proxim *wireless*

Security & Surveillance

Ultra-Secure Wireless Solutions for Security & Surveillance

Summary

In today's security landscape, organizations of all types are struggling with how to deploy broadband wireless solutions capable of ensuring the ultimate in network and data security while enabling a variety of security and surveillance applications. From financial and healthcare organizations looking to secure their customer's data to federal, state and local governments trying to deploy bandwidth-intensive video surveillance – the demand for a wireless solution capable of simultaneously providing the highest performance and security is evident.

This white paper provides an overview of the market drivers for security and surveillance applications, the benefits of utilizing wireless solutions for these applications, and the requirements a wireless solution must meet to be capable of supporting these applications. This paper will also provide an overview of Proxim's industry-leading broadband wireless solutions and how they enable the rapid, flexible and cost-effective deployment of security and surveillance applications of all kinds, and for all types of organizations.

Introduction

Needless to say, security and surveillance is at the forefront for organizations worldwide. Governments, enterprises, financial institutions and health care organizations alike are all expected – and often required – to have a certain level of security measures in place to help monitor and protect against threats. As a result, there has been a dramatic increase in the demand for security applications such as video surveillance to monitor borders, ports, transportation infrastructure, buildings and more.

Though the demand for video surveillance has risen dramatically, deploying surveillance via a wired infrastructure is both too costly and time-intensive. Emergency response and homeland security organizations need to deploy critical security infrastructure in days, not weeks or months. And though they need to deploy these systems quickly, organizations now realize that both CapEx and OpEx need to be considered while deploying complete security and surveillance systems.

Advances in digital video encoding are resulting in a trend away from analog surveillance video systems to IP-based digital surveillance video systems. As a result, organizations are increasingly turn-

ing to broadband wireless networks to provide flexible, cost-effective and rapid deployment of security systems.

These developments are changing the security and IT market landscape, creating new markets, expanding existing markets, and unveiling tremendous opportunities for innovating, selling, and installing wirelessly networked video solutions. But in order to ensure proper video delivery, application-specific quality-of-service (QoS) parameters must be supported. Key parameters like jitter and latency must be controlled for efficient and viewable video quality. The underlying network infrastructure must be capable of handling video traffic from all cameras – not just few isolated cameras.

Benefits of Wireless

Organizations are often faced with major cost and installation nightmares while providing security protection. For a growing number of security-sensitive enterprises, fixed and mobile wireless networks are the only option to deploy reliable, affordable surveillance networks capable of securing even the most difficult environments

Quickly Deployed

Availability of copper and fiber is dependent on the location, making the upgrading of existing wired infrastructure economically impractical in many areas. Wireless, on the other hand, can be deployed virtually anywhere, including over bodies of water, rugged terrain, and remote locations. Wireless networks install in hours or days (instead of weeks or months), eliminating long waiting periods and right-of-way issues associated with trenching for fiber.

Cost-Effective

Fiber based networks cost significantly more to deploy than an equivalent wireless system, often about 5x-10x more. Deploying new broadband copper networks is as expensive as fiber net- works and is impractical for medium to long range deployments. Wireless is not only more cost-effective, but it also provides the added benefit of scalability based on bandwidth requirements.

Flexible and Scalable

In many cases the deployment of wired solutions requires trenching, which can cause any number of problems. Not only is it much more expensive, but in scenarios where direct trenching would require tearing down a historic building or trenching through a busy intersection, it quickly becomes unfeasible. Wireless solutions, in contrast, provide unparalleled flexibility. If the security network uses wireless infrastructure for connectivity, cameras need not be perma-

nently located next to the wired network connection. As necessary, cameras and subscriber units can be moved to a new location and can be reconnected within minutes. Carrier-class wireless solutions are available for even the most large scale deployments, and are available in ruggedized enclosures for deployment in all weather conditions. More economical solutions are also available for smaller, more budget - conscious deployments.

High Capacity

Video is a bandwidth intensive application and imposes stringent bandwidth requirements. Wired networks often do not scale quick enough to meet the growing bandwidth demand. Wireless equipment is available in capacities ranging from several Megabits to Gigabit rates, enabling quick build out of high capacity networks.

Mobile

The inherent un-tethered nature of wireless products simplifies deploying mobile systems. This includes the transporting of large amounts of data to vehicles for mobile video monitoring. This is achieved by deploying mobile subscriber units in law enforcement vehicles, which receive video from fixed base station units. As a result, police vehicles can view real-time streaming video surveillance of a crime scene as the drive to the scene, enabling them to be more prepared upon arrival.

Highly Reliable

High-end wireless systems support up to 99.999% availability, enabling virtually non-stop monitoring and surveillance. A wireless system with 99.999% availability has only 5 minutes of downtime in an entire year!

Outdoor Design

A large portion of security and surveillance systems today are deployed outdoors. Environmental conditions for security applications vary from sub-zero temperatures to the extreme heat of the desert, or from wet conditions to dry. Wind loading is a significant consideration for deployments in tropical and hurricane advisory regions, as well. Innovative wireless systems can overcome line of sight and hidden node challenges that plague many security and surveillance deployments. Wireless solutions that leverage a combination of point-to-point, point-to-multipoint and mesh topologies are better suited to overcome these challenges.

Key Development Considerations

Deploying a video system for security and surveillance utilizing wireless begins by assessing transport bandwidth requirements and a preliminary network design. The bandwidth required depends can vary considerably, and should be based on the specific requirements of each video application. In the case of simple video where a single video stream from a surveillance camera is being monitored remotely, minimal bandwidth is required. As additional cameras are added, transport bandwidth required increases. If additional video streams are used from each camera or server for archival recording purposes, or for viewing from secondary monitoring points, bandwidth required increases even further. All analog video streams must be encoded prior to transporting over the wireless network. The bandwidth of each video stream is dependent upon the video format, its resolution, compression level, and frame rate. Aggregate bandwidth requirement is simply the sum of all video streams at any given time.

In order to view real-time video applications, latency and jitter must be controlled. All application bandwidth and latency requirements must be assessed. Underlying protocols for video streams and end-to-end quality of service must be planned in advance.

Camera Type

Choosing the right camera is crucial to the success of any security and surveillance solution. There are a number of leading vendors that offer a wide range of camera for security and surveillance. Typically, applications determine the specific camera type you need, so be sure to ask each camera vendor how their cameras are specifically suited to handle the applications you choose to deploy. Specific

camera components that you will want to ask about include the lens, the type of optical filters, Web server compatibility, motion-sensing capabilities, and more.

Analog or Digital?

Analog video cameras still have a majority market share of the surveillance camera market. Existing analog video applications can be easily adapted for transport over a wireless network by using video encoders/video servers from any of the leading camera manufacturers. A video server typically has several analog ports for analog cameras to plug into, as well as an Ethernet port for connection to the network. Besides the video input, a video server may include other functions such as digital and audio inputs and outputs, ports for serial data, or controls for the pan/tilt/zoom of cameras and devices. Digital (or IP-based) video cameras eliminate the need for expensive encoders or servers required to digitize analog video streams. Digital video cameras offer more features such as remote access, management and upgradability, reducing the overall expenses for a lower total cost of operation. Digital video cameras form a significant and growing percentage of all new video surveillance systems. Market trends favor the eventual transition to all digital IP video cameras for security and surveillance applications.

Power Options

IP-cameras that support Power over Ethernet (PoE) reduce overall installation costs. With PoE, only one cable – a CAT-5 Ethernet cable – is required. Estimates of cost savings using PoE range from $500-$1,000 per port. However, PoE injectors or switches that support native PoE will be required in the network which may add $25-$60 per port. A new generation of camera uses solar power, eliminating the need for electrical power altogether. Solar power is portable,

has zero-emissions and has no recurring costs. These solar powered cameras are flexible and can be deployed virtually anywhere - golf courses, power plants, pipelines, highways, etc.

Application Considerations

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Network Type

The decision to deploy a dedicated network for security and surveillance or to use an existing or shared network must be made during the planning phase. Only video data and control traffic is transported over a dedicated security and surveillance network. This type of network will require dedicated wireless network with bridges, switches and routers that are connected to a high capacity backhaul optimized to handle video traffic. Locally video traffic is routed on to a video-specific network. Only when a viewer on a different network wants access to video from the cameras or archives is video traffic sent to the user over that network.

If there is enough spare capacity on an existing network, video cameras can be added to the existing network. The existing network will need to be optimized for the new video and existing applications with appropriate QoS classes.

Video Management Software

When designing a wireless solution for security and surveillance, it is important to select compatible video management software that matches the applications. Simple monitoring applications can be viewed directly on a Web browser such as Internet Explorer or Mozilla Firefox and may not require recording and archiving. Professional-grade security and surveillance systems require the ability to store, archive and retrieve images and video in real-time. This capability requires professional monitoring and recording software, which turns a video management server into a networked digital video recorder. All major camera manufacturers offer video server and management software in combination with the cameras. This software provides flexible viewing options and, more importantly, the ability to store and manage the video, with a digital video recorder. Dedicated software is installed onto a PC or server for monitoring, storing, replaying and conveniently managing video and images that offers a level of complete system functionality that is superior to any existing system on the market today. The software can be either a standalone solution for a single PC or a more advanced client/server-based system providing support for multiple simultaneous users. Choosing the right camera is crucial to the success of any security and surveillance solution. There are a number of leading vendors that offer a wide range of camera for security and surveillance. Typically, applications determine the specific camera type you need, so be sure to ask each camera vendor how their cameras are specifically suited to handle the applications you choose to deploy. Specific camera components that you will want to ask about include the lens, the type of optical filters, Web server compatibility, motion-sensing capabilities, and more. Market trends favor the eventual transition to all digital IP video cameras for security and surveillance applications.

Why Proxim

Proxim is a global pioneer of broadband wireless solutions, with significant experience in deploying wireless solutions for video applications. Proxim's products and service have helped thousands of customers worldwide to increase productivity, cut costs, and gain operational flexibility through advanced networking solutions. Proxim is an established market leader in WLAN, Wi-Fi mesh and point-to-point wireless systems.

Proven Product Portfolio

Proxim's Wi-Fi product lines are well suited for security and surveillance applications. Proxim's fixed and mobile products include the Tsunami™ MP 8000, MP.11 product series. Proxim's Wi-Fi product line includes the ORiNOCO® Wi-Fi product family. Proxim's Tsunami® 8000 product family comprises of robust, affordable base stations and subscriber stations for the 2.3-2.5 GHz and 4.9 to 5.9 GHz frequency bands .The 4.9 GHz licensed frequency band restricted for public safety (US only), allowing cost effective deployment of business class security and surveillance networks. The MP 8000 and MP.11 product can be installed virtually anywhere – across rugged terrain, over bodies of water, and in even the most remote areas. Deployments can be easily relocated and reconnected in minutes for both fixed distribution and mobile applications.

Proxim's Tsunami™ MP.11 HS (High-Security) line represents Proxim's "ultra-secure" line of products, and is a wireless product to combine support for multiple frequency bands, FIPS 140-2 level 2 compliance, AES-256 encryption, and secure management (SSH, HTTPS, and SNMPv3) in a single unit for a truly integrated solution. This product was designed specifically to handle bandwidth-intensive applications like wireless video surveillance, while also meeting or exceeding government requirements for wireless security. Though this product was designed to meet or exceed the security requirements of government organizations, the HS line of products are commercially available to all customers, providing all organizations the same access to government-grade wireless broadband security.

Proxim's ORiNOCO® AP-4000 dual-radio access points also support mesh with the flip of a switch for easier support of video surveillance applications. Recognizing the importance of delivering an enterprise class feature-rich mesh solution, the industry- leading ORiNOCO® dual radio access points are available with mesh functionality ensuring a truly reliable, secure and easy to deploy wireless network.

High Performance Products

Proxim's Tsunami™ MP 8000, MP.11 products support full mobility and fast handoffs at vehicular speed with session persistence. Customizable roaming parameters maintain minimum bandwidth required for application performance. Using OFDM technology and Wireless Outdoor Routing Protocol (WORP®), Tsunami® based networks dynamically adapt to the changing network load for optimum performance. WORP® adapts to avoid collisions and maximizes data throughput with each transmission. The dynamic data rate selection algorithm automatically compensates for temporary link degradation, maintaining robust connectivity and mitigating service calls.

Reliable, High-Bandwidth Networks

Tsunami™ MP 8000, MP.11 users need not worry about dropped packets that could interrupt surveillance. With 99.999% carrier class reliability, Tsunami™ MP 8000, MP.11 ensures continuous transmission of images in real-time. Designed to perform in harsh outdoor environments, MP 8000, MP.11 systems are virtually weather-proof. A key feature of the MP 8000, MP.11 products is high-bandwidth capability, which is required to transfer high-resolution video. With bandwidth scaling up to 300 Mbps per Base Station/Subscriber Unit, the Tsunami™ MP 8000, MP.11 is ideal for video applications. Organizations requiring robust security capabilities – such as enterprises and military bases – can choose from a complete line of point-to-point, multipoint and mesh solutions, including the ultra-secure MP.11 HS.

Best Values

Proxim's products enable cost-effective security deployments for use in protecting students on a university campus, safe- guarding national transportation infrastructures, or anything in between – by being able to connect surveillance cameras in places where running wires is either cost-prohibitive or impossible. Tsunami® based deployments cost about 50-75% lower than fiber for equivalent performance.

Rapid Deployment

Proxim's wireless solutions install in hours and provide unparalleled flexibility. As the security network uses wireless connectivity, the cameras are not permanently fixed in one location. If necessary, the camera and subscriber units can be moved to a new location at a moment's notice and reconnected within minutes.

Robust Quality of Service

Proxim's Quality of Service (QoS) provides reliable and adequate transmission quality for specific types of traffic (video or other) under conditions of high congestion while controlling latency and jitter for optimal performance. Proxim's non-contention based QoS is based on the IEEE 802.16 standard and defines classes, service flows, and packet identification rules for specific types of traffic. Users have the ability to create, edit, and delete classes of service that are specified by the QoS parameters, Packet Identification Rule (PIR), Service Flow class (SFC) and QoS class. A video deployment may have multiple service classes; for example,

 1) Down link – 1Mbps Video: Streaming Video; Priority: 2 2) Down link – 2Mbps Video: Surveillance Video; Priority: 1

Secure Connectivity

Multiple security mechanisms protect transmitted traffic to provide ultimate privacy. Proxim's Wireless Outdoor Routing Proto- col (WORP®) supports secure long-range wireless deployments. MP products support mutual authentication, packet filtering, RADIUS authentication and secure all over the air transmissions. WORP® prevents snooping common to Wi-Fi systems, so popular hacking tools such as Netstumbler cannot decode Tsunami® packets.

Enables a Wide Range of Applications

Proxim's wireless networks are actively being used for a wide range of security and surveillance applications across the world, including:

• Monitoring assets
• Traffic monitoring and control
• Public area surveillance
• Virtual hall monitors
• Perimeter security
• Securing sensitive areas
• Law enforcement
• Border patrol and anti-terrorist surveillance

Conclusions

The growing demand for robust, cost-effective security and surveillance systems by government organizations and enterprises alike continue to present significant revenue opportunities for systems integrators. The large amount of video traffic generated by security and surveillance applications requires flexible IP-based wireless connectivity and transport solutions for cost-effective and robust delivery. Proxim's wireless solutions for security and surveillance provide unparalleled flexibility, are cost-effective and can be deployed in a matter of hours and days. Proxim's market leading wireless solutions enable system integrators to deploy security and surveillance systems leveraging both existing analog video deployments and new IP-based digital video systems. Combining Proxim's ultrasecure wireless solutions with the benefits of a video surveillance system provides unmatched performance, cost, and availability for today's demanding security and surveillance networks.

Proxim Wireless Products for Security and Surveillance
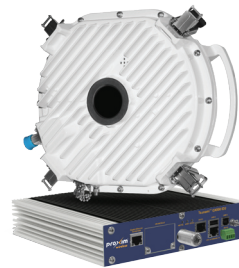
Tsunami® 8200 Series
4.9 - 5.9GHz
300Mbps
25.8 dBm
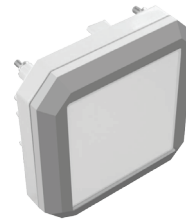
Tsunami® QB-62000 Series
57 to 64GHz
2Gbps
9 dBm

Tsunami® 8100 Series
2.3 - 6GHz
300Mbps
21 dBm

Tsunami® GX800 Series
6-23GHz
622Mbps
27 dBm

Tsunami® .11 Series
4.95 - 5.85GHz
54Mbps

ORiNOCO® Series
802.11a,b,g,n dual radio
320Mbps
19.5 dBm

About Proxim

Proxim Wireless Corporation (OTC Markets: PRXM) provides Wi-Fi®, Point-to-Point and Point-to-Multipoint 4G wireless network technologies for wireless internet, video surveillance and backhaul applications. Our ORiNOCO® and Tsunami® product lines are sold to service providers, governments and enterprises with over 2 million devices shipped to over 250,000 customers in over 65 countries worldwide. Proxim is ISO 9001-2008 certified. For more information, visit www.proxim.com. For investor relations information, e-mail ir@proxim.com or call **+1 413-584-1425.**

Proxim_WP_Security & Surveillance

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