may still use analog interfaces.

OTN Systems network users do not need to worry about these challenges as XTran overcomes complexities by providing a mature multi-service solution powered by MPLS-TP. Predictability is key for operational telecom networks. With XTran, in conjunction with TXCare, one is able to configure the delay, wander and jitter of each individual connection. All data traffic is combined on a single network ensuring 100% separation between the applications without jeopardizing performance or data security.

No matter how stringent your networking requirements are, OTN Systems will handle them to your full satisfaction.

A wealth of portfolio options

An XTran network consists of nodes, interconnected by Ethernet, and a management system called TXCare. A variety of node types is available providing the ideal solution for each location. All nodes are hardened for harsh environments. The network is perfectly scalable from tens to thousands of nodes. Any topology can be constructed with the XTran portfolio. On the WAN side, 1Gbps Ethernet, 10Gbps, 40Gbps and 100Gbps interfaces are available.

The XTran nodes come in many different flavors. They all use MPLS-TP to communicate with each other which means that protection can be guaranteed to the lowest level in the network. For an overview of the different models, refer to the table on page 9.

Power supplies (PSU) can be DC or AC and can be duplicated in most node types. Obviously, the Common Switching Module (CSM) can also be duplicated. An SD card in the CSM holds all configuration data making a replacement extremely fast and easy. The modules are hot swappable.

In order to increase the availability of the different services, MPLS-TP allows various protection schemes to be configured. Back-up paths can be created to cope with failures, while protection switching is guaranteed for any network topology. “Hitless switching” further increases the availability of TDM based services. By activating this feature, zero data loss can be guaranteed as the information will be transmitted over two different paths and compared at the receiving end. A switch-over without data loss will take place as soon as the main path shows deficiencies.

XTran comes with an unprecedented suite of interface cards for legacy equipment, including analog circuits for operational telephony as well as state of the art Ethernet/PoE. Layer 3 routing is optionally available as well. XTran can even cope with proprietary peripheral equipment as it supports protocol and speed independent interfaces on both fiber and copper.

Especially on the Ethernet side XTran offers incredible flexibility. Copper, PoE (Power over Ethernet) and fiber ports are available at virtually any speed and density. The interface cards support E-LINE for point-to-point services and E-LAN for multipoint-to-multipoint services. Multipoint services can be configured in a logical ring with subrings.

Network Management is king

All provisioning of hardware and services is done with a few mouse clicks thanks to the user-friendly network management platform TXCare. OTN Systems follows the SDN (Software Defined Networks) philosophy, providing end-to-end service enablement. It takes only a few days of training to turn a network novice into an XTran expert, having full control over the network.

A variety of XTran node types

Model	XTD-2110-A	XTR-2124-A(F)	XT-1104-A	XT-2206-A	XT-2209-A	XT-2210-A	XT-2215-A
Hardware							
Redundant PSU	✓	✓	-	✓	✓	✓	✓
Redundant CSM	-	-	-	✓	✓	✓	✓
Din rail mountable	✓	-	✓	-	-	-	-
Fan-less	✓	✓	✓	✓	✓	✓	-
Modular slots	-	-	4	6	9	10	15
Connectivity							
Ethernet (CU, F, PoE)	✓	✓	✓	✓	✓	✓	✓
Sector interfaces	2 serial	2 serial	✓	✓	✓	✓	✓
L3 Routing	✓	✓	✓	✓	✓	✓	✓
Speed							
Max WAN Speed	10G	10G	10G	10G	10G	10G	100G
Management							
TXCare	✓	✓	✓	✓	✓	✓	✓
SD Card	✓	✓	✓	✓	✓	✓	✓

XTran: MPLS for Operational Telecom made easy

Tailored for industrial applications

- Built on MPLS-TP standard
- Sector specific capabilities
- Future-proof

Intuitive and simple

- NMS made easy
- Fast diagnostics
- Seamless support for legacy

Reliable operations in harsh environments

- Optimized network security
- Unmatched network resilience
- Rugged industrial design

OTN Systems offers you peace of mind

We designed XTran around the idea that oil and gas companies should be free to focus on their operations rather than on the technology that makes it all happen.

Over the years OTN Systems built up **vast experience** in oil and gas. The specific requirements gathered from the field were accurately implemented in new releases of the company's products.

We wish to thank all our oil and gas customers for putting their trust in our products.

ABOUT OTN SYSTEMS

OTN Systems develops mission-critical networks for specific industrial markets. The company is the designer and supplier of the XTran (eXcellence in TRANsport) product line.

By working closely with numerous customers over 30 years, OTN Systems has acquired the necessary expertise to come up with perfect networking solutions. The company is headquartered in Olen in Belgium and has offices all over the world. From these regional offices the local partners and customers are supported. With its unique portfolio and more than 500 satisfied customers in 75 countries, OTN Systems promises you peace of mind when it comes to mission critical networking.

We are committed to getting your information across.

OTN Systems became part of the Belden group in January 2021. Belden connects and protects organizations worldwide with the industry's most complete suite of end-to-end networking solutions.

OTN Systems

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