Improving Homeland Security with Video Monitoring and Surveillance

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About Optibase

Optibase, Ltd. (NASDAQ: OBAS) provides high-quality, cost-effective products that enable the preparation and delivery of MPEG-based digital media over broadband networks. Optibase has created a breadth of product offerings used in applications, such as: video-on-demand; real-time video streaming; digital video archiving; distance learning; and business television. With headquarters in Israel, Optibase operates through its fully-owned subsidiary in Mountain View, California and offices in Austria, France, Japan and China. Optibase products are marketed in over 40 countries through a combination of direct sales, independent distributors, system integrators and OEM partners. For further information, please visit www.optibase.com.

Introduction

Demands for better homeland security have accelerated since the 9/11 attacks in New York and Washington. While there is a need for increased vigilance in crowded places, there is a desire on the part of both proprietors and the public, that these measures be as unobtrusive as possible, so as to maintain the fabric of community, spontaneity and unencumbered movement for all. At the same time, there is also a demand that these systems be more comprehensive and provide high quality video so that monitors are able to see the most minute details.

One way of meeting this need is through the use of video monitoring. Traditional video surveillance and monitoring systems conjure in the mind small black and white images of nearly unrecognizable objects. But unparalleled advances in digital video technology have completely transformed the picture. This white paper explores the available types of video monitoring and the advantages of using already available IP networks to enable high quality video monitoring in widespread areas.

Types of Video Monitoring

Video monitoring systems can differ depending on the available technological infrastructure and the specific requirements of a site. Many video monitoring and surveillance systems rely on remotely controlled analog cameras that transmit an analog video signal over a coax cable to a central control center.

The goal of the video monitoring system also affects the type of system installed. In vulnerable public places such as train stations or bus stops, video cameras are combined with other emergency communications systems like hot phones or duress alarms.

But the sophistication and video quality of analog systems is limited and barely meet the more stringent requirements expected today. Analog video monitoring systems are limited by technology. Video quality is usually bad because video has to be transported over co-axial cables to the command center. The capacity of coax cables is limited and so the signal that is transported is limited. When the analog video signal is received at the control center it was stored on magnetic tape, an unfriendly medium that does not allow for easy retrieval or search.

Thanks to the development of IP networks and digital video, the video monitoring landscape has changed dramatically. Video transmission over IP networks can greatly enhance video monitoring systems, which are fundamentally systems that use video networking infrastructure.

The Basics of Video over IP Monitoring

So how can IP video technology lend itself to better video monitoring solutions?

In all such scenarios, the objective is to have a simultaneous view of different physical locations. A shopping mall might want to monitor activity in the car park, the rest rooms, the food court and so on. A transportation authority might want to monitor traffic and car speeds on a 200-mile stretch of freeway. A university might want to monitor campus buildings, laboratories and cafeterias.

In all of the above cases, video signals from multiple locations need to be transmitted to a central control and monitoring center. Each remote location is equipped with a camera. The camera can be remotely controlled or static, depending on the target area.

Using high quality MPEG Video for Monitoring

There is an increasing demand that video monitoring solutions provide TV quality signals so that control centers can see exactly what is going on at any given location. The only digital video standard that meets these requirements is MPEG. MPEG is an international standard that compresses analog video signals without any perceived loss of quality.

A monitoring system based on MPEG compression would consist of high quality analog cameras that feed signals into an MPEG encoding and streaming platform. The MPEG streaming platform interfaces with the IP network and transmits streams to a central control center. There the digital video is cataloged using archiving and logging software and stored on a video server for easy retrieval at any later date.

The Advantages of MPEG Video and IP Networks for Monitoring

Quality

Today, security and safety requirements demand excellent video quality of video. Monitors want to be able to see the most minute details in all weather conditions, day or night. MPEG, an international video compression standard using in broadcasting and DVD creation, can provide the top quality video required by today's monitoring systems.

Logging and archiving

One of the greatest advantages of digital video is our ability to manipulate it. Digital video can be stored on video servers and indexed with video logging software. Monitors who want to check a video archive can carry out key word searches and get immediate access to footage taken months previously.

Use of existing infrastructure

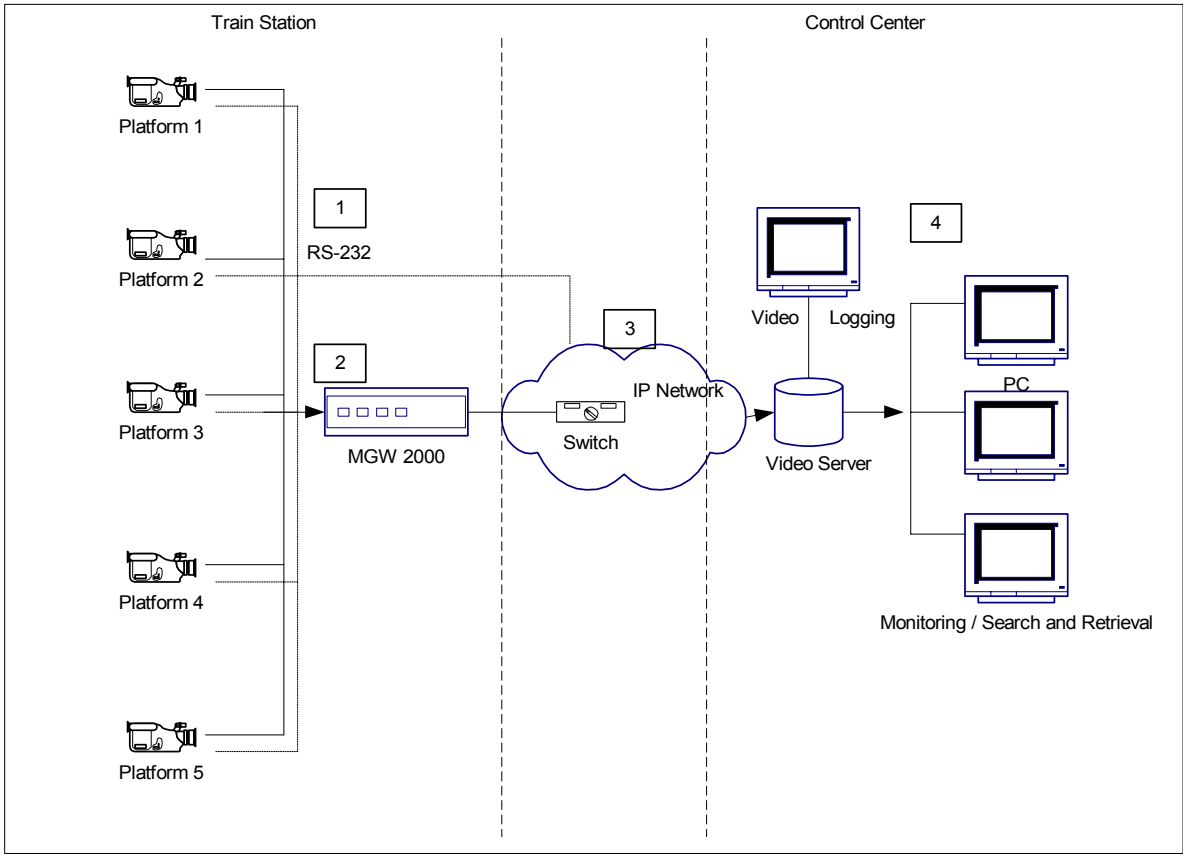
Most organizations already have high-speed networks that can support video transmission and streaming. Most equipment interfaces with the network at the point of transmission and at the control center.

How IP Video Monitoring Works

Once the video signal is captured and ready for transmission, it is fed into a streaming platform which wraps the signal in IP and transmits it over the network to the control center. Options 1 and 2 show how a video monitoring solution can be deployed in a Train Station monitoring solution.

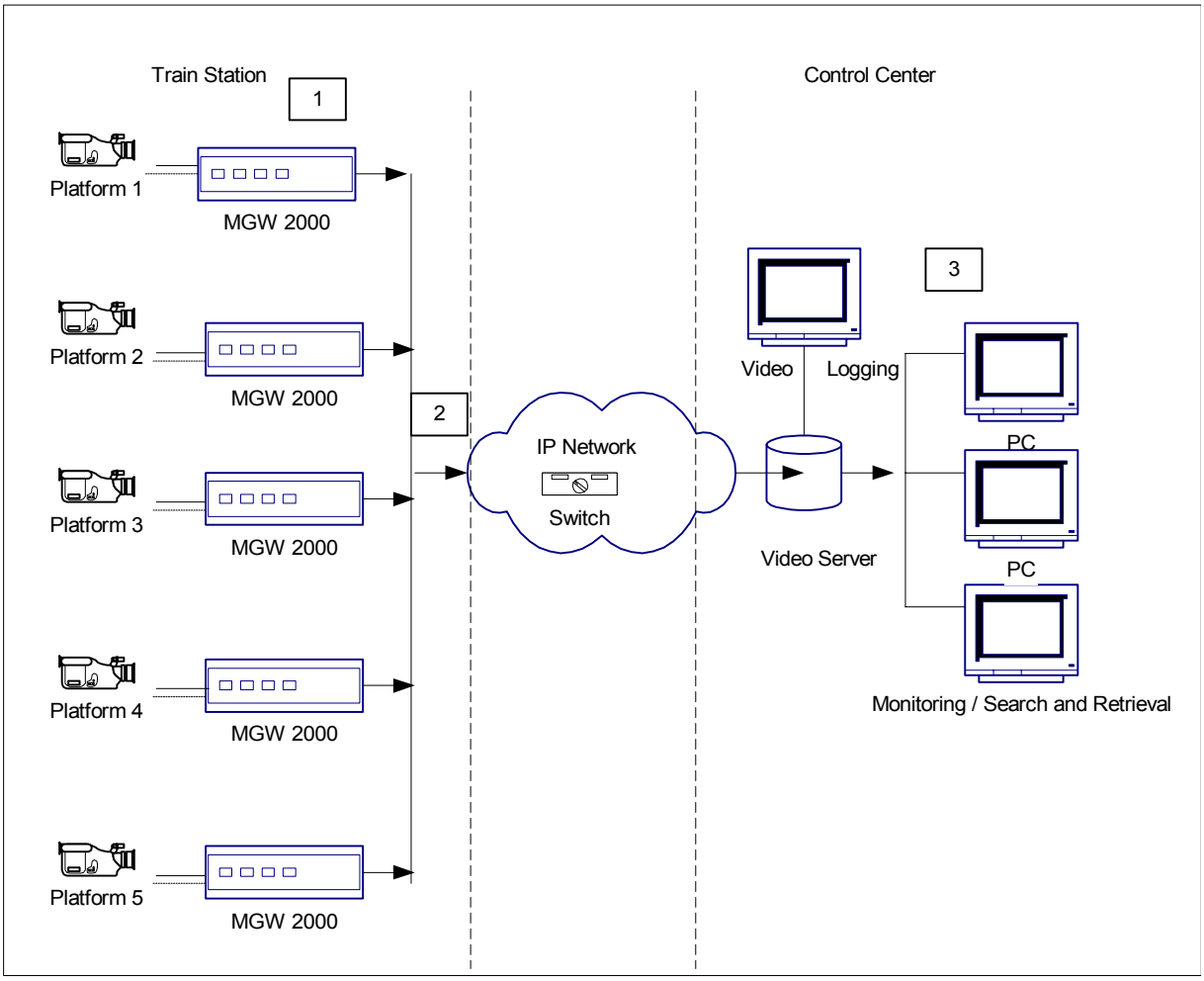
Option 1: Integrating Analog and IP Infrastructure

This solution merges analog and digital technology. Pan -Tilt-Zoom (PTZ) cameras are located at different platforms. The cameras are controlled from the control center by a RS-422 connection. The analog video signal is transported by coax cables equipped with repeaters (1). The video signals are fed into a multi-channel MGW 2000 encoding and streaming platform which encodes the signals into high quality MPEG streams (2). The six MPEG streams are then transmitted live, in real-time, over an IP network to the control center (3), where the video can be monitored in real-time and archived for future analysis (4).



Option 2: Using an All IP Infrastructure

This solution relies solely on digital technology. The cameras are located at different platforms. The analog (or digital) video signal is fed directly into a MGW 2000 encoding and streaming platform which encodes the signal into a high quality MPEG stream (1). Each MGW 2000 interfaces with the IP network, transmitting the streams live, in real-time, to the control center (2) where the video can be monitored in real-time, archived and indexed for future analysis (3).



The Benefits of IP for Video Monitoring

The term IP refers to a transmission protocol – the Internet Protocol. The IP protocol is actually part of TCP/IP, a group of Internet protocols, which enable communication over heterogeneous networks. This means that when using the IP protocol different types of networks can interface and communicate with each other, regardless of the networking infrastructure. This is especially relevant for video monitoring solutions which may be spread over diverse geographic terrain and consist of different types of networking infrastructure.

Conclusions

The need for more relevant and sophisticated homeland security solutions is reflected in increased demand for video monitoring. Two trends underscore this need:

1. The demand for excellent video quality
2. The move to digital video technology and IP transmission

Existing all-analog systems can be upgraded by installing an IP digital video head-end at the monitoring site. The digital head-end integrates multiple analog streams and transports them over an IP network to the control center.

Systems that are still in set-up or that are being installed at sites which already have IP networks in place, can take advantage of all IP infrastructure by feeding the analog signal directly into a video encoding and transmission platform. The MPEG streams are then transmitted over the IP network to the control center.

Both of the above options offer TV quality video and the efficiency of IP video transmission.

More about Optibase's MGW 2000 MPEG streaming platform.