

# ENABLING THE CONNECTED PORT

Chris Mason, Director of Business Development,  
EMEA Market, Rajant Corporation



As global trade increases, ports in turn are thriving. However, some aspects of their operations appear to be stuck in the past, with most container ports still manually operating gigantic container yards. For terminal operators, finding the right container can be like finding a needle in a haystack – especially in today’s ports, which can move around 11,000 cargo containers daily. But as the demand for goods rises, so too does demand to move a greater volume of containers faster and more efficiently.

To counteract this need, more and more Internet of Things (IoT) sensors, systems, and technologies are being implemented to interconnect people, equipment, infrastructure, vehicles, and other critical assets. In particular, port officials are evaluating and looking to implement mobile communication technologies to help them improve productivity and reduce operational costs.

## SMART PORTS

Ports are extremely complex, with countless operational and security functions involved in the successful movement of cargo. Connectivity is crucial for helping operators to mobilize these functions and overcome the complexities. However, movement of the world’s goods requires more than an average network. It requires a highly secure and highly mobile network; one which can open doors to new possibilities and revolutionize the way port operators work.

The Industrial Internet of Things (IIoT) is emerging as the main driver of the revolution of today’s ports, aiding smarter yard operations. This level of port connectivity has the potential to not only maximize operational efficiency and productivity, but to also truly transform port business models by giving operators the ability to predict equipment health and performance, create autonomy and deliver new services.

## CREATING A LIVING NETWORK

If port operators are to exploit the capabilities of the IIoT, they must be backed by a reliable, robust and secure wireless mesh network; a strategic asset which can cost-effectively provide port-wide access and ensure network-wide support for a variety of applications.

Such a network must also be easily scalable to support hundreds of high-bandwidth nodes, providing ports with the ability to leverage their network investments, while adding capacity and reach whenever and wherever it is needed throughout the port.

## CONNECTING PORTS

Rajant Kinetic Mesh® technology has the ability to deliver the robust and mobile-enabled connectivity that ports need to fully capitalize on the opportunities of industrial IIoT. Thanks to Rajant’s BreadCrumbs, and its ability to communicate peer-to-peer, via multiple simultaneous connections, information can be shared back and forth in a fully mobile, highly resilient web of communications. Furthermore, BreadCrumbs can maintain these peer connections simultaneously, even while in motion and autonomously link to other nodes as they come into range - ensuring that no connections need to be broken for new ones to be made.

For instance, if one path becomes blocked or interference is identified from container or equipment movement, or other port operations, Rajant’s InstaMesh technology dynamically redirects traffic over to another available path, with the network automatically optimizing itself with changing conditions. BreadCrumb nodes can also be directly deployed on a port asset – be it a vehicle, quay crane, RTG, straddle carrier, light mast, or drone – essentially turning that asset into a network node. These can then communicate not

only with centralized access points, but with other moving nodes in the network as well; meaning that all are able to share information back and forth in a highly interconnected web of communications – providing total network mobility.

## MAKE-OR-BREAK CONNECTIVITY

As one of Europe’s largest sea ports, with excellent multi-modal connections to Europe’s major cities and centres of consumption and production, it is only natural that DP World Antwerp required an intelligent and rock-solid IIoT infrastructure to support its operations. Ensuring end-to-end reliable, fast and secure wireless connectivity across the surface of DP World Antwerp’s yard was a challenge in itself, but doing so while overcoming environmental interference would be no mean feat.

However, due in part to a proven track record in serving industrial environments, Rajant’s wireless Mesh technology was chosen by BT to help form a wireless backbone concept which could meet DP World Antwerp’s complex demands. Rajant’s “Make-Make-Make-Never-Break” method of forming connections played a great part in this, ensuring that no connections had to be broken for new ones to be made – ultimately, providing DP World Antwerp with a solution to its interference challenges.

Powered by Rajant’s Kinetic Mesh technology, BreadCrumb nodes are able to create an intricate, yet robust set of frequencies which can send and retrieve signals, while continuously shifting to provide the best route for the signal. For instance, if a certain path becomes unavailable, or an object obstructs coverage, the nodes are able to identify and use an alternative route to redirect the data, using Rajant’s InstaMesh technology. The network can dynamically adapt connections to moving vehicles such as



containers or large ships, meaning that DP World Antwerp can keep up with its changing environment.

The BreadCrumbs system can also communicate with any Wi-Fi or Ethernet-connected device to deliver low-latency, high-throughput data, voice and video across the meshed, self-healing network. And with the ability to seamlessly combine fixed, wireless and mobile nodes together, it ensures that DP World Antwerp's critical data always gets to where it needs to go, quickly.

This is a key driver in enabling DP World's digital transformation of the terminal, which handles 2.5 million containers every year, 3,000 trucks daily and almost 950 ships annually. As part of this, the terminal operator will be able to provide secure and resilient connectivity for 900 employees at Antwerp Gateway and for the changing demands made of connected devices. Additionally, DP World will be able to analyse and optimise processes and operations, such as the movement of vehicles around the terminal. Not only does this provide an end-to-end view of its operations to enable timely analysis and decision making, it also ensures their large-

scale operations perform efficiently and effectively.

Successful deployment of the wireless backbone solution at Amtwerp has created a robust and reliable infrastructure for future IIoT deployments, opening up the possibilities of automation, Artificial Intelligence and data-centric future growth.

#### **THE FUTURE OF SMART PORTS**

In light of this, it's clear that wireless mesh networks are emerging as the preferred solution for delivering the mission-critical performance demanded by modern port operations, such as those at Antwerp. As global trade continues to grow, the need for continuous, wireless-on-the-go connectivity for supporting new and innovative applications is clear. By adopting a network that can readily adapt to constant change—a living network, as such—port operators are able to protect their assets with improved situational awareness, while meeting increasing demand to move a greater volume in and out of their ports. Not only does this ensure operators are able to keep ahead in an increasing fast-paced industry, but also enables them to capitalise on new revenue-generating opportunities.

#### **ABOUT THE AUTHOR**

Chris Mason is the Director of Business Development for the EMEA Market at Rajant Corporation. Prior to joining Rajant, Mason worked with British Telecom (BT) in a variety of sales, business development and management roles to help worldwide organizations identify IT solutions for common business challenges. Mason has experience with the United Kingdom's Terrestrial Trunked Radio (TETRA) network for the Emergency Services and the Ministry of Defence. He holds a Bachelor of Arts and Master of Science in Telecommunications Business from University College London and is an active member of the Institute of Directors.

#### **ABOUT THE ORGANIZATION**

Rajant Corporation is the exclusive provider of private wireless networks powered by the patented Kinetic Mesh network, BreadCrumb wireless nodes, and InstaMesh networking software. With Rajant, customers can rapidly deploy a highly adaptable and scalable network that leverages the power of real-time data to deliver on-demand, mission-critical business intelligence. Rajant is headquartered in Malvern, Pennsylvania, with additional facilities and offices in Arizona, Kentucky, and Alabama.

#### **ENQUIRIES**

[www.rajant.com](http://www.rajant.com)