

# Challenges of a Digital Security System

*There is now no doubt that IP based technology is the way forward for the security and surveillance industry with digitally-networked video products leading the way, closely followed by Access Control and Alarm Systems. With these developments we have also seen a change in attitude towards security systems and it is now commonplace to regard the security system as an integrated component in the corporate infrastructure and can even play a key role in the success of the company.*

To fully harness the added value of this technology we need an understanding of the fundamental challenges facing us when designing a modern security solution. Here we explore some of the issues including interoperability, data storage and advanced analysis.



## ■ Interoperability

Until recently, interoperability has been taken for granted with virtually all CCTV manufacturers producing equipment that implements common open standards such as the composite video standards PAL and NTSC. In the IP video world this has never been the case, however this is changing.

## ■ Compression

Most manufacturers now produce hardware supporting MPEG4 and most are planning support for the newer H.264 (MPEG4 Part 10) compression algorithm. Certain applications, such as high resolution cameras, require frame-based video compression and MJPEG has emerged as the standard here. This is a very encouraging step in the right direction; having standards-based video compression promotes interoperability between systems and allows features such as clip exports which can play in ubiquitous applications like Apple QuickTime.

## ■ Transportation

With compatibility between the video encoder at the camera end and the video decoder at the display end, the next interoperability issue is the method of transmission across the intervening network. Video is either sent in high-speed packets where the Real-time Transport Protocol (RTP) is becoming the adopted standard or as streams where HTTP is becoming commonplace, especially for MJPEG video. There are very few proprietary standards still in existence and these are quickly disappearing as manufacturers are forced down the standards route by commercial pressure.

## ■ Recording

In terms of the basic requirements, video recording hasn't changed much since the VCR was first used in the traditional analogue CCTV system. However digital technology has opened up the possibility of many new features which were previously impossible.

## ■ Control

All this compatibility may be meaningless without compatibility at the device control level; how to tell a camera to send video to a monitor. Although there is still work to be done defining such a standard, over 50% of the manufacturers we work with at Codestuff now support Real-Time Streaming Protocol (RTSP) for video streaming control. Adopted from the multimedia streaming world and now reaching its second revision, RTSP provides generic control of media clients and servers.

The number of manufacturers now supporting true RTSP/RTP control is growing fast, again allowing standard applications such as Real Player to view the video directly from the camera.

## ■ Storage

One of the first things to consider is the storage requirements of the recording system. The cost per unit of data storage is still the biggest limiting factor when it comes to recording video streams. The choice of compression algorithm does influence the storage capacity in both the short term and the long term. MJPEG has a much greater storage requirement per unit time than MPEG4, however it's much easier to degrade an MJPEG stream over time to recover redundant storage than it is with MPEG4 leading to more efficient long term storage solutions.

## ■ Playback

Usability dictates that playback should be available on demand and instantly. This is directly affected by the video indexing method used when recording streams. The best method is to write index information to a file, separate from the video data, this allows fast access in indexing data and hence direct random access to the recorded video. However this leads to a proprietary file format as none of the standard formats supports the unique requirements outlined here.

## ■ Exporting

Exporting also has its technical issues. The stored data needs to be flexible enough to allow data to be extracted from any point and still be playable. The original recording information also needs to be retained. It may also be beneficial to add information during playback to identify the reviewer and keep an audit trail. Also the exported clip may need a digital signature providing a degree of traceability to authenticate its source and integrity.

## ■ Conclusion

Codestuff LTD is a company very much at the centre of this changing industry with many years in-depth knowledge and experience and a passion for providing top quality services and products. Our overall aim is to help everyone benefit from the rolling technological advances by promoting interoperability, standards-based systems and modern development practices.