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The benefits of an IP-based video surveillance network

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The growing popularity of IP-based (network) video surveillance is driving many experienced installers of analogue CCTV systems towards network-based systems.

So why are these installers moving to network video when CCTV is such a well-established technology?

There are several strong drivers behind the rapid growth in network video:

Image quality: Network cameras have overtaken analogue cameras in image quality and stability. Most network cameras are at least VGA resolution (640x480), equivalent to roughly three quarters of 4CIF, and megapixel and better cameras (at least double the pixels of 4CIF) are readily available. Furthermore, image quality is not a function of cable lengths, which is discussed further on in this article.

Open versus closed: CCTV is by definition a closed system with limited distribution of image data. Network video images can be distributed simultaneously to multiple locations anywhere in the world (even to portable devices like mobile phones) with no loss of quality.

Flexibility: Network video systems can be easily expanded in arbitrary steps. There are no hardware constraints that strongly dictate expansion in groups of four, 16 or any other value.

System cost: Although network video cameras are usually more expensive than analogue cameras, the total installed cost of a system is typically lower, and maintenance and upgrading is usually significantly lower. The main factors reducing system cost are that network video uses commodity, off-the-shelf computer and storage systems, and common network cabling instead of dedicated coax.

Integration: Network video, as the name implies, makes the video surveillance system part of an organisation's IT infrastructure. Integration of video with existing desktop PCs, software applications and network management systems is very easy compared to integration of analogue systems.

Digital Video Transmission

The term digital was introduced in the last sentence and merits some discussion as the term is used so widely but seldom explained.

As can be seen from the above, IP video surveillance benefits are numerous and offer cost effective, cutting edge solutions for the industry. However, with regards to image quality, the benefits extend even further.

Our real world is analogue, meaning that things generally vary in a smooth, continuous way. When an analogue camera forms an image of a scene, it generates signals that represent the brightness of points in the scene in red, green and blue colour bands.

Unfortunately, high accuracy of scene rendition is compromised by transmission over long cables and through repeaters. Every metre the signal travels, and every connection and every electronic device (such as a repeater) that it passes through, adds some noise and hence loss of quality. Splitting the signal to multiple destinations also decreases signal quality.

When an image is digitised, the situation changes completely. A network camera digitises the image at source: it samples the image at a large number of points (each point is a pixel, or picture element) and converts the level of brightness in each of the red, green and blue bands into a number. After this initial digitisation step, the image data is transmitted as a stream of numbers.

Clearly, there is some loss of information in digitisation, but in return for that you get the ability to transmit, share and store the image as pure data, with no loss of quality over distance or time. Modern network cameras can perform digitise images that to the naked eye are as good as or better than their analogue counterparts.

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About Axis Communications

Axis is an IT company offering network video solutions for professional installations. The company is the global market leader in network video, driving the ongoing shift from analog to digital video surveillance. Axis products and solutions focus on security surveillance and remote monitoring, and are based on innovative, open technology platforms. Axis is a Swedish-based company, operating worldwide with offices in more than 20 countries and cooperating with partners in more than 70 countries. Founded in 1984, Axis is listed on the NASDAQ OMX Stockholm, under the ticker AXIS. For more information about Axis, please visit our website at www.axis.com.

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