Application Note

Wired And Wireless

Introduction

Despite the massive number of deployments of wireless based networks to support a wide variety of mission critical applications, concerns are often raised on the benefits and performance of wireless based networks as compared to wired networks. This application note addresses these common concerns via an FAQ format and explores the advantages of wireless based solutions. We focus on a video surveillance application for comparison.

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Common concerns and questions on wireless infrastructure

Can wireless devices support bandwidth intensive applications?

With the latest radio innovations like 802.11ac, today wireless products can provide over 1Gbps data rates in aggragate, whereas even the most advanced applications such as HD video surveillance cameras require about 20Mbps. This means a single wireless channel, Access Point or Base Station can support literally dozens of Full motion HD cameras in a given area.

Can wireless like wired-like offer low latency and jitter?

While we acknowledge that in terms of delay and jitter control wireless products while excellent can not match wired performance. However given that voice and video applications only require latency under50ms and jitter below 3 ms for seamless video feeds, wireless networks with the right MAC protocol such as WORP can meet these specs easily.

Is wireless reliable?

Most available systems are designed for 99.999 percent uptime – translating into just over five minutes of downtime during a one-year period. A system can be configured for 100 percent availability using redundant hardware.

Is the information secure over the air?

It is very common in today's wireless networks to supportAES-128 or Advanced Encryption Standard. Ratified by the National Institute of Standards and Technology, it is a secure 128 bit key standard, which means that it would take 2128 operations or 340, 282, 366, 920, 938, 463, 46 3,374,607,431,768,211,456 turns to decipher the message for an unauthorized user which is widely known to be out of reach even for the contemporary computing techniques. PHY layer encryption is only the beginning of a list of security measures implemented in a well designed and properly deployed wireless network. Standard 802.1x, EAP, VPNs, MAC layer authentication x.509 device certification are all available and sued in wireless networks.

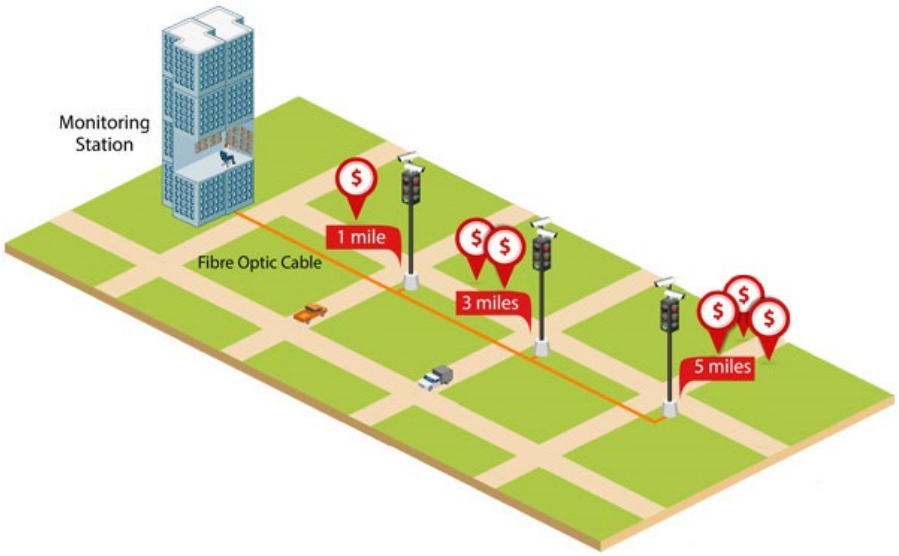
How hard is it to deploy?

One of the key benfits for wireless networks is they can be deployed in a matter of days. With proper up front design and planning, a 40 camera network for example, was recently deployed and up and running inside of a week.

Total Cost of Ownership

Fiber based networks cost significantly more to deploy than an equivalent wireless system, often about 5x-10x more. Deploying other wireline networks is as expensive as fiber networks 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.

Wired Video Surveillance Cost Estimation



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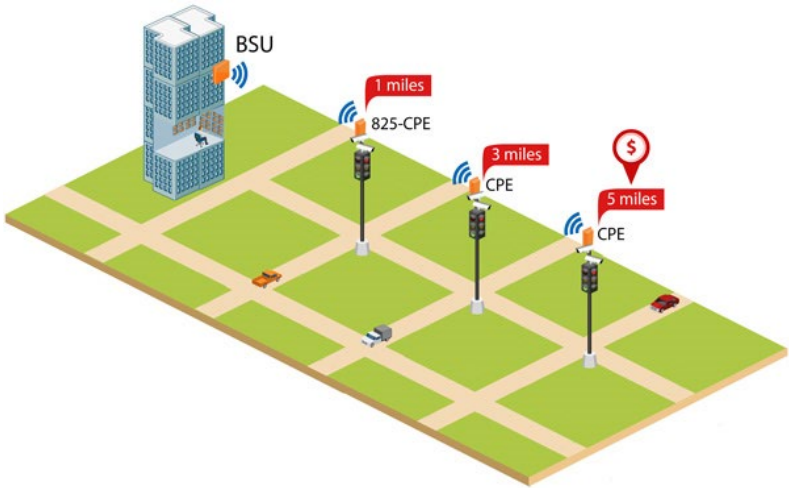
WIRED COST ESTIMATION				
Distance	Network Elements	Quantity	Cost	Total Cost
1 Mile	Fiber Optic	1 Mile	$732	$35,357
	Media Converter	2	$1,190	
	8 Port Managed Switch	1	$165	
	Trenching	1 Mile	$33,270	
3 Miles	Fiber Optic	3 Mile	$6,400	$107,202
	Media Converter	2	$1,190	
	8 Port Managed Switch	1	$165	
	Trenching	3 Mile	$99,447	
5 Miles	Fiber Optic	5 Miles	$6,400	$173,378
	Media Converter	2	$1,190	
	8 Port Managed Switch	1	$165	
	Trenching	5 Miles	$165,623	

Proxim's Wireless Video Surveillance Cost Estimation



WIRELESS COST ESTIMATION				
Distance	Network Elements	Quantity	Cost	Total Cost
Upto 5 Miles	Base Station Unit	1	$ 4000	$ 11,485
	Subscriber Unit	3*	$ 1290	
	Sector Antenna	1	$ 700	
	Installation Services	-	$ 5000	
	8 Port Managed Switch	3*	$ 495	

Note: * One Managed Switch, Subscriber Unit on each pole

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Summary

Historicaly wired networks always had higher capacity when compared to a single channel of wireless. Older generations of wireless networks could cost several thousands of dollars for each box or end unit.. This situation, however, has changed remarkably in the past few years with the continuing high rate of innovation in wireless technologies, components, products, , standards and, tools,. In short, the price/performance of wireless is now more than competitive with wired solutions in the majority of installations and applications.

Below is a summary table of key benefits and differences of wire vs. wireless based solutions.

Key Factors of Fibre vs Wireless

Key Factors	Fiber	Wireless
CAPEX & OPEX	High cost installation and maintenance	Lower cost of installation, simpler maintenance
Deployments	Slow deployments	Faster deployments: some can be deployed in just a matter of hours as opposed to weeks and months
ROI	ROI acheived at a snails pace	RoI can be accheived in liss than 6 months
Scalability	Scalability is a limitation in rural/remote areas, as well as in densely populated metro environments	Scalability is an advantage for wireless as it can be installed anywhere irrespective of geographical constraints
Organizational Demands	Fiber is not as cost-effective in most backhaul scenarios	Wireless enables quick & economic backhaul depending on customized needs from small to large deployments
Roll Out	Vulnerable to physical damage, where repairs required high labour proficiency and very high costs	Physical damage could occur at the antenna or wiring sites, but can easily be replaced to quickly repair the link
Added Advantage	Cannot carry electrical power to operate terminal devices	Wireless backhaul deployments are capable of powering terminal devices

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Company Profile

Proxim Wireless: Performance Matters. Proxim Delivers.

Proxim Wireless is a pioneer and global leader in advanced Wi-Fi, point to point, and point to multipoint outdoor wireless systems that are purpose built for mission critical and high availability communications. With over 30 years of wireless experience, Proxim is recognized for its unparalleled reliability, superior performance and drive for innovation.

Products and Markets

Marketed under the ORiNOCO® and Tsunami® brands, Proxim provides a comprehensive product line for a wide variety of market segments including enterprises, service providers, carriers, governments and municipalities, Wi-Fi Operators/Hot spot Operators and other organizations that need high performance, secure scalable wireless solutions.

Go to Market

Proxim serves customers through a global network of distributors, value-added resellers, system integrators and original equipment manufacturers. Our strong internal sales force also engages in direct-touch, consultative selling with major customers regardless of whether fulfillment is direct or via a channel partner. Our experienced system engineering team is available to provide professional services to both our channel partners and end customers.

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