Oilfield Digital Transformation

Simple, Secure, and Managed Network Communications to Remote Well Pad Sites

Production oilfields – and the Oil and Gas industry in general – are going through a variety of changes in their quest to maximize operational efficiencies, minimize environmental impact, and therefore increase their value and profitability. To be effective in this transformation, they need data. And it is not just any data – they need smart data from today's digital instruments, sensors, and automation processes.

Collection and analysis of this data requires a robust, secure, and highly reliable communications network with the appropriate throughput to handle the constantly increasing amounts of field data. Since oilfield assets are remote and spread over a large geographical area, the communication system needs to be wireless. There are many types of wireless technologies, each with its own advantages and disadvantages. Cellular is a wireless technology – and cellular coverage today is the most abundant thing available on earth other than the air we breathe! So, why not take advantage of this to help in the digital oilfield transformation?

The Persistent Data Network (PDN) is a subscription-based Simple, Secure, and Managed remote infrastructure always-on communications network that allows you to network geographically dispersed sites as if they were sedentary on an office desk
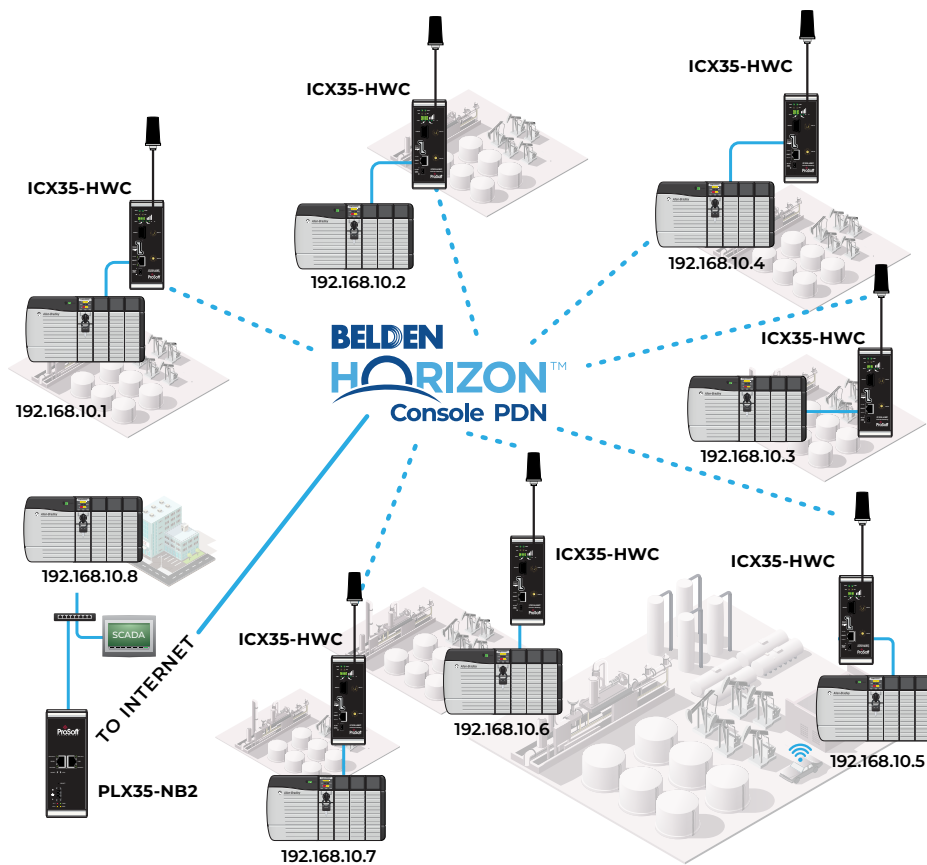
PDN is simple because to create the remote communications network, a user simply has to place the wired or wireless gateways in a project. The Belden Horizon™ Console platform is used to manage the network and the communication devices. PDN is secure because Belden Horizon Console uses the Defense-In-Depth concept to ensure the data is safe from the origin to destination. PDN achieves this by employing a number of security factors including:

- Gateways are activated using two-factor authentication
- Each gateway uses a unique one-time key to establish a tunnel to a local tunnel service
- Tunnels are encrypted using 256-bit AES encryption
- A separate and secure Web Sockets control path maintains communication with gateways
- Regular Pen testing
- Role-based access control
- Detailed activity log of user activity

Belden manages the PDN service. This allows customers to focus on their process and their main activity, which is to ensure the oilfield's network is functioning correctly.

There are several key benefits to a customer employing PDN as their remote infrastructure communications network:

- High availability and reliability
- Wireless gateways are carrier-agnostic – this mean that multiple cell carriers can be used in a single network
- Low-profile antennas reduce the cost of installation and maintenance
- Towers are installed and maintained by cellular service providers, reducing initial capital expenditures
- The gateways are easy to configure via the built-in Web server
- Low-maintenance
- Anytime, anywhere remote access that allows the customer to create an on-demand secure connection to the remote site for diagnostics
- Defense-in-Depth, always-on security

Belden Horizon Console and vLOTO™

The anytime, anywhere remote access of PDN is enhanced with Virtual Lockout-Tagout (vLOTO), which allows authorized plant personnel to control when and how their remote PAC is accessed. The user requests access for a specific period of time, which the authorizer(s) must approve. The authorizer(s) can deny or revoke access at any time. Companies can also access a thorough activity log of permissions, acceptances, and denials to meet security requirements.

PDN and vLOTO are both accessed via Belden Horizon Console. At its core, this is a cloud-native platform designed to help users worldwide monitor and troubleshoot their remote equipment from anywhere they have an Internet connection. It doesn't require software installation, eliminating a common entry point for hackers. Layer 2 networking provides an avenue for secure connections.

By providing a secure, managed space for remote connectivity, Belden Horizon Console is allowing end users the opportunity to optimize their time by decreasing unnecessary visits to oilfield equipment, and reducing downtime.

Summary

Persistent Data Network is a simple, secure, and managed cloud-based infrastructure communications network to connect geographically dispersed sites. PDN offers multiple advantages over traditional networking like radio-based or leased line communications. PDN is ideal for remote well pad installations that want to benefit from digital transformation to improve operational efficiencies and therefore value and profitability. The simplicity, reliability, and security of the PDN service allows these companies to focus on what is important to them – the process and service to their customers.

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