GREEN SURVEILLANCE

STRATEGIES TO IMPROVE EFFICIENCY AND LOWERING COSTS

aimetis | WHITE PAPER

IMPACT OF RISING ENERGY COSTS

Rising energy costs are compelling organizations to optimize their computing environments. In fact, energy costs have quickly become the fastest growing operating cost, propelling many corporations to embark on new conservation and green initiatives. Fortunately, green IT not only helps the planet but reduces operational pressure.

Green IT becomes even more important when video surveillance is taken into consideration. With the recent proliferation of CCTV, energy consumption from video surveillance has increased dramatically, resulting in higher total cost of ownership (TCO). However, as video surveillance transitions from proprietary "black box" DVR deployments towards IP deployments, using commercial-off-the-shelf hardware, video surveillance becomes both greener and leaner.

This white paper will describe how IP-Surveillance can lead to a greener environment and increased efficiency through reduced energy costs, increased server capacity utilization, and higher scalability and availability as compared to analog CCTV.

> *"For every dollar spent on IT equipment, 50 cents goes to powering and cooling them."*
>
> Worldwide Server Power and Cooling 2006-2010 Forecast, IDC

REDUCING HARDWARE FOOTPRINT FOR VIDEO SURVEILLANCE

Video surveillance energy consumption is largely attributed to the electrical power required to operate the servers that are running the cameras and storing vast amounts of recorded video data.

The fact that most CCTV deployments today make inefficient use of the energy they consume is hardly a surprise. Industry research estimates that more than 50 percent of the energy used in the server room goes to power and cooling equipment rather than computations and processing. The true costs of running excess servers and storage are not well understood.

A recent report by the Environmental Protection Agency claims data centers in the US consume 61 billion kWh annually, or approximately 33 billion kg of CO_2 emissions, which is more than the total CO_2 emissions of several countries. In terms of dollars and cents this translates into a total electric bill for data centers in 2005 of about $2.7 billion for the U.S. and about $7.2 billion for the entire world. This breaks down to an average cost of $550 per year, per server.

It goes without saying that when deploying a video surveillance system, best efforts should be taken to reduce the number of servers required. This makes sense not only for the environment, but also for the pocket book.

IP surveillance offers clear advantages over analog CCTV or DVR deployments with significant savings as a result of sharing existing network infrastructure, computation, and storage.

It should be noted that IP surveillance software plays an important role in helping to reduce the hardware footprint. What follows is a description of features to consider when evaluating the environmental and operational impact of IP surveillance software.

✔ CAMERA DENSITY PER SERVER

With CCTV deployments, typical camera density ranges from 4 to 32 channels per DVR, and come in increments of 4 or 8 channels. Consequently, numerous physical servers are necessary since the total number of cameras exceeds one server. With IP video surveillance software, more than 200 cameras can be managed and recorded using a single, energy efficient server.

Take an example of a 70 camera deployment. In this scenario, three 4U DVRs can be replaced by one, industry standard 2U server running Windows and Aimetis Symphony™ video surveillance software. Consequently, energy consumption is reduced by more than $1000 per year when factoring savings from fewer servers and less cooling requirements.

✔ VIRTUALIZATION AND SERVER REDUCTION
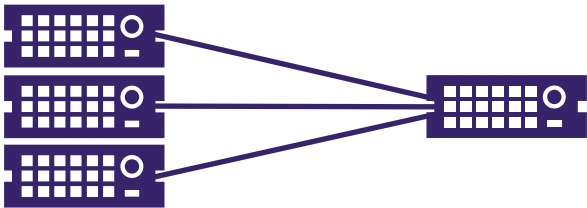
One of the reasons that energy costs spiral out of control is found in the "one-to-one-to-one" hardware approach, where each server hosts only one operating system that, in turn, runs a single application. Not only are these environments expensive, but they also promote IT inefficiency.

This underutilization scenario is typical with deployments using DVRs. For example, supporting nine cameras may require the use of two 8-channel DVRs. However, both DVRs are typically operating with a CPU load of less than 10 percent.

This "one-to-one-to-one" hardware approach unnecessarily increases software maintenance and support due to the sheer number of physical servers requiring software patches or hardware maintenance. Worse still, the risk of data loss is significant since the cost of purchasing and operating numerous back-up servers is prohibitive.

With virtualization technology, organizations can consolidate servers and easily reduce IT power requirements and overall cost. For example, with only one physical server instead of two, server BIOS updates are cut in half, backups and disaster recovery becomes a fraction of the cost with fewer physical servers to protect, and network ports are relinquished with fewer physical servers requiring connectivity to the network.

Typical analog and DVR CCTV deployments cannot leverage the excess computing and storage capacity that virtualization provides due to their proprietary nature. Conversely, a surveillance solution that uses open IP video management software running on commercial off-the-shelf hardware is able to benefit from virtualized computing environments. As a result, IP surveillance is not only better for the environment but offers a substantially lower cost.

Virtualization also improves resiliency of the IP surveillance deployment because existing IT staff are already maintaining the server and network infrastructure. Since this hardware is used by other mission critical applications which are core to the business, IP surveillance freely benefits from this enhanced availability without adding additional support costs.
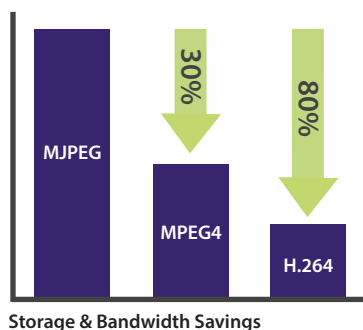
✅ VIDEO ANALYTICS
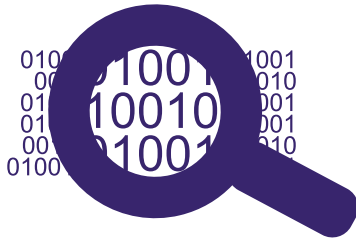
Video analytics can play a sizeable role in reducing video storage requirements by only recording when relevant activity occurs. This, in turn, reduces space and energy requirements. It should also be noted that video analytics are significantly more accurate at detecting relevant activity than video motion detection (VMD) which means less storage is wasted for false events.

In a typical surveillance environment not using video analytics for event based recording, the amount of storage required for 16 cameras, storing 24 fps at 640x480 resolution for 7 days using MPEG-4 is about 20GB per camera. Aimetis studies have shown in a difficult outdoor environment that using Aimetis Symphony (with video analytics enabled) results in storage savings of more than 50%.

With video analytics, video recordings caused by irrelevant background noise is significantly reduced, resulting in less disk space required for the same 7 day period. Better still, video analytics also reduces rack space and electricity dedicated for storage.

Unfortunately, in many cases video analytics is supplied by a different vendor than what was used for video recording. Aimetis Symphony eliminates this problem by providing a single software product for both video management and video analytics. As a result, users are able to take full advantage of the cost-saving benefits without the corresponding server increase for running analytics.

EMBEDDED ANALYTICS

Embedding analytics on network devices allows the processing of video to occur directly on the device itself. This dramatically increases the scalability of the solution since PC based processing is no longer a bottleneck. As a result, embedded analytics and virtual PC environments go hand in hand. Aimetis offers a suite of analytic packs that can be embedded on network cameras.

Despite the challenges that analytics pose due to the increased CPU requirements, the storage savings are real, and embedded cameras make analytics even more compelling. In many cases, servers have underutilized processing power which can be leveraged for PC based analytics, so even in cases where PC based analytics are needed, it is no guarantee that additional servers are required.

✅ VIDEO COMPRESSION

H.264 is the preferred video encoding compression standard capable of providing good video quality at substantially lower bit rates than previous standards. H.264 represents a 50% reduction in bandwidth and storage over MPEG-4 and an 80% reduction over MJPEG, which reduce hardware, space, and power requirements.

Storage & Bandwidth Savings

✅ POWER OVER ETHERNET

Power over Ethernet (PoE) is a technology for wired Ethernet LANs (local area networks) that allows the electrical current, necessary for the operation of each device, to be carried by the data cables rather than by power cords. This minimizes the number of wires that must be strung in order to install the network. The result is lower cost, less downtime, easier maintenance, and greater installation flexibility than with traditional wiring. Additionally, using PoE, it is possible to provide the data required for network software to reduce enterprise energy consumption with better power allocation and management.

EFFICIENCY OF REMOTE MONITORING

Remote surveillance is an effective tool for eliminating unnecessary driving or flying to verify alarms and track job-site progress.

Consider a construction site which will often deploy cameras to protect against raw material theft.

With video analytics, remote monitoring personnel can be notified of suspicious activity (e.g. perimeter breach) and verify the alarm before sending a guard, or police to drive to the site. The same argument applies for corporate facility security as well.

Additionally, remote surveillance can be used in place of management driving or flying to job sites to track job-site progress. To put the benefit of remote surveillance into perspective, eliminating just one 50 mile drive, or one three hour flight saves 88.2 and 1543 lbs of carbon dioxide emissions respectively.

GOING GREEN WITH AIMETIS

Aimetis is committed to helping build a clean energy future. As Aimetis grows, we want to make sure we minimize our impact on the Earth's climate. This means taking every step we can to implement innovative and responsible environmental practices across our company to reduce our carbon footprint, ensure efficient computing. and help our employees be green. To this end, Aimetis has implemented a green distribution and marketing strategy.

ONLINE DISTRIBUTION MODEL

A study commissioned by Microsoft and conducted by WSP Environment and Energy found that digital delivery reduced total tonnes of carbon emissions by 88%. The elimination of transportation and packaging provides the greatest opportunity for carbon emissions reduction.

By making products available online via digital download, Aimetis is able to eliminate nearly 100% of the carbon emissions associated with transportation as shipping is not required. Additionally, without the need for packaging, online software distribution eliminates carbon emissions associated with creating and disposing of plastic packaging.

DIGITAL COMMUNICATIONS

Traditional print communications for newsletters, advertising, brochures, and other marketing documents requires a huge amount of paper and requires shipping, storage, and waste; contributing to a negative environmental impact. Aimetis strives to reduce this environmental impact by executing a largely digital marketing communication strategy.

By providing a consistently updated online document library, Aimetis is able to provide up-to-date information while significantly reducing printing and waste incurred by disposing of out-of-date material. Additionally, Aimetis chooses to conduct most of its advertising via online industry websites and Google ADwords in place of traditional print publications in an effort to support green initiatives.

SUMMARY

Aimetis Symphony provides users with many green technology features and a licensing model that helps to reduce server usage and waste. This has a significant effect in reducing datacenter energy consumption and environmental impact.

Additionally, as an open integration platform with video analytics built in, Aimetis Symphony provides the necessary intelligence to help reduce energy outside the server room, presenting an opportunity to further reduce carbon emissions, and cost. Finally, by employing green business practices, Aimetis allows customers to reduce their carbon footprint and contribute to the global environmental initiative in a positive way.

QUESTIONS

For any questions regarding green surveillance or any content in this whitepaper please contact us at Aimetis anytime.

aimetis.com
info@aimetis.com

ABOUT AIMETIS

Aimetis Corp. simplifies the management of network video for security surveillance by offering smart solutions with the lowest total cost of ownership for our connected world. Combining an industry leading video management system with integrated analytics and centralized management in the cloud, Aimetis delivers the most scalable and easiest to use video management platform on the market. Founded in 2003, Aimetis has established itself as a global leader in intelligent video management from its headquarters in Waterloo, Canada. Aimetis has distributors and certified partners in over 100 countries and serves a variety of industries, including retail, transportation, and others.