

HOW TO MAKE YOUR WIRELESS NETWORKS INDUSTRIAL STRENGTH



A Practical Guide To Understanding The Fundamental Requirements
For Reliable, High-Performance Industrial Wireless Networks



Systems, Inc.

Are You Getting the Performance You Need from Your Industrial Wireless Network?

The reality is, too many enterprises have been content to use wireless communications technologies that aren't designed to deal with the more demanding requirements of dynamic indoor and outdoor industrial environments. Reliance on working but outdated wireless technology is proving to be a significant issue that can adversely affect enterprise connectivity, reliability, productivity and profitability. It's easy to see why.

Your industrial environments present a unique set of requirements not found in your carpeted spaces. Today's industrial networks face a volatile and evolving set of difficult communications challenges.

MORE DEMANDING REQUIREMENTS

Your industrial environments present a unique set of requirements not found in your carpeted spaces. Today's industrial networks face a volatile and evolving set of difficult communications challenges. They must ensure persistent mobile connectivity for workers, vehicles and equipment. They must operate at peak efficiency in interference-riddled spaces. They must offer flexible, pervasive coverage indoors and outdoors. They must survive and excel in extreme temperatures and under the harshest weather conditions, and they need to provide integrated, proactive network management. Above all, industrial networks must deliver mission-critical reliability no matter how challenging the environment.

MAKING THE RIGHT DECISIONS

The network decisions you make must take into account these and other challenges that are unique to difficult industrial environments like plants, warehouses, distribution centers, depots, yards, ports and more.

You need a network that ensures maximum quality of service for your end users in your industrial spaces, providing the power and performance to make sure each line-of-business application and real-time conversation is supported with reliable, secure connectivity. You also know that this can be easier said than done.

ACTIONABLE ANSWERS

The time is right to take a closer look at your current industrial network strategies and technologies and determine if they're delivering the performance, security, and productivity you need from them. In the Zebra Technologies companion paper, "Is Your Wireless Network Industrial Strength?" crucial questions were posed to point out the issues involved in ensuring that your wireless networks perform powerfully and reliably in highly complex industrial environments and under the most stringent conditions. This guide provides actionable answers to those questions. It is divided into seven sections, each examining one of the fundamental challenges to creating successful, hard-working industrial wireless networks. Each section highlights some of the most important ways Zebra's wireless technology expertise and innovation ensures that your WLAN is truly industrial strength.

Eliminating Bottlenecks and Network Outages

AS YOU BEGIN TO OPTIMIZE WIRELESS COMMUNICATIONS IN YOUR INDUSTRIAL ENVIRONMENTS, THE FIRST STEP IS CHOOSING THE RIGHT PLATFORM ARCHITECTURE.

Zebra WLAN solutions ensure business continuity while eliminating costly and painful downtime for industrial workers and staff. Reliable networking can be established virtually anywhere and almost instantly — even if the link to the controller should go down.

Your goal should be to minimize network congestion and bottlenecks. The optimal solution is a backbone architecture with distributed intelligence. In typical wireless LANs, all traffic is routed through a wireless controller. That can be a problem; when traffic increases or spikes there can be significant controller delays, causing performance levels to drop substantially. In your industrial environments where latency, jitter and packet-loss are at a premium, you need a new type of architecture.

Zebra Technologies developed the WING 5 WLAN architecture to solve these congestion issues. The architecture is purpose-built to accommodate the 10-fold increase in traffic enabled by the 802.11n standard, as well as the 30-fold increase enabled by the new 802.11ac standard. It's also designed to easily and cost-effectively handle the complex demands of the evolving industrial environment.

The WING 5 distributed architecture helps you segment and route your traffic to eliminate system outages, avoid congestion and bottlenecks and help you control and optimize bandwidth. Distributed intelligence is the key. By distributing controller intelligence to the access points, the architecture maximizes performance with low delay and latency, and improves network resilience by reducing or eliminating congestion and single points of failure.

Zebra WLAN solutions ensure business continuity while eliminating costly and painful downtime for industrial workers and staff. Reliable networking can be established virtually anywhere and almost instantly—even if the link to the controller should go down. This translates into greatly reduced administrative and maintenance costs and saves precious IT resources.

The result is substantially improved performance with applications that don't stall, audio that is crisp and clear, video that is not jittery, and mobile service that is highly reliable for your business-critical line of business applications. The architecture also maximizes end user Quality of Service (QoS) throughout the network with smart, network-aware access points that intelligently and automatically determine the best direct routing paths.

Connecting in Chaotic Environments

UNLIKE THE CARPETED SPACE, INDUSTRIAL WIRELESS ENVIRONMENTS AREN'T RELATIVELY COOL, CALM AND PREDICTABLE.

They're just the opposite and always in a state of flux. With constantly moving merchandise, manpower, equipment and vehicles, industrial environments can change their wireless characteristics hour-by-hour, or even minute-by-minute. These are dynamic spaces containing significant RF obstacles ranging from rolling stock to tractor-trailers to cargo ships being loaded and unloaded to steel-walled containers stacked seven high. Your network must be able to automatically adapt to these changing requirements.

INTELLIGENT CONNECTIVITY

Zebra has embedded innovative wireless technologies into the WiNG 5 architecture that help you overcome your most challenging connectivity issues. The architecture's built-in SMART RF algorithm delivers outstanding interference mitigation, enabling the network to autonomously adjust its physical (e.g. power, channels, etc.) configuration to mitigate the impact of obstacles on wireless coverage and deliver exceptionally reliable service in real time. SMART RF is a multi-faceted technology that helps ensure connectivity in a number of critical ways.

Today's complex industrial spaces tend to be prone to constant change that can wreak havoc on wireless communications. This includes changes such as new or relocated equipment, temporary walls or structures and any other environmental changes within a facility that can drastically alter WiFi propagation.

SELF-FORMING NETWORKS

It begins with initial configuration. During network setup and deployment, Zebra Access Points (APs) empower the network to self-form and self-configure by automatically recognizing and learning from one another. SMART RF enables APs to accurately adjust power levels and channel assignments, eliminating gaps in coverage and minimizing co-channel interference. The result is simpler, faster network deployment, installation and configuration.

PERSISTENT CONNECTIONS

Today's complex industrial spaces tend to be prone to constant change that can wreak havoc on wireless communications. This includes changes such as new or relocated equipment, temporary walls or structures and any other environmental changes within a facility that can drastically alter WiFi propagation. The addition of new temporary wireless signals onsite, such as personal Wi-Fi hotspots with cellular backhaul, can also disrupt the flow of traffic. The network sees these changes as sources of interference. With the SMART RF algorithm searching for interference every two seconds, the APs can dynamically adjust their power levels and channel plans whenever necessary, ensuring strong coverage and connectivity throughout the facility.

SELF-HEALING RELIABILITY

Zebra industrial WLAN networks are also self-healing, able to optimize resiliency and availability in the event of a physical failure such as an AP losing power. SMART RF technology enables the network to immediately recognize that an access point has gone down, and to provide sustained backhaul of collected traffic via another AP or node. All neighboring APs automatically adjust their power levels and, if required, change their channel assignments to cover the RF space previously served by the downed AP.

Industrial communications environments are increasingly empowered by mobile connectivity for workers on foot and moving vehicles that need session persistence to roam throughout the facilities, indoors, outdoors and to and from one environment to another.

FAST, SEAMLESS ROAMING

Industrial communications environments are increasingly empowered by mobile connectivity for workers on foot and moving vehicles that need session persistence to roam throughout the facilities, indoors, outdoors and to and from one environment to another. Zebra technology supports continuous connectivity for mobile workers' devices, automatically forwarding credentials ahead to enable users to roam between APs without the need for reauthorization.

The network can also be configured to adjust its power levels dynamically so that a single specific device, a certain type of device, or any device running a particular high-priority application will maintain a minimum specified data rate as it moves throughout the site or facility.

With this SMART RF feature, the system automatically optimizes access point power to ensure signals won't fade as those devices move farther away from any single access point, thereby protecting the productivity and satisfaction of the mobile worker. In addition, SMART RF is application-aware; when it detects voice clients, it automatically stops scanning to ensure continued connectivity with low latency and minimum delay.

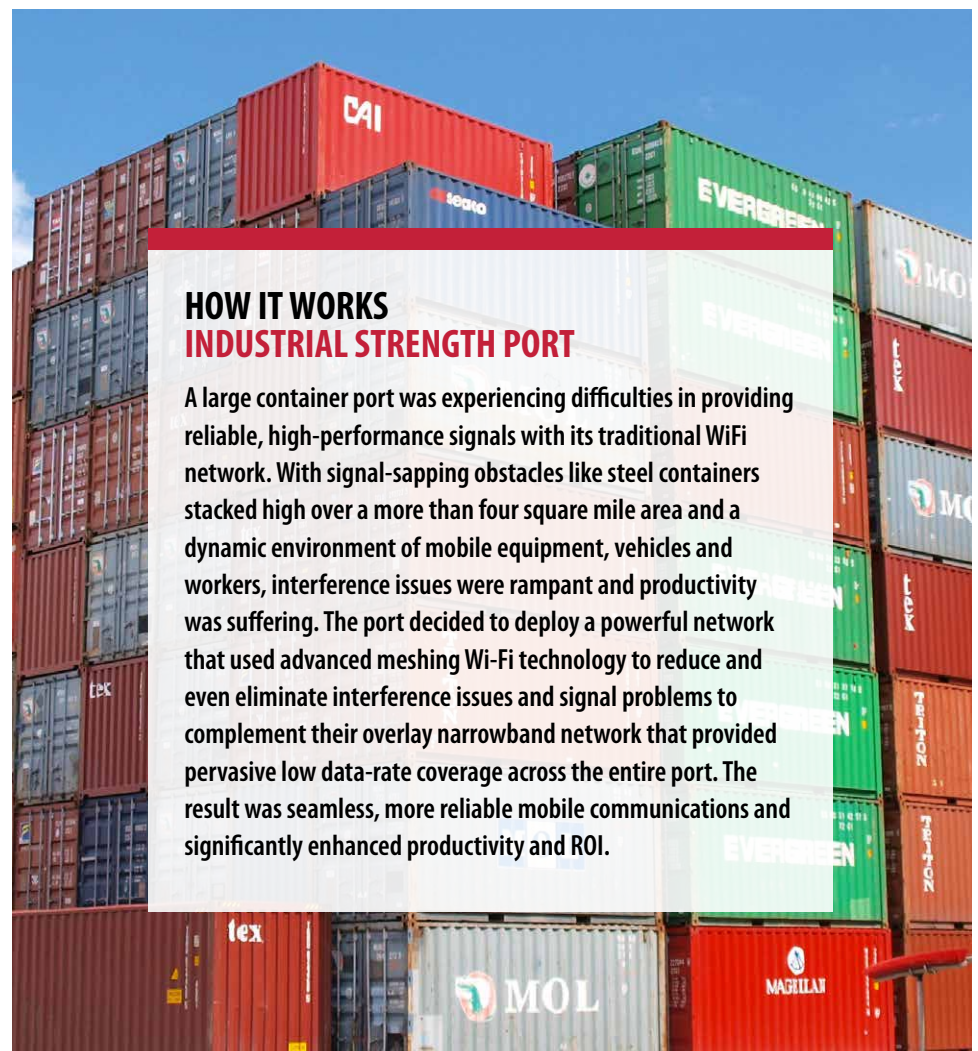
Connectivity for workers on vehicles roaming within and across your industrial facilities is also crucial in the industrial space. Many of these vehicles, such as forklifts, are equipped with vehicle-mounted computers and move at moderate speeds between indoor and outdoor environments. MeshConnex complements SMART RF, and the two work hand-in-hand to ensure physical and logical settings for the network are optimized to support mission-critical wireless connections. Zebra MeshConnex routing engine provides for low hop latency, high-speed handoffs and proven scalability to support fast and seamless roaming from one AP to another.

Many vehicles may move at higher speeds of up to 50 mph or more. These are typically speeds that standard 802.11 Wi-Fi networks normally can't support. The MeshConnex algorithm combines with Zebra's predictive analytics to ensure persistent connectivity, even for fast-moving vehicles or remotely guided equipment equipped with vehicle-mounted modems (VMMs) such as AGVs, hostlers and forklifts.

EXTENDING COVERAGE

MeshConnex also allows you to extend reliable and robust coverage and connectivity to places that are hard to reach or where it is cost-prohibitive to run cables to the LAN. With MeshConnex technology, one of the AP radios can be used for servicing clients, while the other is used to backhaul data to a neighboring AP or node that is connected to the LAN via Ethernet cable. The AP dynamically and proactively determines the best path to send and route traffic via adjacent nodes.

In the event of an external incident that alters the connection between a meshed AP and its primary node, or if the node goes down due to a malfunction, MeshConnex quickly establishes a connection with the next best node. MeshConnex and SMART RF work seamlessly together to ensure maximum uptime with minimal disruption to business operations. This is all accomplished automatically, without requiring IT resources to manually update or adjust settings.



HOW IT WORKS

INDUSTRIAL STRENGTH PORT

A large container port was experiencing difficulties in providing reliable, high-performance signals with its traditional WiFi network. With signal-sapping obstacles like steel containers stacked high over a more than four square mile area and a dynamic environment of mobile equipment, vehicles and workers, interference issues were rampant and productivity was suffering. The port decided to deploy a powerful network that used advanced meshing Wi-Fi technology to reduce and even eliminate interference issues and signal problems to complement their overlay narrowband network that provided pervasive low data-rate coverage across the entire port. The result was seamless, more reliable mobile communications and significantly enhanced productivity and ROI.

Hard Working Solutions for Hard Working Spaces

INDUSTRIAL ENVIRONMENTS ARE HARDLY KNOWN FOR BEING NEAT AND TIDY.

They are hard-working areas where dust and dirt can degrade performance and shorten useful life. Temperature extremes can cause networking equipment to freeze or overheat, shutting down or disrupting service. Humid conditions can cause moisture to seep into radios, not only degrading performance but often causing permanent damage. Although third party NEMA enclosures can help solve these challenges, they aren't the only viable solution to consider.

INTELLIGENT, TOUGH TECHNOLOGY

Zebra offers a wide range of industrial-strength access points that can be deployed in any environment—indoors, outdoors and everywhere in between. For example, in a typical cold storage application, APs must normally be situated outside the area due to their inability to withstand the extreme temperatures within the freezer or chiller environment. Organizations often resort to either trying to “blast in” WiFi from just outside the freezer, or they bifurcate their cold chain operations and run them in “batch mode,” which provides no real time access, updates or visibility.

Zebra solves these issues with ruggedized APs that can be located inside a cold storage or freezer area. Purpose-built to work in severe cold or heat, Zebra radios have the ability to provide coverage within the most extreme indoor and outdoor environments, resulting in more accurate, real-time communications to protect employee productivity and safety, while also helping industrial customers ensure product safety.

Zebra offers APs that provide embedded self-contained environmental protection with ruggedized IP67 enclosures, eliminating the need to purchase third-party NEMA enclosures for use in harsh indoor or outdoor locations.

PLENUM-RATED AND PERMISSIVE-CHANGE FLEXIBILITY

Zebra offers APs that provide embedded self-contained environmental protection with ruggedized IP67 enclosures, eliminating the need to purchase third-party NEMA enclosures for use in harsh indoor or outdoor locations. Of course, using an AP that was designed for outdoor usage inside an industrial building isn't as easy as simply hanging that AP in the ceiling. Two major considerations need to be accounted for when pursuing this approach.

First is the need for plenum-rated casings to guarantee materials used in constructing the units comply with all indoor safety and environmental regulations. Second, is the requirement for permissive-change functionality that ensures power levels and channel frequencies can be adjusted in software to comply with FCC guidelines for indoor APs, which differ significantly from outdoor APs. Without meeting both of these requirements, deploying APs in particularly harsh or extreme indoor industrial facilities can be a risky and expensive proposition.

Ensuring Connectivity for Multiple Classes of Devices

REGARDLESS OF THE NUMBER AND TYPES OF DEVICES YOU USE, ZEBRA WLANS HELP ENSURE PERSISTENT CONNECTIVITY.

As the industrial space relies more and more on mobile communications, your network must be able to support the multitude of mobile communications devices already on the market, not to mention the new ones arriving seemingly every day.

Zebra networks support devices such as powerful desktop and laptop computers, as well as ruggedized handheld and wearable computers, bar code scanners, RFID readers and even consumer smartphones and tablets.

Zebra networks support devices such as powerful desktop and laptop computers, as well as ruggedized handheld and wearable computers, bar code scanners, RFID readers and even consumer smartphones and tablets. Although the ideal situation from a management and configuration standpoint would be to provide all mobile workers with uniform, industrial grade handheld devices like Zebra's MC75 handheld computer or ET55 enterprise-grade tablet, in many cases the reality is considerably different, requiring a broad mix of different device types for different workers, each optimized to their job function or task.

POWER AND INTELLIGENCE

Zebra's thorough understanding of the intricacies of RF planning and connectivity enables its industrial networks to take into consideration the RF power and connectivity issues inherent in the mobile devices of today and tomorrow. Mobile devices other than laptops—such as handheld computers and workers' personal devices—often have considerably less transmit power and much lower receiver sensitivity, presenting significant roadblocks to connectivity. Most networks in place today were not designed specifically to support the different RF performance of these devices, and most wireless planning software today builds coverage and design recommendations not for these devices, but for higher-powered laptop computers. Your industrial network must be able to support a wide range of different mobile devices of differing receiver sensitivity and power levels, and that starts with the planning stage.

Claims about power performance of a network should relate not only to the strength of a wireless signal that will be seen by a device, but the device's battery life as well. Zebra ensures power performance by building extensive technological and networking knowledge and expertise into industrial wireless solutions across both the network and device elements. When you operate most Zebra mobile computers on a properly configured Zebra WLAN, you can achieve a battery life improvement of up to 20 percent on those devices.

SMARTER SENDING AND RECEIVING

Zebra's SMART RF Autopower capabilities enable the network to automatically increase or decrease power from the AP. This enhances connectivity by compensating for different devices with different RF signatures, varying transmit power levels and disparate receiver sensitivities. Zebra intelligent access points are purpose-built with higher output power, advanced antenna design and robust receiver sensitivity, providing strong listening capabilities to recognize even weak device signals at the same time they mitigate the exceptionally high interference inherent in complex industrial environments.



HOW IT WORKS

COLD STORAGE CONNECTIVITY

A distribution center with an extensive cold storage facility finds that in their freezers, where temperatures can reach -30°C or lower, indoor-rated access points are simply unable to function properly in sub-zero environments, sometimes even with NEMA enclosures. By deploying select Zebra outdoor APs that carry plenum ratings, provide software-triggered permissive change functionality and are inherently rated to operate to either -30° or -40°C, the DC is now able to deliver outstanding performance in a wide range of temperature-challenged applications.

Managing Bandwidth Dynamically

ONE OF THE MOST CRITICAL CONSIDERATIONS AS YOU DEVELOP A NEW OR UPGRADED INDUSTRIAL NETWORK IS WHICH—AND HOW MANY—APPLICATIONS YOU PLAN TO USE.

Mobile communications, M2M automation, data transmission, VoIP, Mobile streaming video and video surveillance, And perimeter security are applications you can take advantage of. As your applications portfolio grows, your need for bandwidth grows with it. With these common industrial applications—plus the growth of browser-based network access and cloud-based native applications—it is clear that your industrial network will soon experience a major increase in traffic, if it hasn't already. It is also quite clear that office-grade network solutions will most likely be unable to deliver the robust, reliable and pervasive bandwidth you need, when and where you want it.

Zebra WiNG 5 WLAN architecture helps you segment and route your traffic to help you dynamically manage bandwidth so you're able to deliver the right amount of throughput to the right application at the right time.

Because so many of today's applications are bandwidth intensive—and because bandwidth is finite—it is important to be able to manage your throughput efficiently and effectively. Zebra WiNG 5 WLAN architecture helps you segment and route your traffic to help you dynamically manage bandwidth so you're able to deliver the right amount of throughput to the right application at the right time.

CLIENT CONNECTIVITY

More and more of today's applications, however, require larger amounts of bandwidth. Zebra WLANs enable you to prioritize traffic and place the highest priority on devices and applications—such as VoIP and streaming video—that demand the highest levels of bandwidth. IT administrators can specify minimum data rates and AP should sustain for particular client devices sending particular types of traffic. This means an AP will increase power as one of these devices moves further away from it, automatically sustaining the minimum guaranteed data rate and providing consistent levels of throughput in support of bandwidth-intensive priority applications. Zebra industrial wireless networks make certain your high-bandwidth applications avoid dropped packets by receiving the high levels of throughput they need precisely when and where they need it.

CLIENT LOAD BALANCING

Whenever a large number of devices—such as handheld computers, VoIP devices, readers and scanners—associate to the WLAN, one or more APs can choke from client overload unless there are algorithms in place to facilitate sharing the load among multiple radios. Competing vendors often set a hard limit to the number of devices supported by a single AP, regardless of what applications they are running. Video applications, for example, can demand anywhere from 5 to 10 Mbps, which can adversely impact other users associated with that access point.

With Zebra's Smart Load Balancing algorithm, industrial networks add intelligence that evaluates not only the number of devices, but also their data rates, the applications and bandwidth they are using and available AP capacity. With Zebra, the goal is maximized RF spectrum use. Client Band Steering Zebra WLAN networks also offer efficient client band steering, dynamically routing traffic to the best frequency, whether it be the 2.4 GHz or 5 GHz band. Because 2.4 tends to be noisy, many networks automatically assign any device that supports 5 GHz to the 5 GHz band. That is not always the best answer. The fact is, whatever the frequency, too many people using the band can still cause congestion. Unlike many other systems, Zebra APs can be configured to steer clients based on ratios, looking at usage and actual device utilization and automatically steering a device to the most appropriate band and/or channel. This can substantially increase performance, and give network administrators complete control on segmenting the client base.

NARROWBAND APPLICATIONS

Not all applications are bandwidth-intensive. Zebra understands that many outdoor yard and port applications don't demand high data rates, but they do require reliable cost-effective connectivity over very wide areas. Zebra's narrowband wireless networks and mobile computing technologies provide long-distance coverage, and enable you to extend low-bandwidth applications—such as text-driven applications like work orders or Telnet sessions—to every corner of your most expansive industrial sites.

You can easily overlay Zebra's narrowbanding solution to your WiFi network. This allows you to have a highly reliable, exceptionally cost-effective solution for mission-critical but low-data-rate applications to the edge of your facilities, while still enjoying a complementary robust, high-bandwidth network at the core of your hubs and terminals.

Managing Your Network Intelligently

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IF INDUSTRIAL WIRELESS ENVIRONMENTS CAN LEARN ONE THING FROM THE OFFICE SPACE, IT IS THE FACT THAT REAL-TIME WIRELESS NETWORK PLANNING AND MANAGEMENT ARE RESOURCE-INTENSIVE.

To keep your industrial network running at peak capacity and performance, you need 24/7 visibility and control of your entire network. You also need to provide proactive problem detection, troubleshooting, intrusion protection, security and network assurance.

MULTI-TASKING, MODULAR AP

Zebra innovation is also on display in its access points themselves, offering you the ability to support multiple band-unlocked radios—including a third radio that can be dedicated to monitoring—in the same enclosure. You can dedicate one radio as a network sensor for intrusion protection and detection on both 2.4 GHz and 5 GHz bands, while using the two primary radios for client access.

Additionally, Zebra's AP 8132 is the industry's first modular access point, enabling you to plug different peripherals—such as video cameras, environmental sensors and more—directly into the AP, eliminating the need for running additional cabling or power cords or purchasing special wireless accessories for these devices.

GAP-FREE SECURITY

Today's industrial environments are increasingly at risk. Many are vulnerable to serious security and reliability issues including physical perimeter breaches, network intrusion by hackers using rogue devices, compliance/ non-compliance issues and more. Zebra's AirDefense Services platform is an industry leader in delivering gap-free security, network authentication and access control, sensor and video-based monitoring, data encryption including FIPS-140 and compliance documentation.

ZEBRA NSIGHT NETWORK MANAGEMENT

Zebra NSight is a powerful and feature-rich management module which greatly simplifies network assurance, monitoring, troubleshooting, and reporting. With NSight, Zebra offers simplicity in management that is distributed across your entire network and viewable from a single-pane-of-glass. It provides you with the ability to build customized, role-based dashboards for every IT role in your organization, such as a helpdesk user, network administrator, and CIO. These dashboard views can be tailored for different decision makers, presenting each with relevant information to assist in executing the best action for your enterprise's network. Zebra NSight provides users with the unique, multi-dimensional capability to monitor and report based on time, network analytics, and user role, which can carry your investment far into the future.

Zebra NSight redefines the way IT administrators manage their network by providing real-time visibility and in-depth insight into every dimension of the network, including visibility into layer-7 applications, client devices,

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Zebra NSight redefines the way IT administrators manage their network by providing real-time visibility and in-depth insight into every dimension of the network, including visibility into layer-7 applications, client devices, users, and types of operating systems and devices being utilized.

users, and types of operating systems and devices being utilized. At a glance, the administrator can discern the top applications by usage or by count, at every level of the network. You can also prioritize applications on the network, prevent non-productivity applications, and enforce policies with WiNG's firewall and quality of service (QoS) policies, which can leverage the application context.

Debugging and troubleshooting tools can be accessed through the NSight browser interface, including packet capture, wireless debug log access, and TCP/IP ping and trace route. You can also obtain a summary of all events related to a particular device with appropriate filters applied. Moreover, you can create custom dashboard interfaces on the fly to monitor the network in real time and share all crucial parameters of an access point or client under suspicion.

Zebra NSight provides a view of device health, bandwidth usage, application usage and more—offering a basis for monitoring and analyzing the most complex scenarios. NSight also makes it easy for IT professionals to compare current usage patterns to historic trends to better plan for future growth.

The AirDefense platform also offers historical data capabilities that include detailed forensics. It provides real-time network visibility and powerful management tools, such as remote monitoring and testing, performance and intrusion alarming, centralized live network view, spectrum analysis and many more.

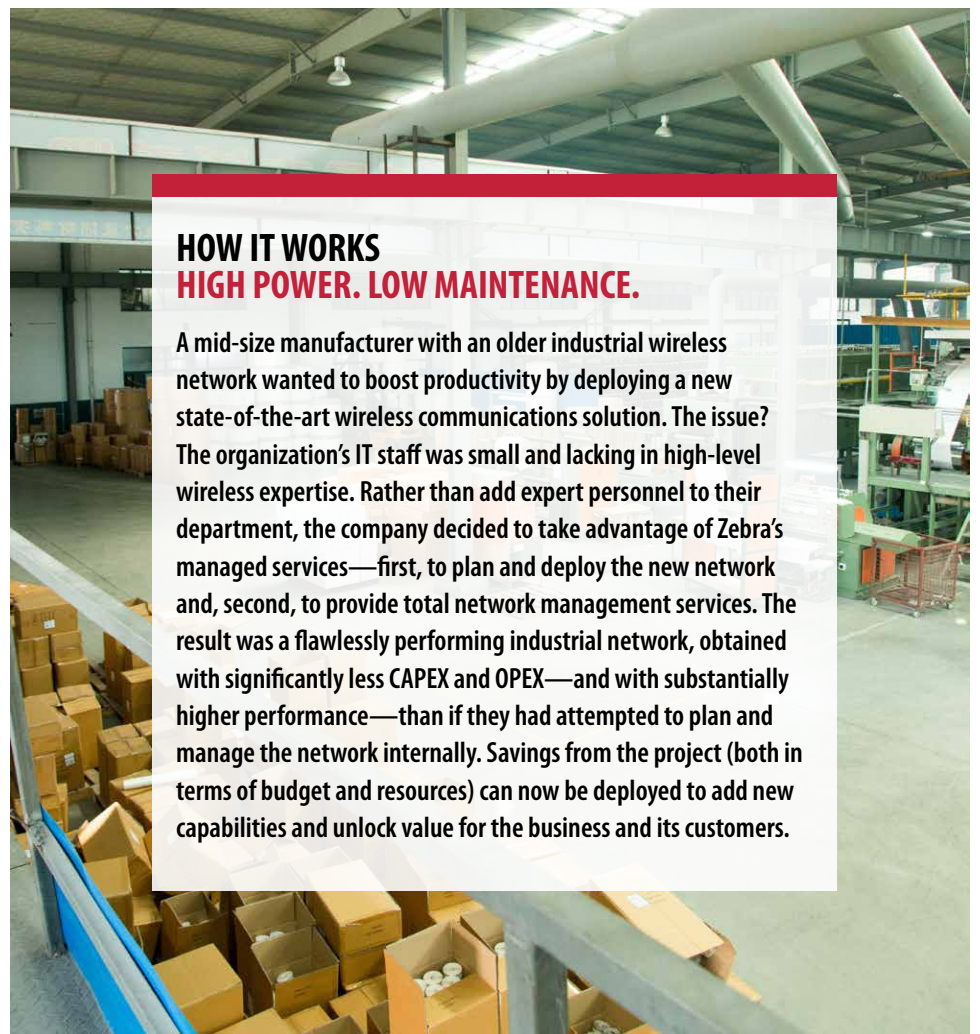
Zebra's RadioShare technology improves the network assurance cost-to-performance ratio for WLAN networks. RadioShare allows a radio on the AP to perform double duty. Not only does it handle clients, but it also acts as a sensor for applications that typically do not require full time sensors. This minimizes the need—and cost—of having separate APs, supporting Powerover-Ethernet (PoE), while at the same time increasing network functionality and monitoring.

When RadioShare is enabled, the continuous stream of data collected by infrastructure radios is passed to the network assurance software module for processing, and for access to a powerful management toolset that includes remote, real-time and historical troubleshooting, spectrum analysis, forensics and testing. RadioShare software works at the AP level, improving efficiency while eliminating the need for—and expense of—deploying a separate sensor network or purchasing APs with extra radios dedicated solely to these management and troubleshooting tasks.

COMPLEMENTARY SERVICES

Here's the big question: Do you have the internal IT resources you need to design, implement and manage an industrial strength mobile wireless network that optimizes network productivity and value? If you're not sure of the answer, it may make sense to explore the wide range of flexible services options from Zebra for your industrial wireless network. Combining leadership in mobile technology with deep knowledge of the industrial wireless space, Zebra is an industry leader in providing efficient, cost-effective services that ensure maximum WLAN value while allowing you to concentrate your internal resources on strategic business initiatives and management.

You can choose to use Zebra services individually or in a comprehensive total network management solution. Zebra's wide range of industrial wireless network services include WLAN planning and design, network security, mobile application integration, wired/WLAN network integration and a portfolio of robust managed services such as network assurance, mobile device and application management, regulation compliance, troubleshooting, network evolution and many more. Alternatively, many of Zebra's highly skilled, certified channel partners offer similar service and support solutions for designing, installing and managing an industrial wireless network on your behalf.



HOW IT WORKS

HIGH POWER. LOW MAINTENANCE.

A mid-size manufacturer with an older industrial wireless network wanted to boost productivity by deploying a new state-of-the-art wireless communications solution. The issue? The organization's IT staff was small and lacking in high-level wireless expertise. Rather than add expert personnel to their department, the company decided to take advantage of Zebra's managed services—first, to plan and deploy the new network and, second, to provide total network management services. The result was a flawlessly performing industrial network, obtained with significantly less CAPEX and OPEX—and with substantially higher performance—than if they had attempted to plan and manage the network internally. Savings from the project (both in terms of budget and resources) can now be deployed to add new capabilities and unlock value for the business and its customers.

Reducing Complexity with a Unified Corporate WLAN

IT IS EVIDENT THAT INDUSTRIAL ENVIRONMENTS REQUIRE TOUGHER, MORE RELIABLE, HIGHER-PERFORMANCE WIRELESS NETWORKS THAN THE CARPETED SPACE.

So is the answer simply to have a bifurcated network, with one system for office space and a different system for industrial environments? Some organizations may choose to go that route, but separate networks like these generally only add cost and complexity. A better, more efficient solution is to create a powerful single network you can optimize for both locations.

SPLIT PERSONALITY

Basically, you need a network with something of a split personality. First, it must excel in the more predictable, less volatile carpeted world of business-driven applications, such as high-speed data for e-mail and teleconferencing via VoIP. Second, it must be hardened and powerful enough to function flawlessly and reliably in the complex, RF-challenged, indoor/outdoor world of today's industrial spaces. The truth is, industrial wireless expertise is about much more than simply enclosing office-grade equipment in NEMA enclosures. It is also about providing pervasive coverage and mobile connectivity that delivers faster roaming, stronger security and more cost-efficient redundancy to ensure connectivity, reliability and availability.

INDUSTRIAL INNOVATION

The Zebra portfolio—including ruggedized APs and controllers—is purpose-built to deliver the performance and reliability you need to enable bandwidth-rich applications even under extreme industrial conditions. Innovation is the common denominator. Zebra solutions are currently delivering high performance in environments ranging from automated plant floors to large-scale distribution centers to the unpredictable outdoor spaces of yards and ports.

UNIFIED NETWORK MANAGEMENT

One of the most important considerations to understand as you contemplate a unified network is the ability to manage the entire network from a single, centralized control center. Zebra's NSight management software gives you real-time, 24/7 visibility of your entire network, enabling you to proactively monitor, troubleshoot, repair, secure, and streamline network assurance and performance. NSight helps you maximize uptime and productivity while lowering your Total Cost of Ownership (TCO).

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WIRELESS LEADERSHIP

As this report makes clear, planning and implementing truly industrial strength networks is a complex undertaking that requires leadership and experience and demands a history of delivering excellent results. Of course, finding a proven network solution that is equally strong in the office and the yard can be a difficult task.

There are many wireless network providers whose expertise is focused on the carpeted space. There's a smaller number that offer expertise in complex, RF-challenged industrial networks for both indoor and outdoor locations. There's only one that can truly do both. Zebra is an industry leader in offering in-depth expertise, advanced technology and a proven track record in both office-grade and industrial strength wireless solutions. This allows Zebra to provide you with advanced and comprehensive unified networks across your entire enterprise.

INDUSTRIAL STRENGTH PARTNER

As you look to enhance the efficiency and agility of workers across your industrial sites and facilities through the deployment of wireless mobility solutions, it is critical to have a trusted partner with the portfolio and demonstrated performance that can make it all a reality. Zebra is ready to help you with the expertise, the technology, and the innovative solutions that will ensure that your industrial and unified wireless networks are fundamentally sound, empowering them to deliver the value you need throughout your enterprise.

Transform Your Operations with WiNG WLAN

HIGH-PERFORMANCE WIRELESS NETWORKING FOR WAREHOUSING & LOGISTICS

With Zebra's WiNG WLAN, you can transform your warehousing and logistics operations with uninterrupted, enterprise-wide service featuring unbeatable reliability, connectivity, and data security. Using the latest 802.11ac wireless standard and an entirely new approach to network infrastructure, WiNG provides an intelligent, self-optimizing, and self-healing network that avoids the headaches of network slowdowns, disconnects, and service outages. This next generation technology delivers world-class wireless performance across all computers and mobile devices in your operations, giving you a competitive edge in achieving learner, more automated processes that maximize productivity and accuracy while minimizing errors, returns, and overall operating costs. Best of all, with an ultra-fast and zero-touch installation process, your wireless network can be up and running in no time, at up to 50% lower cost than other solutions.

WIRELESS NETWORKING EXPERTISE FROM MSA SYSTEMS, INC.

At MSA Systems, we help our clients achieve greater operational productivity, efficiency, and cost-effectiveness by providing turnkey mobility solutions that include wireless networking, hardware, software, barcoding, and RFID. Since 1996, we have been a trusted partner for clients throughout the western U.S. and around the world, including Safeway, Airtech, Beckman Coulter, Pacific Coast Fruit, and Meyer Distribution. By leveraging best-in-class wireless networking, mobile computing, and data capture technologies, we help businesses grow and improve profitability in their warehousing and logistics, inventory management, mobile sales force and field operations, and asset tracking and management.

SCHEDULE YOUR FREE CONSULTATION

In partnership with Zebra Technologies, the global leader in wireless networking and infrastructure, we are offering free consultation to help you analyze your warehousing and logistics needs and explore your options in upgrading to next generation wireless LAN. With Zebra's WiNG wireless, we can help you streamline your operations, automate critical processes, and transform your business with improved efficiency and profitability. Contact us today to schedule an appointment or arrange a call to get started. We would love to help your business!



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