

White Paper

Turn Surveillance Video into Actionable Intelligence

NVR Employs H.265 to Maximize Bandwidth and Storage Usage



Intelligent digital security and surveillance (DSS) solutions allow businesses and other entities to view and record incidents at higher resolutions than ever before. Equally important, these solutions enable video analytics that can provide real-time actionable intelligence to improve security and business processes. However, the growing use of high-definition (HD) video and interest in ultra-high-definition (UHD) 4K resolution threatens to put a strain on network bandwidth, video decoding, and storage.

This article considers how video surveillance operations can use the latest network video recorders (NVRs) to implement the high-efficiency video coding (HEVC) known as H.265 to improve compression. Specifically, we explore how NEXCOM's new NVIS 1410 employs the latest Intel® Pentium® and Intel® Celeron® processors (codenamed Braswell) and H.265 to reduce pressure on bandwidth and storage. We also look at how these processors deliver hardware-accelerated video decode, up to 4K resolution, and smooth playback.

Doing More with Less

Few businesses can afford to have security personnel continuously watching live feeds. The need to do more with less is compelling these businesses to consider intelligent, proactive DSS solutions with analytics capabilities that can do the watching and alert security staff when a potential incident is in

progress. These solutions can play effective roles in security, loss prevention, and safety. Intelligent DSS solutions can also make contributions in other business areas. Once valued solely for forensic applications, surveillance video is now a rich source of information that can be analyzed in real time and then acted on immediately or collected for later use in improving training, marketing effectiveness, and operations. For example, stores gain valuable insight by monitoring how many people visit a display and how long they spend there. Stores can also save money by using actual customer counts and length of checkout lines to perfect staffing levels.

A Revolution in Resolution

High resolution like 4K display enables sophisticated solutions for tracking people, capturing facial characteristics, reading license plate numbers, and monitoring large areas such as parking lots with fewer cameras. Although high resolution can deliver a clearer picture and better viewing experience to security, high resolution demands faster transcoding to maintain smooth playback over wired and wireless connections. In particular, video delivery must be tailored to a wide range of devices – from high-powered client workstations to tablet computers and smartphones. In addition, the larger files sizes of 4K



Figure 1. Clear, sharp video helps retailers effectively resolve transaction disputes and better analyze customer behavior.

DSS systems require greater storage capacity. These factors make performance and bandwidth-saving technologies important consideration in selecting an NVR.

Compression Is Essential

Performance-optimized, PC-based intelligent NVRs that capitalize on processor and video-surveillance innovations are rapidly altering the surveillance landscape. Fully integrated with video management software (VMS), these NVRs deliver up to 4K resolution video, real-time audio/video transmission, software intelligence, and network-centric operations. What's more, they do all this while making the most of storage space and bandwidth.

With open architecture and 4K camera compliance, intelligent NVRs enable crystal-clear display while allowing users to zoom in on images without sacrificing pixels (Figure 1). By linking high-quality video to individual transactions, store managers and security personnel can easily verify transactions and trace the source of inventory shrinkage, cash register skimming, or transaction disputes.

To optimize bandwidth and storage, businesses must be sure to select intelligent NVRs that can handle high-resolution video feeds from multiple cameras and convert them to H.265 format. H.265 doubles the data compression ratio compared to H.264 (Advanced Video Coding or AVC), while delivering the same level of video quality. By reducing bitrate usage by up to 50 percent, H.265 greatly improves the usability of 4K in networked security applications.

Powerful and Versatile Intelligent NVRs

To help businesses meet their NVR needs, NEXCOM developed its NViS 1410. Based on the latest Intel® Pentium® and Intel® Celeron® processor N3000 product family, this NVR accelerates 4K decoding and enables live 4K views, instant full-HD images, and smooth playback. With appropriate third-party VMS integration,

the NViS 1410 supports video analytics such as intrusion detection, customer traffic patterns, people counting, license plate reading, abandoned-object discovery, scanner-bypassed items at POS and self-checkout stations, and facial recognition. These capabilities enable alerts and searches based on specific events (Figure 2).



Figure 2. Equipped with the latest Intel® Pentium® and Intel® Celeron® processor N3000 product family, the NViS 1410 can run video analytics software to detect events and send alerts to security staff or activate alarms.

The NViS 1410 also facilitates forensic investigations by supporting dual displays (HDMI and DVI-I). Operators can monitor live video, watching as the latest action unfolds, while also reviewing video showing what led up to the current incident.

Fast, Reliable Storage

NEXCOM designed the NViS 1410 to prolong drive life and system reliability – key concerns for DSS systems recording critical information. The NViS 1410 features a mini-SATA

SSD as a boot drive for the operating system and VMS. This provides greater system reliability and faster application response while keeping storage hard drives devoted exclusively to video.

To provide non-stop recording services, the NVIS 1410 supports an internal surveillance-grade 3.5-inch HDD with up to 6 terabytes of capacity. Unlike desktop PC drives built to run for only short intervals, surveillance-grade disks are built for 24/7, always-on DSS systems.

The surveillance-grade hard drive includes improved ATA streaming and caching algorithms tuned for the write-intensive, low-bit-rate, high-stream-count applications common in DSS systems. Using such drives enables small-to-medium-sized business (SMB) owners and retailers to avoid the costly consequences of missed frames or lost footage during the retrieval of surveillance recordings.

Adding to its scalability and flexibility, the NVIS 1410 features fast I/O interfaces such as eSATA 3.0 and USB 3.0. Users can choose either interface to get the maximum speed out of external storage devices for backup or expansion.

Powering the Next Generation of DSS

Based on Intel's 14 nm manufacturing technology, the latest system on-chip (SoC) Intel Pentium and Intel Celeron processors deliver all the necessary muscle to power

the video and graphics performance and video analytics essential to DSS systems for SMBs. Designed to accelerate video decode operations, their low-power Gen8 graphics architecture enables faster video processing with less CPU loading.

There is no need for a discrete graphics card. Improvements such as additional execution units, graphics architecture enhancements, enhanced codec decode support, and support for the latest graphics APIs deliver up to two times better graphics performance compared to the previous generation. The SoCs' 16 graphics execution units enable the fast transcoding performance necessary to efficiently handle DSS workloads. Another feature, Intel® Quick Sync Video, provides hardware-accelerated video decode.

With support for the latest video formats including H.265, the new SoCs enable the NVIS 1410 to decode video at the rate of 32 channels of 1080p at 30 fps or 8 channels of 4K at 30 fps. Support for H.265 allows the NVIS 1410 to store high-quality videos at relatively low bitrates and reduces file sizes up to 50 percent (Figure 3). The result is more recording time on the same amount of disk space for a lower total cost of ownership.

Graphics optimizations from Intel® HD Graphics technology enable these processors to also deliver higher performance image enhancement. A suite of image-decode and

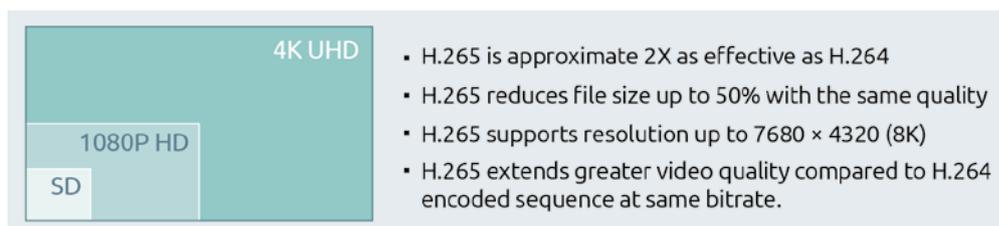


Figure 3. The latest generation Intel® Celeron® and Intel® Pentium® processors support H.265, which enables 4K resolution while reducing pressure on bandwidth and storage.

processing technologies built into the processor graphics improves video playback to deliver cleaner, sharper images with more natural, vivid colors and skin tones. These enhancements aid video analytics in everything from license-plate recognition to distinguishing faces.

As for overall performance, these Intel Celeron and Intel Pentium processors offer up to four cores and include Intel® Burst Technology. This feature dynamically controls the performance and power of both cores and graphics, boosting performance exactly where and when it is needed. One moment it could be for video transcoding, the next moment it could be for video analytics.

Make DSS Solutions See More, Show More, Do More

The latest Intel Pentium and Intel Celeron processors make the NEXCOM NViS 1410 a strong DSS solution for retail and SMB surveillance. They enable the NViS 1410 to deliver 4K graphics, hardware-accelerated H.265 transcode performance, and the processor power for advanced analytics. With its surveillance-grade drives tuned for DSS operations and its design for storage reliability, the NViS 1410 offers solid 24/7 performance. It then goes a step further by providing the capacity for improving security and business operations with actionable video intelligence.



The Intelligent Systems

Founded in 1992, NEXCOM integrates its capabilities and operates six global businesses, which are Multi-Media Solutions, Mobile Computing Solutions, IoT Automation Solutions, Network and Communication Solutions, Intelligent Digital Security, and Medical and Healthcare Informatics. NEXCOM serves its customers worldwide through its subsidiaries in five major industrial countries. Under the IoT megatrend, NEXCOM expands its offerings with solutions in emerging applications including IoT, robot, connected cars, Industry 4.0, and industrial security.

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