Solutions Guide

IP Security and Surveillance

Allied Telesis Enhanced IP Camera Video Surveillance Solutions

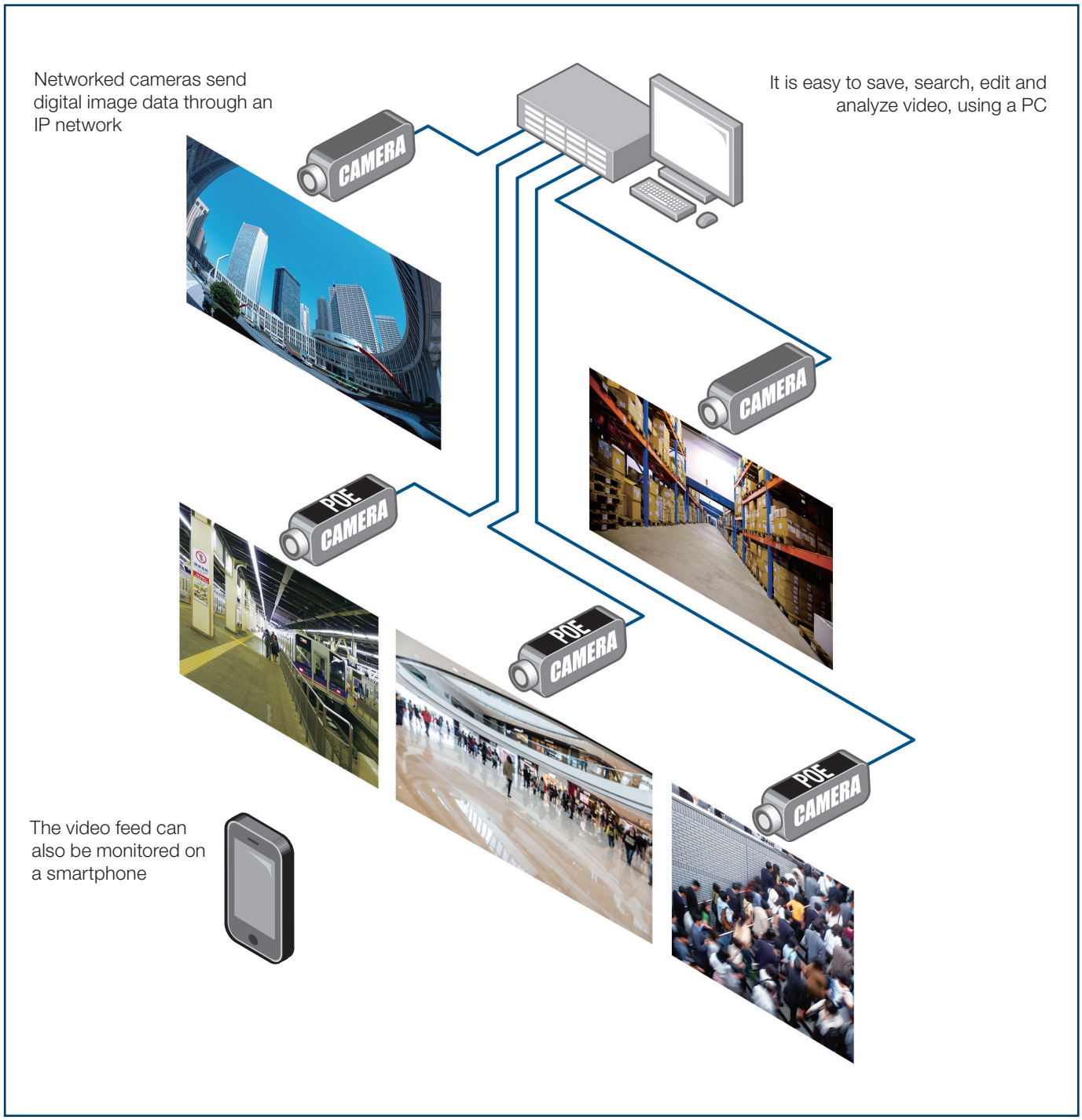
IP Video Surveillance

Introduction

With the evolution of CCTV technology, the emphasis has moved from simple monitoring of video footage, to today's intelligent systems that are capable of identifying abnormal events or behavior.

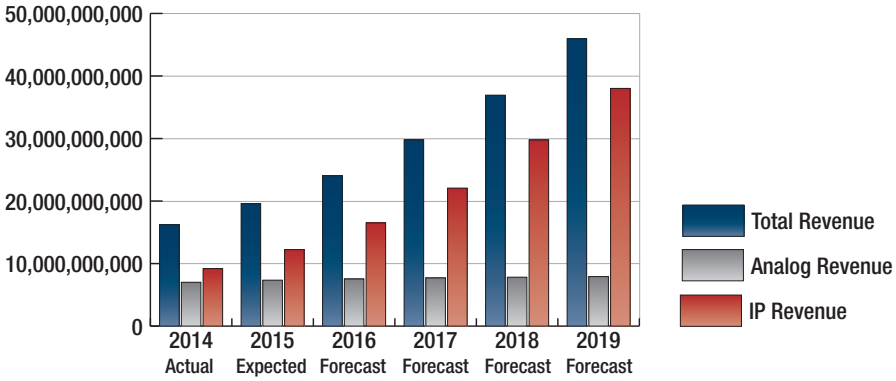
As intelligence increases in these systems, so too do the applications for this technology. Surveillance technology can now be used to observe consumer behavior in a retail environment and help organizations to increase revenue and profitability, while at the same time monitoring a store to reduce shrinkage.

This document explains some of the benefits of "intelligence" in IP surveillance systems, and the advantages of working with Allied Telesis IP video surveillance solutions.



IP camera usage has grown rapidly

There has been a rapid transition from using analog cameras to using IP cameras. This has been driven by IP cameras' advanced features and ease of use. As the production of IP cameras has increased, the prices have decreased. The trend towards using IP cameras will certainly continue, both in the expansion of existing surveillance systems, and in the installation of new surveillance systems.



Source: Technavio Global Video Surveillance Market 2015-2019

Advantages of digital camera systems

- High definition images that do not degrade, and can be analyzed by software.
- Greater efficiency, as standard monitoring tasks can be automated by video analytics software.
- Reduced construction costs, due to simpler installation and cabling.
- Enhanced image distribution and system scalability.

Technology Brief

Digital video surveillance growth

Numerous factors have led to a growth in digital video surveillance, including the following:

- **The end of analog-based broadcasting**

Most of the world is moving from analog to digital broadcasting. Digital video provides higher resolution images.

- **Convergence into IP networking**

IP is becoming a universal communication medium. It is used for telephony, video conferencing and TV distribution.

- **Video analytics**

Video analytics is the ability to automatically analyze video data, to detect and determine temporal and spatial events. This is one of the key reasons for digital video growth.

- **Technical improvements in surveillance cameras**

As the reliability, image resolution and video analysis capabilities of surveillance systems improve, the demand for these high-end features continues to grow.

The following table contains at a glance comparisons between analog and IP cameras:

	COMPARISON FACTORS	IP CAMERAS	ANALOG CAMERAS*
CAMERAS	Functionality	High, and growing	Low, not improving
	Price	Decreasing rapidly	Slowly decreasing
IMAGE QUALITY	Resolution	High, and improving	Low, not improving
	Degradation	Negligible	Significant
VIDEO STORAGE	Storage medium	NVR/PC/HDD	VCR (video tape)
	Save/check/control remotely	Yes	No

*Without analog-to-digital conversion

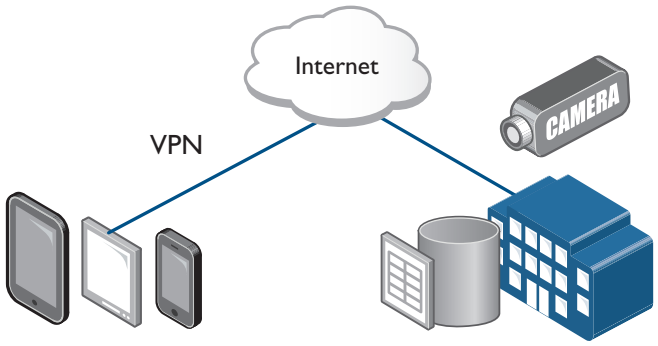
The Major Advantages of IP Cameras

High definition images

High definition digital images are sharper and clearer than the lower resolution images typically produced by analog surveillance cameras.

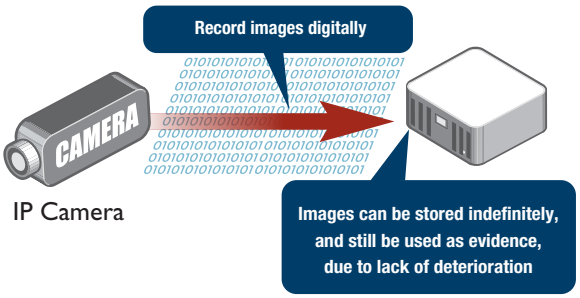
Digital video can be stored on a variety of media—PC hard drives, Network-Attached Storage (NAS) systems, and more. Digital images do not degrade, regardless of how long they are stored. Furthermore, they can be searched quickly, even if large volumes of data have been stored.

Remote monitoring by smartphone

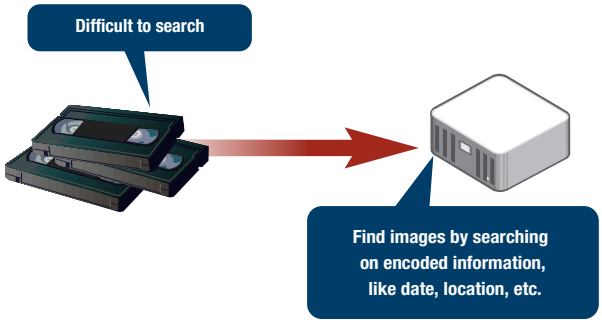


Video feeds can be monitored remotely from anywhere, using a smartphone or tablet, with a suitable App.

Long-term storage without deterioration



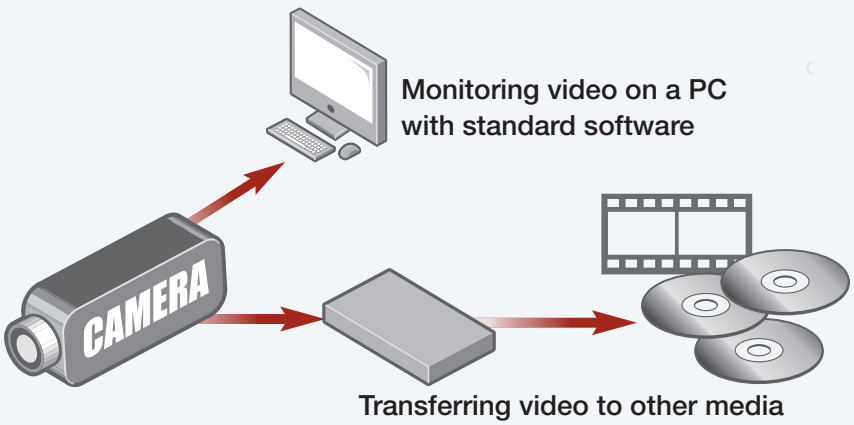
Improved search capabilities



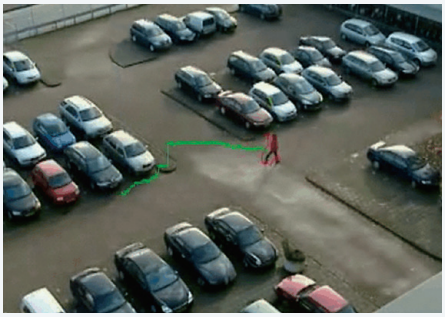
Simpler operation

Depending on the system, it is possible to monitor the digital video feed by using standard PC software.

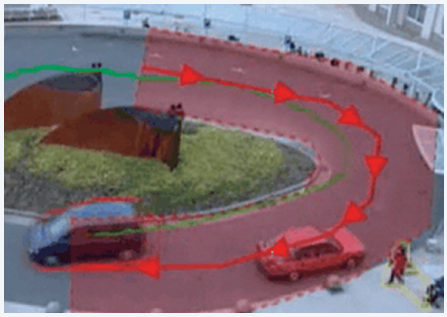
The images are stored as MPEG or H.264, so selected video segments can be written to a DVD or USB stick for simple transport, display, or to be analyzed.



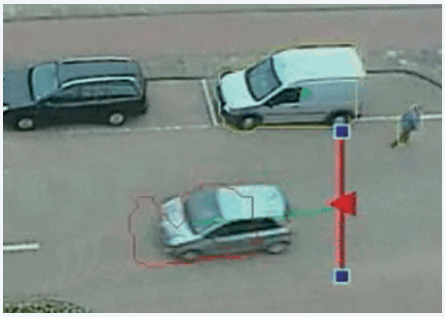
Detecting unexpected objects



Path tracking



Line crossing

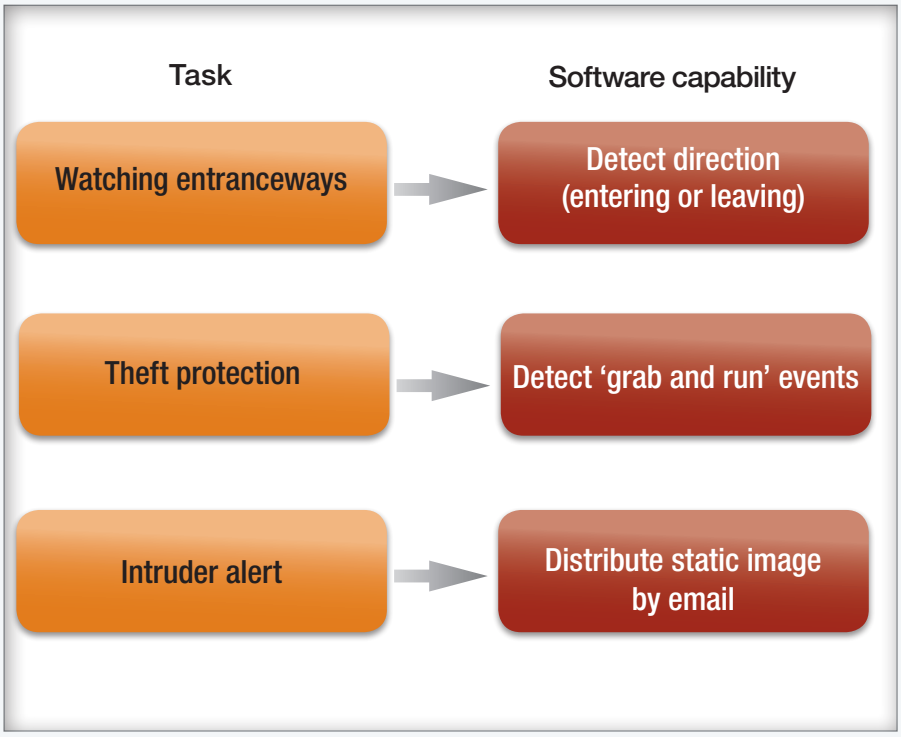


Unattended packages

Video analytics

Video analytics software is now achieving a high level of accuracy. A number of systems are available for different types of automated video monitoring and analysis.

Different video analytics software can be chosen for different purposes. A variety of mundane monitoring tasks can be automated, with a low rate of errors.

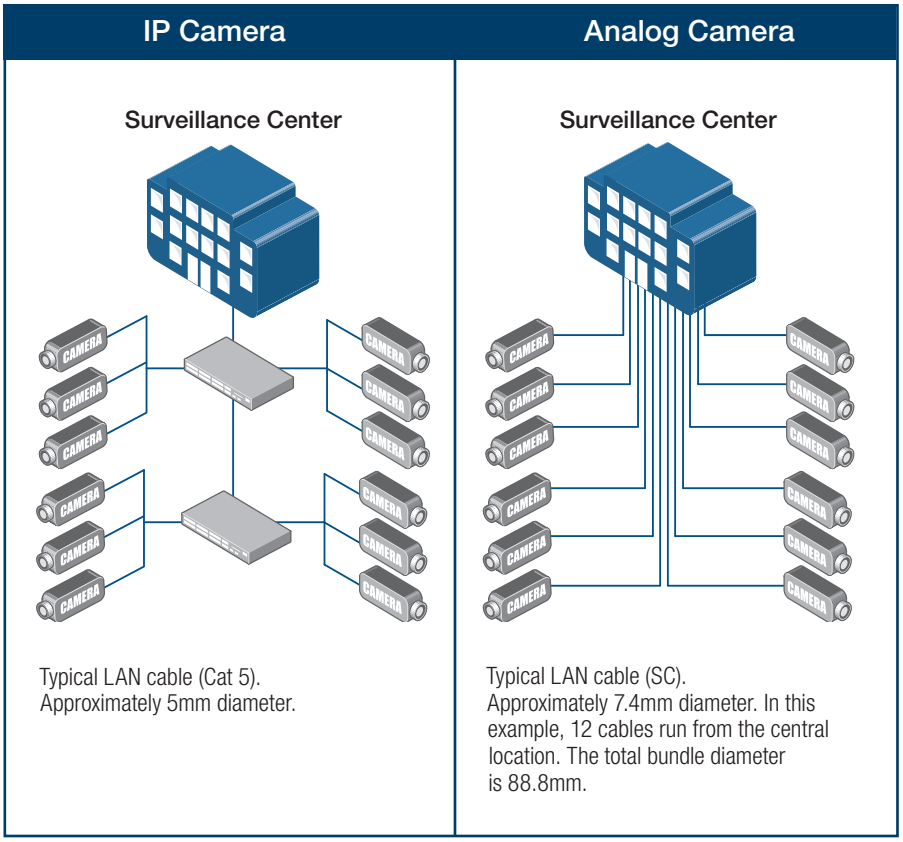


Simple installation and cabling

By using Allied Telesis Power over Ethernet (PoE) switches, power can be provided to cameras without needing specific power supply cables to them. The camera needs just a single UTP Ethernet cable run to it from its local switch. This simplifies the installation process.

As a result, even after the initial installation of the system is complete, any subsequent alteration or expansion of the surveillance network is also simplified.

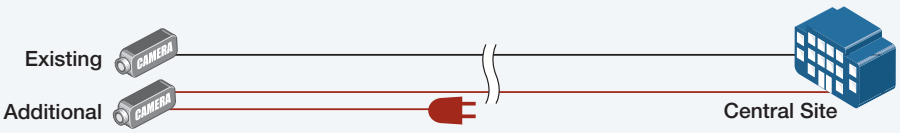
PoE-capable cameras must be used to take advantage of this benefit.



Simple alterations or extensions of the surveillance system

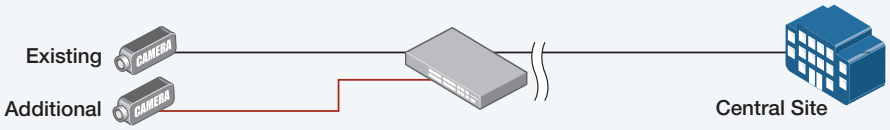
Previously, when installing additional analog cameras:

- New centrally located coax cabling needed to be run, with a power supply to each camera.
- New layouts were difficult and time consuming.



Now, changes to a LAN-like infrastructure are simple:

LAN cable is connected to the nearest switch and does not need to go all the way back to the central site. If a PoE switch is used, a separate power supply to the camera* is not needed.



* Requires PoE Camera

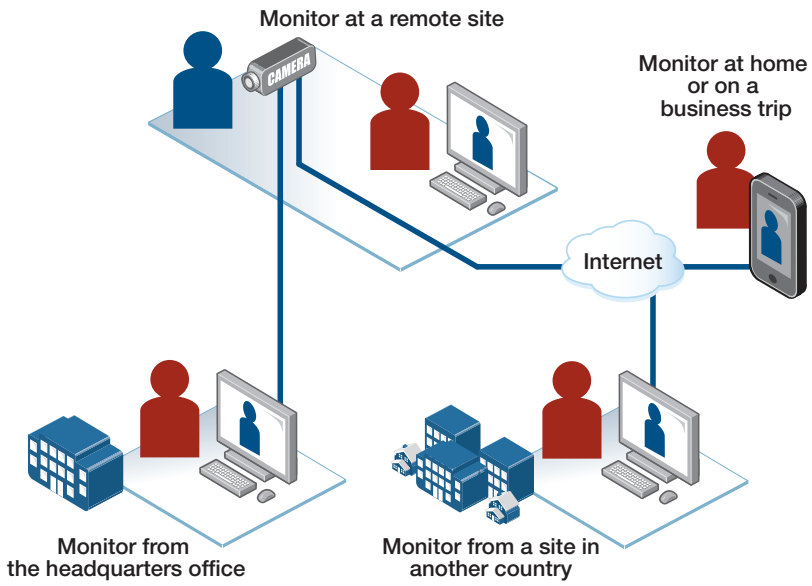
Easy distribution and system scalability

Video feeds from IP cameras can be monitored from remote sites. Additionally, the feeds can be transmitted across the Internet to locations outside the business. The feeds can also be viewed upon multiple displays or devices simultaneously.

Through integration with the existing Ethernet/IP network, the operation of the surveillance network can be incorporated in an organization's IT environment. IP networks are easily scaled to cope with the addition of new cameras. The organization can take advantage of the benefits that come from multiple applications (such as CCTV) being converged onto a single, unified network.

Remote Access

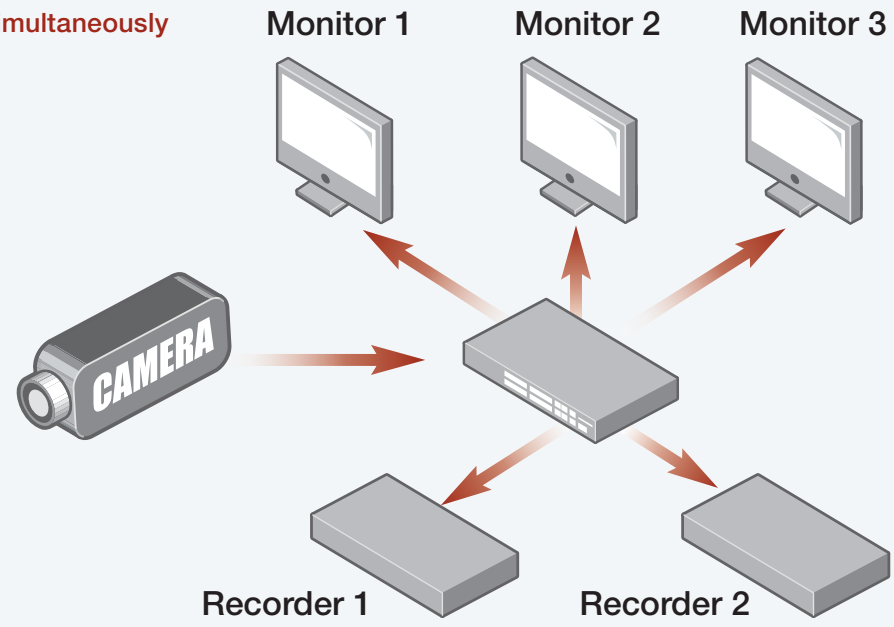
Once IP cameras are connected, monitoring can be performed from anywhere.



Deliver video to multiple receivers simultaneously

IP data streams can deliver video to multiple devices at the same time. This enables redundant storage of video. There is no limit to the number and locations of recording and monitoring devices.

Multicast communication enables efficient image distribution to multiple devices.



The Scope of IP Cameras

IP cameras are being used in more locations and for a broader range of applications

As IP networks become increasingly prevalent, IP cameras are replacing analog cameras and being deployed into new places for new uses. Powerful, specialized software applications are enabling IP cameras to improve security, and perform continuous monitoring with automated efficiency.

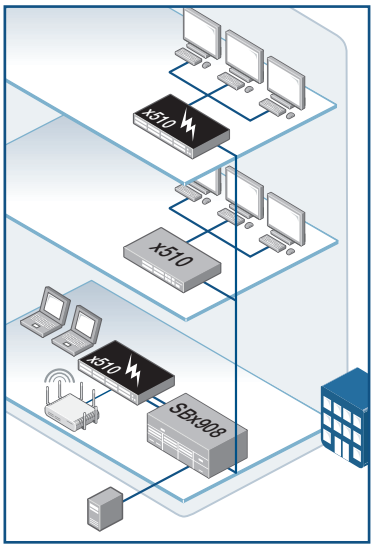
In addition, value is being added through marketing and increased customer service. The ways that people can interact with the surveillance system are diversifying, with the ability to connect via web portals and mobile devices.

Office building

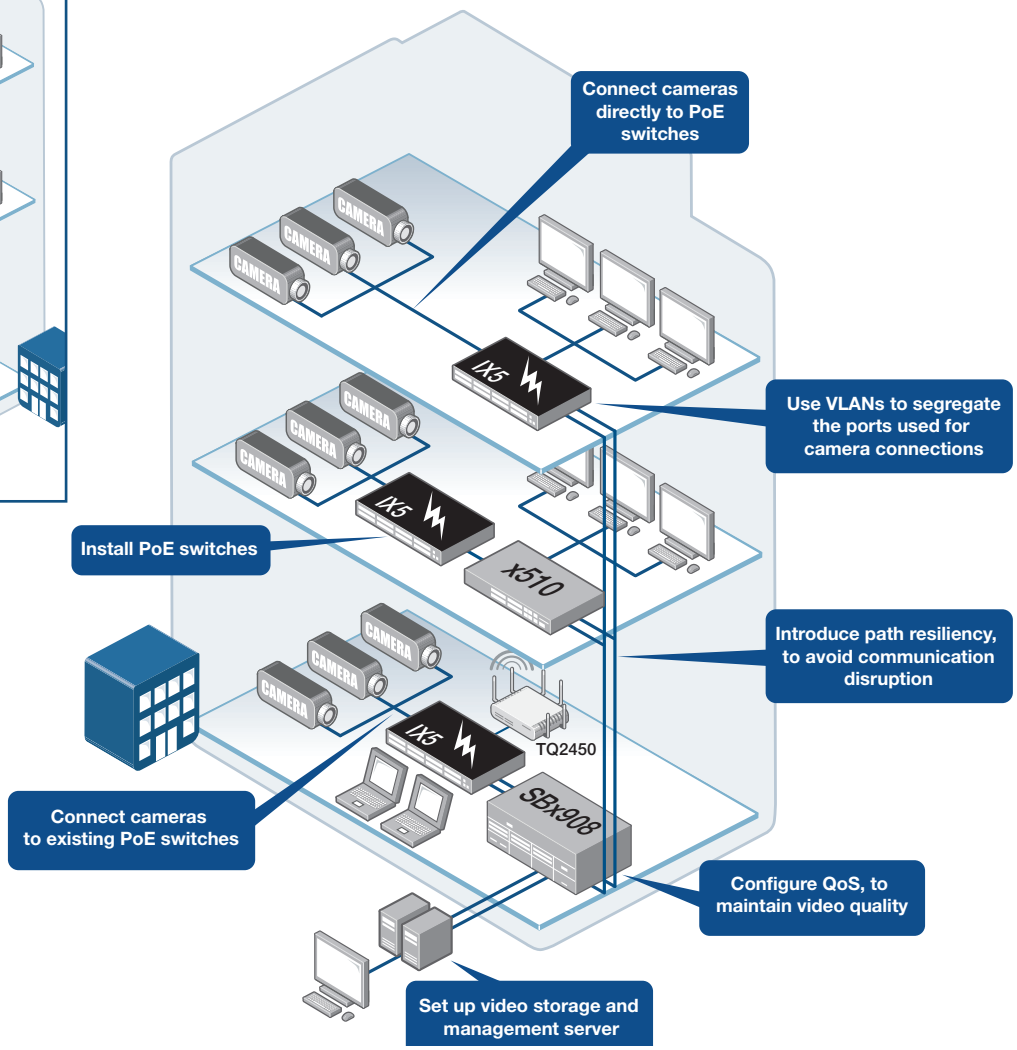
One aspect of the broadening use of IP cameras is the deployment for building management purposes. This application poses some challenges in terms of integration with existing networks, and cost-effective network construction.

The following “Before Installation” and “After Installation” diagrams illustrate best practices to follow when integrating video surveillance into an existing network. Taking advantage of IP cameras and following these integration practices enables a surveillance system to be added to an office building quickly and efficiently.

Before Installation



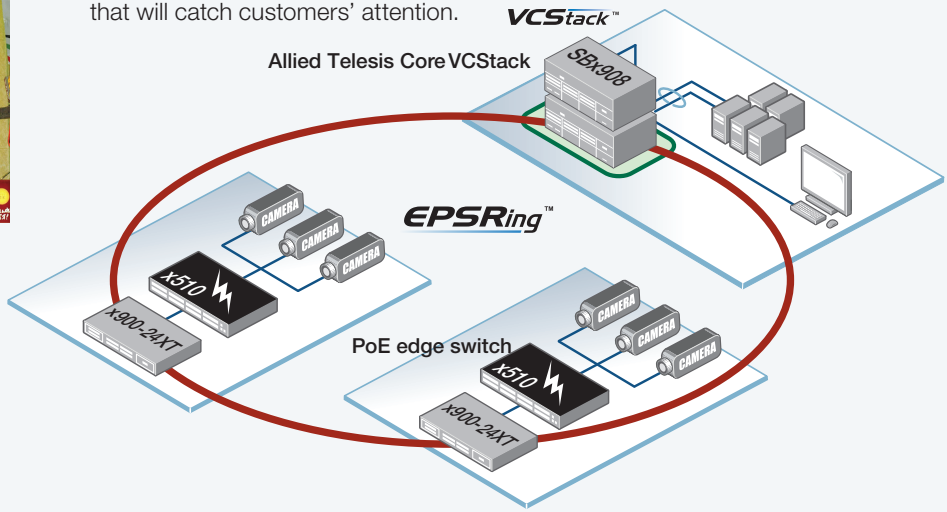
After Installation



Shopping Mall/Shopping Center

IP cameras in each zone can perform integrated surveillance. The need for security guard patrols is thereby reduced, while security and safety are enhanced. Facial recognition software is effective in the identification of suspicious individuals and shoplifters.

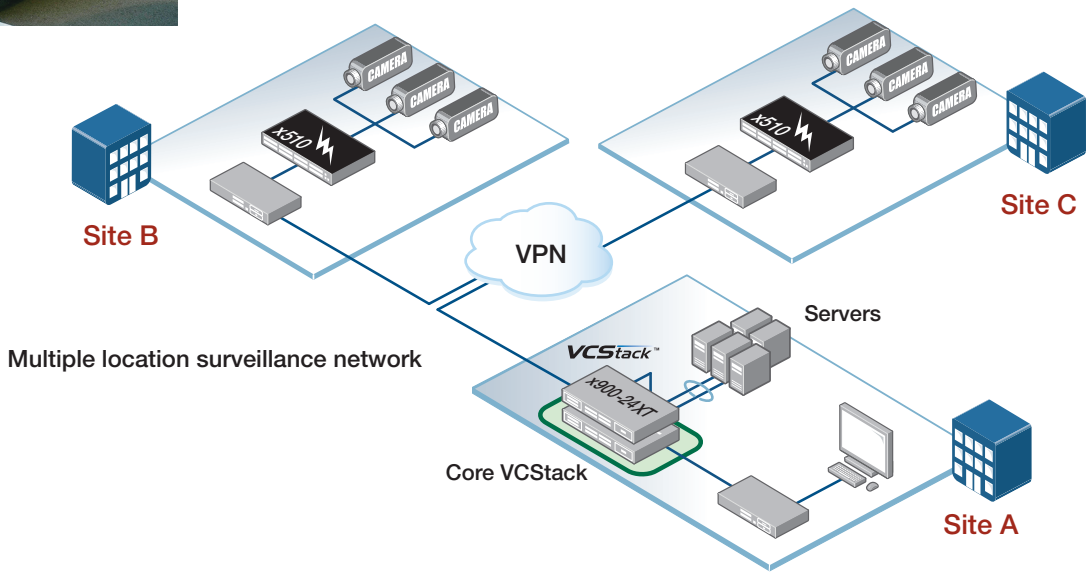
IP cameras can deliver video to screens to display live events, promotional announcements and messages that will catch customers' attention.



Chain Store/Parking

Integrated surveillance is an ideal security solution for parking areas and for stores with multiple locations. The high definition images provide a clear advantage, because large areas can be covered with fewer cameras. Software applications enable automatic detection of suspicious events. Intruder alerts can be raised automatically, working in parallel with other crime-prevention systems.

Pan, Tilt and Zoom (PTZ) camera control is operated remotely, enabling thorough surveillance coverage from a central location.



Hotel

Most hotels have IP networks throughout the buildings providing Internet access for guests. Integrating the IP surveillance system with the existing well-distributed network saves on installation costs.

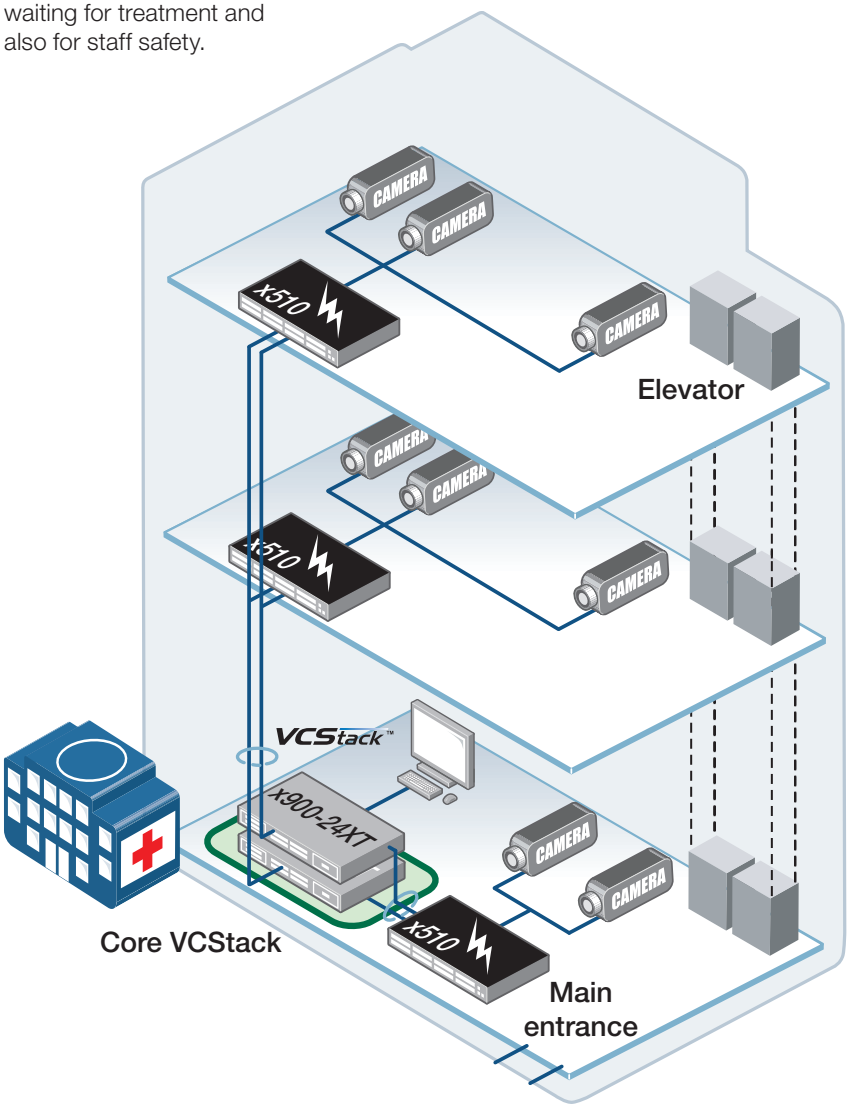
Warehouse/Factory

High resolution video surveillance prevents the theft of equipment and valuable goods. For those facilities that wish to attain TAPA certification (a freight security standard), it is essential to install and use IP camera surveillance systems. IP surveillance also helps to monitor the safety of staff in potentially dangerous environments, and pre-empt events that could lead to accidents.

Hospital

Opportunities for crime are significantly reduced by installing cameras to monitor entrances, elevators, parking areas, etc. The surveillance can be used in conjunction with ID authentication to control access to restricted areas.

Surveillance can be used to monitor the welfare of patients waiting for treatment and also for staff safety.

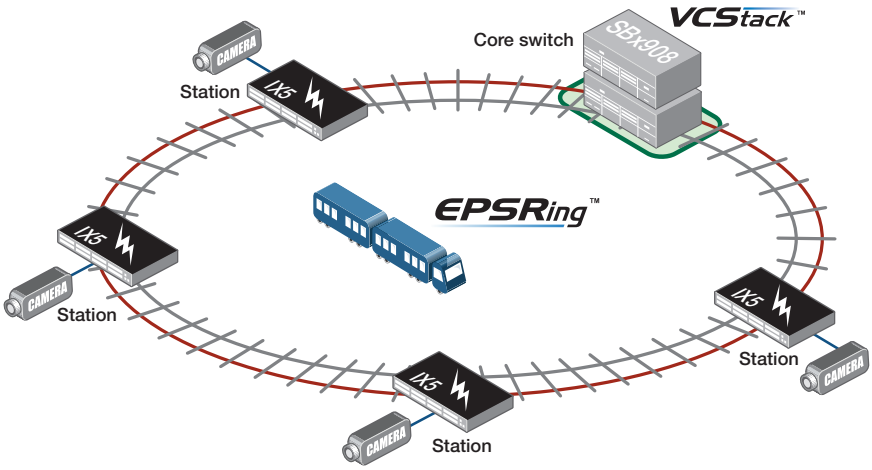


The camera network uses resilient pairs of links from an Allied Telesis Virtual Chassis Stack™ (VCStack) in the core to the distribution switches. This enables the network to continue operating, even if links or switches go down. In the security control center, the surveillance monitors receive video feed from each camera, enabling security guards to maintain real-time surveillance of the entire hospital. Cameras help prevent crime for the hospital by monitoring all entrances, exits, and elevator doors. It is important to install cameras in positions that do not have blind spots.

Railway/Superhighway

IP cameras can be connected into the network infrastructure that already exists along railways. The cameras can provide surveillance throughout stations, in unmanned stations, in electrical substations, and more.

Alarms can be raised when passengers are seen entering restricted areas. The networks along railways and highways cover long distances and are well suited to a ring topology. Using a ring design reduces the amount of cabling and switching equipment required.



IP surveillance supports crime prevention by placing cameras throughout stations. This provides a safety and security service to passengers. Cameras are installed at points along the railroad to remotely monitor signals and check track settings at junctions. These cameras also help prevent vandalism and theft crimes, and can provide an early warning of fires. In areas where onsite security surveillance is difficult, such as at unmanned stations, the installation of IP cameras enables remote monitoring. Installed screens display the images being fed from the IP cameras, and perform real-time surveillance using human eyes.

Disaster warning

Municipal and regional authorities are evaluating the installation of IP cameras to monitor river levels, and provide early warning of floods and other disasters. IP surveillance networks are an important tool for increasing the safety and security of populated areas.

School/Kindergarten/ Nursery School

Many countries are encouraging the use of Information and Communications Technology (ICT) equipment in schools. Therefore, the majority of schools in these countries already have IP networks in place. It is simple to attach IP cameras to the network to provide surveillance of school gates, rooftops and parking areas.

Parents can check on the welfare of their children at a preschool or kindergarten by connecting to the surveillance network via PC or smartphone, using a secure login.

Allied Telesis solutions are customized to suit the specific needs of each installation

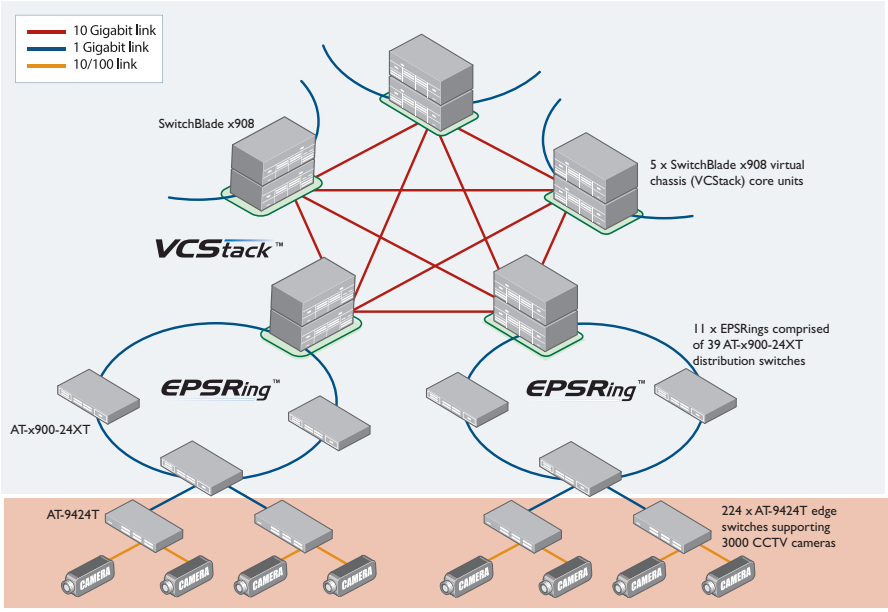
Allied Telesis is an equipment vendor and networking specialist that provides highly reliable networks, and Allied Telesis IP surveillance solutions have been deployed globally. Allied Telesis creates solutions that satisfy customer requirements, and focuses on expanding these solutions to more locations and a broader range of applications. The following are some high profile IP surveillance network success stories.

Success Story | Bangkok Metropolitian Administration

Traffic monitoring system based on IP cameras

Bangkok, the capital of Thailand, with a population of nine million, is a truly international city within this fast-developing Asian region. The Bangkok Metropolitan Administration (BMA) has overall jurisdiction for administration and public infrastructure in the municipal area, which is comprised of 50 separate local authorities.

BMA selected the Allied Telesis solution for their traffic management system. The traffic management system is an important part of their ongoing development of the city's infrastructure, and works hand-in-hand with the improvements in public transportation and upgrading safety management systems.



* Products shown in the diagram are only representative and may differ from those actually used.

Challenge

To install a reliable IP traffic surveillance system that covers the entire Bangkok metropolitan area.

Requirements

- High bandwidth
- Consistent high performance
- Resilient to link and unit failure

Key criteria in selecting Allied Telesis

- Highly reliable Gigabit switches
- Excellent multicast IP
- Resilient ring-based network design

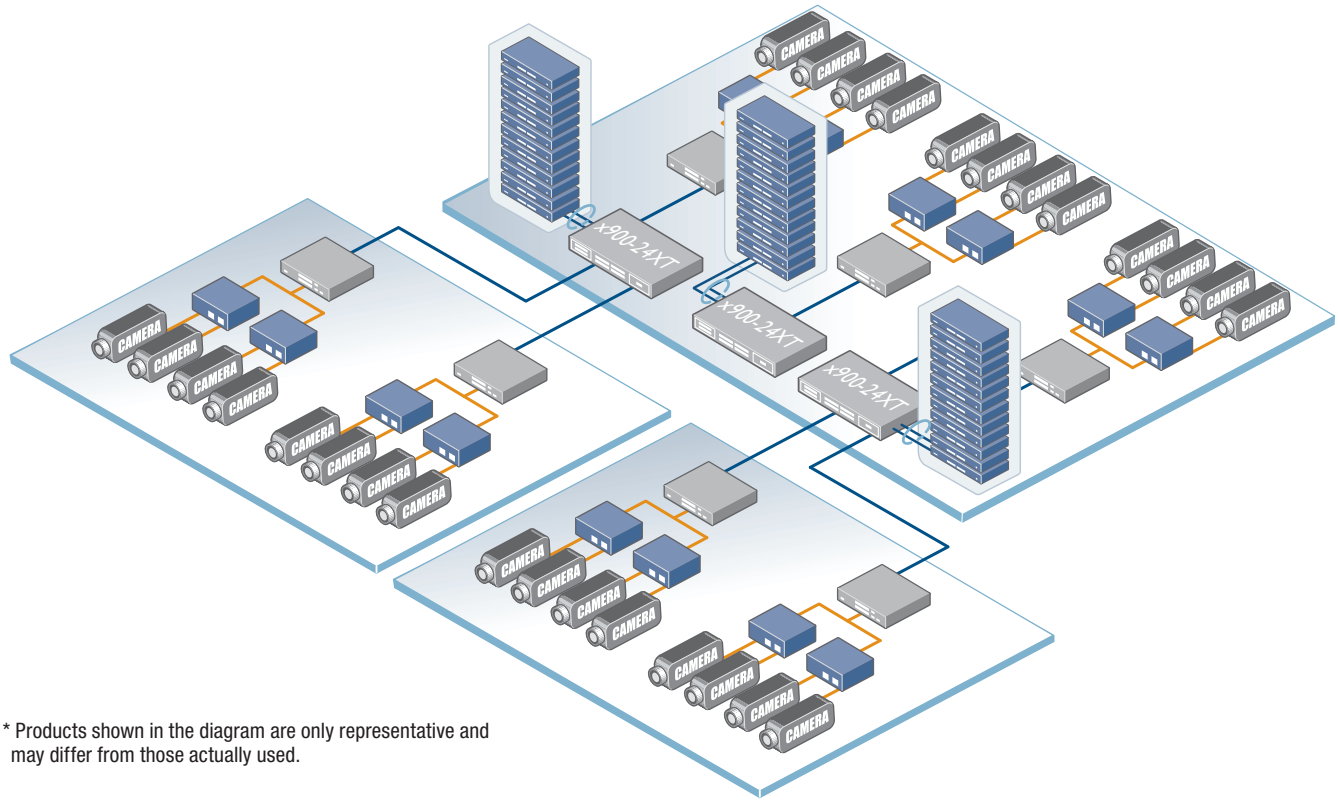
Benefits provided by the system

With this surveillance system installed, and running continuously 24/7, the city is able to deal more effectively with the daily traffic congestion. The city's five-year development plan includes a "Healthy City Development" guideline, developed by the World Health Organization (WHO). Part of the guideline is the implementation of a system to "Receive real-time images and information from all areas of Bangkok." The advanced IP surveillance system helps Bangkok achieve this goal.

Success Story | Mori Building Co. Ltd

Building a surveillance system in Roppongi Hills

Video surveillance is an essential component of the safety and security system of Roppongi Hills, the largest self-contained urban community in Japan. Mori Tower, the 54-story centerpiece of Roppongi Hills, is secured with about 600 surveillance cameras, transmitting video feeds over a dedicated Gigabit network. Uninterrupted transmission of high definition surveillance video 24/7 requires a high-bandwidth, high-reliability network, but at a reasonable cost.



* Products shown in the diagram are only representative and may differ from those actually used.

Challenge

To provide a highly reliable building surveillance network, which supports around 600 cameras and carries high volumes of video data.

Requirements

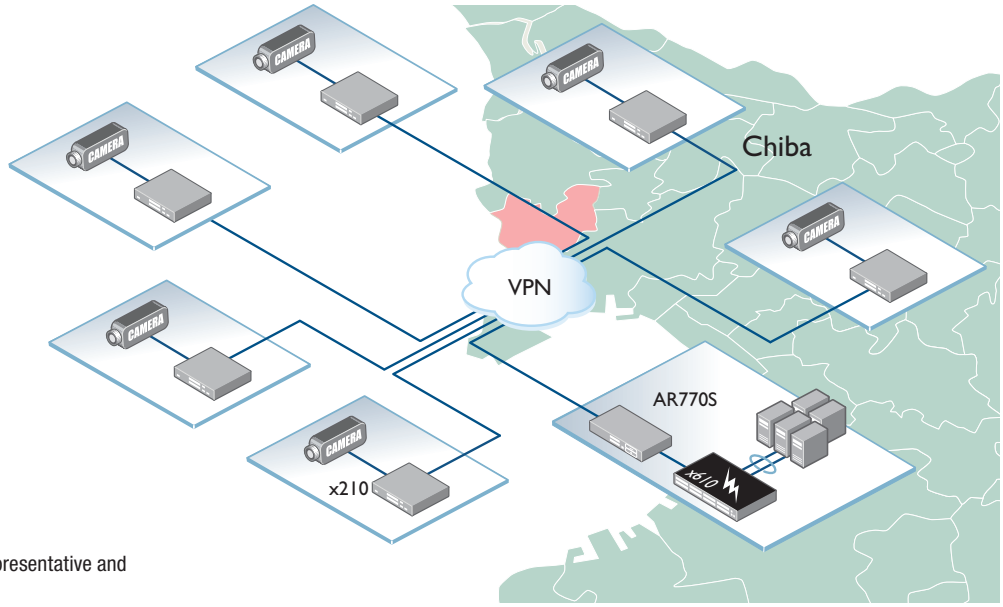
- Reliable operation 24/7
- High bandwidth
- Affordable cost
- Robust performance

Key criteria in selecting Allied Telesis

Allied Telesis x900 Series switches, provide high performance, reliability, and are easily managed—all at an affordable price.

Success Story | Ichikawa City Municipality in Chiba Prefecture

Security camera network in the streets



* Products shown in the diagram are representative and may differ from those actually used.

The Ichikawa City Municipality in Japan set a high priority on creating a safe and secure urban environment. It also has a drive to enhance administration services by utilizing Information and Communication Technologies (ICT). The municipal administration installed 500 security cameras throughout the city to help prevent crime, and reverse the citizens' perception of deteriorating safety.

An Allied Telesis VPN solution is used to connect remote cameras to the central video servers.

Challenge

Create a highly reliable VPN network to support approximately 150 cameras in various locations around the city.

Requirements

- Uninterrupted video feeds
- Secure data

Key criteria in selecting Allied Telesis

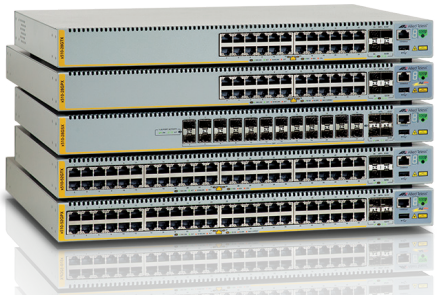
- Highly reliable and feature-rich VPN equipment

Featured Products

SwitchBlade® x908

Advanced Layer 3+ Modular Switches

The Allied Telesis SwitchBlade x908 advanced Layer 3 modular switch offers high flexibility and density in a small physical size. It provides scalable and versatile switching solutions for today's data center networks. Each chassis supports up to eight high-speed 60Gbps expansion bays, and is also capable of being stacked.



x510 Series

Stackable Gigabit Switches

The Allied Telesis x510 Series of stackable Gigabit switches includes a full range of security and resiliency features, coupled with easy management, making them the ideal choice for network access applications. The x510 Series is available in 24-and 48-port versions with optional 10 Gigabit uplinks and PoE+ ports. Up to four units may be stacked with VCStack, using fiber for long-distance stacking.

IX5-28GPX

High Availability, High Powered Video Surveillance PoE Switch

The Allied Telesis AT-IX5-28GPX is designed for high availability video surveillance applications, featuring dual hot-swappable power supplies, 1/10 Gigabit uplinks and extended temperature range. Supporting the full 30 Watts of PoE+ on all 24 ports simultaneously allows the IX5 to power the latest PTZ (Pan, Tilt, and Zoom) cameras. The AT-IX5-28GPX offers an impressive set of features in a high-value package, making it ideal for IP video surveillance applications.

x900 12 & 24 Series

Advanced Layer 3 Switches

Allied Telesis x900 Series Layer 3+ switches have high-speed 60Gbps expansion bays, which provide a high level of port flexibility and application versatility unmatched by any other 1RU Gigabit Ethernet switch on the market. The expansion modules can be used in a variety of configurations to provide tailored solutions that meet wide-ranging physical networking requirements.

About Allied Telesis

For nearly 30 years, Allied Telesis has been delivering reliable, intelligent connectivity for everything from enterprise organizations to complex, critical infrastructure projects around the globe.

In a world moving toward Smart Cities and the Internet of Things, networks must evolve rapidly to meet new challenges. Allied Telesis smart technologies, such as Allied Telesis Management Framework™ (AMF) and Enterprise SDN, ensure that network evolution can keep pace, and deliver efficient and secure solutions for people, organizations, and "things"—both now and into the future.

Allied Telesis is recognized for innovating the way in which services and applications are delivered and managed, resulting in increased value and lower operating costs.

Visit us online at **alliedtelesis**.com

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