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Single Board Design Scales into Many Intel® Digital Security Surveillance (Intel® DSS) Solutions

EVOC relies on embedded Intel® Architecture (IA) to adjust performance with minimal development

Intel in Communications

Summary

When an industry demands an ever-increasing variety of features and performance attributes from its technology solutions, how can developers maximize traditional economies of scale? It's a perplexing problem facing more solution providers as technical applications become more ubiquitous.

Studying the rapid expansion of the digital security surveillance (DSS) industry can offer a glimpse of the dilemma posed by increasing the variety of technology applications in a given market segment. DSS does not simply scale in performance when applied to different settings; instead, it must change in both performance and scope on a number of variables.

China-based Shenzhen EVOC* Intelligent Technology Co., Ltd., was determined to achieve economies of scale in its many digital security surveillance solutions. Using embedded IA to facilitate a common, single-board platform that could be used in multiple systems, EVOC accomplished their mission.

This case study explains why EVOC succeeded, offering an example for others facing similar development challenges.

Background: Security Goes Digital

The notion of "security" has taken on new dimensions in the past few years. Everyone must be "on guard" and nearly everything must be guarded—from cyberspace to outer space, from stand-alone computers to networking and telecommunications infrastructure, from transportation vehicles to systems and routes, from small businesses to shopping malls, factories, and so forth.

Since it's not feasible to station a human guard at all potential attack points, security agents are looking for ways to keep their eyes on multiple targets from a single location. DSS allows significantly broader security coverage with fewer human resources. It is now widely used in a variety of indoor and outdoor settings such as banks, prisons, public and private enterprises, financial centers, storage and warehouse compounds, shopping centers, and even small retailers.
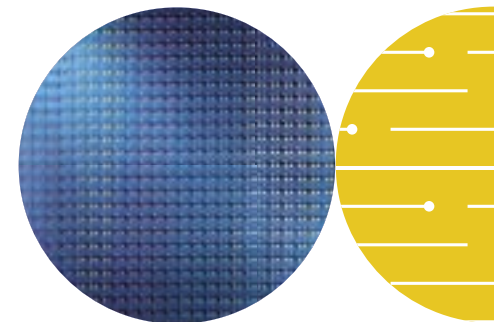
The DSS industry relies heavily on Digital Video Recorders (DVRs) to capture and store video images. A complete DVR system requires both local and networked storage, large volume cache memory for capturing video and/or audio images, compression, and enough processing headroom for both real-time and playback video monitoring as needed.

However, these performance characteristics vary greatly by security setting and require different DVR solutions to meet these needs. Common variables include:

- The number of video capturing channels available on a DVR system usually ranges from 8-32 channels.

- Video quality can vary significantly, reaching up to high-definition audio and video.

- Video monitoring can occur in real-time, or simply be stored for later playback, or some combination of both. These variables affect the DVR system on a wide scale.

- Storage capacity, memory and other processor-based features can also vary depending on the uses assigned to the DVR system.

As a result, DVR systems are typically custom-built for each application setting.

The Challenge

As DSS has expanded into new settings, more DVR solutions are needed to meet the widely varying requirements of those venues. What's more, rapidly changing security situations necessitate speedy delivery of new systems that can be quickly and easily adapted to this ever-changing security landscape.

Customized development—the traditional method for building DVR systems—is no longer a viable option for many DVR OEMs or their customers. Such original design work is time-consuming, which prevents rapid response to changing threat conditions.

For EVOC and other DVR industry developers, the challenge lies in minimizing the amount of customized design work while maintaining the application versatility required in different digital surveillance settings. With solution variables that affect both hardware and software, this is no easy task.

The Solution: Scalable Performance with a Single Board

With much of its business in the DSS industry, EVOC recognized the problem early. Company engineers determined that a common DVR platform design was needed to minimize the amount of custom development work that would be required. Yet that common design must also be versatile enough in both hardware and software so that it can be applied to multiple DVR solutions.

EVOC's solution called for two standardized elements: an industrial-grade full-size CPU computation card and a standardized chassis with backplane. Both elements of the EVOC design are flexible, offering scalability for a variety of DVR systems. Yet both elements share common platform architecture to minimize the amount of custom development work required.

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David Yuan Qin Wei
Vice General Manager, EVOC

EVOC can simply change the performance features on the full-size CPU card by swapping out the on-board processor. "Intel keeps the same architecture across their embedded product line, which makes it easier for EVOC to develop multiple solutions with a single design," says David Yuan Qin Wei, Vice General Manager, EVOC.

By example, Qin Wei explains: "As the number of video capturing channels increases, the DVR system needs more computation power. We can easily adjust the performance level of the full-size card by changing the IA-based processor and/or chipset. But we don't need to change anything else; the entire board design can remain intact. In our single-board DVR design, we use either the Intel® Pentium® III or Intel® Pentium® 4 processor, as well as the appropriate chipset. With embedded IA, we get maximum performance versatility from a single development effort. All of which ultimately helps EVOC meet aggressive time-to-market requirements and stay competitive in this industry."

Meanwhile, the chassis can be scaled by the addition of CPU cards to add video capturing channels and other high-performance digital surveillance features. The combined versatility of the scalable chassis with backplane and the full-size CPU card offer EVOC's customers a single platform from which to build any number and variety of DVR solutions.

Why Intel?

EVOC chose embedded IA for its single-board solution because its common architecture delivers several time and cost-saving benefits to both designer and customer alike.

Faster Time-to-Market

As discussed earlier, Intel uses a common architecture for its embedded product line, enabling developers to deliver multiple solutions via a single board design. The time and money saved by using a single development effort for different products can be multiplied by the number of end solutions eventually produced via that one design. What's more, by solving the hardware design up front, DVR OEMs can focus resources on the development of complex application software. This allows OEMs to deliver more advanced features and greater overall system performance in less time.

Software Compatibility

Of course, the essential differentiating feature of any DVR system is the application software. Such software is complex and requires significant up-front customer investment. New DVR hardware solutions must be compatible with existing software, and upgradeable both in software and hardware with minimal effort. EVOC says that IA is more likely to offer compatibility with legacy software than other processing architectures. "We found that most DVR application software already deployed—especially for the software image compression function —provides the greatest compatibility and stability when developed on IA," explains Qin Wei.

"We selected IA-based components for many reasons, including performance, compatibility, stability, scalability and flexibility," states Qin Wei. "Along with the strong customer preference for the Intel brand, EVOC can enter the DVR market segment with confidence, knowing our customers trust Intel."

Conclusion

EVOC's successful development strategy is a model for others to follow. Through a common board design based on IA, EVOC can readily deliver multiple solutions, saving customers both time and money in the process. Good deal.

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