CASE STUDY

Fraser Surrey Docks

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Fraser Surrey Docks (FSD) was looking to improve efficiency, track equipment and ensure a high level of connectivity to their Terminal Operating System. Their objective was to reduce the need for frequent hand held radio use, allowing better communication for safety and high priority voice communication.

Two factors contributed to the successful deployment of the FSD network: the right technology and the right partner

1. Selecting the right technology

A few years ago, FSD determined the need for a mobile network connecting to their "fleet" (reach stackers, straddle carriers, terminal tractors, etc.). They engaged a local major telecommunication provider to deploy a 2.4 GHz Wi-Fi network, which primarily consisted in the deployment of numerous radios throughout the container yard.

The Problem

This Wi-Fi network presented a number of issues, primarily high levels of RF noise and RF congestion. This resulted in network saturation and the inability for the vehicles to remain consistently connected. In addition, the solution didn't provide the level of desired security.

The Solution

A consultant was hired to resolve the poor performance of the wireless network with a focus on redesign and use of directional antennas. However, due to the terminal being located within a city, with high rise buildings and many residential users, it became quickly obvious that the 2.4GHz band was not going to work. Alternative options were considered:

1. A first was to go with a cellular provider and a virtual private network (VPN) back to the primary network. However, this proved to be costly. There was also a cost for the VPN licensing and the security that related to it. Further, this solution utilized the company's available bandwidth that would have been better utilized by office users.
2. A second solution considered alternative private 802.11n network options. FSD elected to go with this option and selected Rajant for its InstaMesh technology.

FSD calculated a 2-year ROI for implementation of a Rajant wireless network at their terminal.

Rajant InstaMesh® Technology

Rajant and its patented peer-to-peer InstaMesh networking technology are designed to provide robust reliable networks for mobile environment, ensuring operators remain in control no matter where their assets travel.

Rajant's Instamesh protocol allows meshing between all nodes, allowing communication even when direct line of sight to an infrastructure device isn't available. Rajant's solution also provides multiple radio meshing, meaning each node has multiple radios built-in, allowing the radio to work its way around congestion and noise.

The Rajant technology met FSD's requirements by providing:

- ✓ A private wireless network
- ✓ Rugged equipment designed to survive the harshest environments
- ✓ Secured communication
- ✓ Reliability

FSD had strict wireless network performance requirements:

- ✓ 98% connectivity
- ✓ Security through a Radius Server Utilizing Enterprise WPA2 encryption
- ✓ Multiple VLAN Support
- ✓ IP67 rated for vibration, water resistance, heat and cold for the winter months
- ✓ Ease of use for troubleshooting and repair of hardware (affecting vehicle uptime)
- ✓ Bandwidth minimums for Terminal Operating Software (TOS)
- ✓ Redundant site connections with automatic failover due to fiber failure or spot power failure

2. Partnering with the right vendor

The Problem

Fifty Rajant Breadcrumbs were initially installed. However, the deployment suffered fom several challenges, including: host flapping, random network wide outages, poor throughput, congestion, RF noise, and even selection of incorrect frequencies and radio models for the environment. After initial deployment and less than expected performance, Rajant recommended 3D-P, a preferred Kinetic Mesh Solution Partner, for their deep experience and expertise in challenging outdoor industrial environments to redesign and redeploy the network.

The Solution

3D-P recommended a redeployment of infrastructure, using dual 5GHz radios, moving all traffic off the overly congested 2.4GHz spectrum, and a complete change of antennas to a lower gain multi-polarity antenna that would take advantage of the large amounts of multi-path in the environment, rather than fighting against it. 3D-P also helped the site troubleshoot several backhaul issues that were causing flapping and performance challenges. Over 3 days, 3D-P and FSD IT performed additional installations of infrastructure nodes, adjusted deployment of others and updated several configurations. At the end of the 3 days, 3D-P used their own Intelligent Endpoint hardware and network monitoring software to test the performance of the FSD network from the clients' perspective. The tests monitored throughput and latency, with separate tests conducted for both Mesh 5GHz channels.

Results showed 100% coverage on both channels and throughput averaging between 2 and 20Mbps over the entire site.

Additional changes were made after these tests were conducted, primarily around backhaul which again increased network performance. However, additional heatmapping was not performed due to production time constraints.

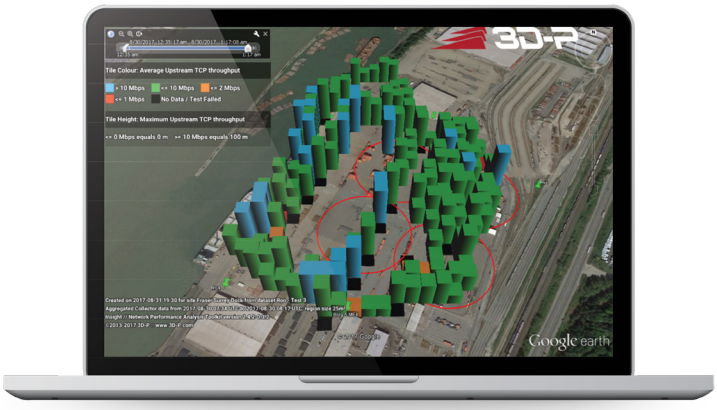

Fig. 1 - Results showed 100% coverage on both channels and throughput averaging between 2 and 20Mbps over the entire site

3D-P solutions make Smart IoT (Internet of Things) a reality for mining. Through a complete range of wireless connectivity solutions, custom wireless design specific to the challenges of the industry, and the powerful edge-computing capabilities of the Intelligent Endpoint (IEP) product line, 3D-P provides both the connectivity and edge computing capability necessary for optimal management of your operations every day.

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