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Envivio* Live Broadcaster and Intel® Architecture: Delivering DVD-Quality Streaming Media

WHO Envivio*, a leading provider of MPEG-4 solutions for broadcasters, cable network operators and content developers, Envivio is driving down the cost and raising the profit potential for broadband digital media. No other company offers end-to-end MPEG-4 solutions, from authoring, through broadcasting, to advanced decoding on the client end.	**WHAT** The world's first MPEG-4 encoder with DVD-quality resolution, Envivio Live Broadcaster enables corporations and service providers to stream higher-quality content at a lower bit rate over digital TV and/or IP networks.
WHY Envivio Live Broadcaster delivers a thoroughly compelling viewer experience while making the most of available bandwidth. So broadcasters can dramatically cut the costs of providing the high-quality content that builds viewer share and increases revenue.	**WHY INTEL** As a platform for Envivio Live Broadcaster, high-performance Intel® Xeon™ processor-based servers and Intel® Pentium® 4 processor-based PC clients provide affordable power to compress, distribute and view high-quality content on multiple devices.

Value Proposition

LOWERING PRODUCTION AND DISTRIBUTION COSTS

Before Envivio*, production costs remained high because there was no one standard capable of doing it all—high-quality sound, 2D and 3D images, live motion, animation and interactivity. Authoring for all these media types required mastery of a bewildering variety of tools and formats. Combining multiple media types into a single stream required compromises in quality and functionality. Distribution was limited due to bandwidth costs. And the audience was limited due to the differing standards and capabilities of between various viewing devices.

All these problems are history, thanks to the MPEG-4 standard and Envivio's software technologies that take advantage of it. Envivio's MPEG-4 implementations allow you to combine and manage all media inputs together, and to output and serve a single, high-quality stream—one that makes the most efficient use of bandwidth and works with the widest variety of bandwidths and viewers. The result: lower costs from production through distribution, end-to-end.

INCREASING THE PAYOFF OF STREAMING MEDIA

Envivio's Live Broadcaster delivers all types of content in a standardized format to all types of devices. A single standard makes it easy to create content for a variety of devices, optimizing the viewer experience on each device. It's also easy to digitize analog content, or to repurpose existing content for new target devices without translating to different file formats.

> "Envivio's Live Broadcaster encoding software along with high-performance Intel®-based servers using the Intel® Xeon™ processor and PC clients with the Intel® Pentium® 4 processor provide a complete solution to compress, distribute, and view high-quality content on multiple devices."
>
> **Tom Gibbs**
> Director of Solutions Development
> Intel

With one-time creation and easy repurposing of content, producers and broadcasters can leverage maximum value from each digital production. Instead of combining multiple development efforts to reach a single audience, they can unify development to create a single output stream that reaches all potential audiences—broadband, mobile, satellite, DVD, interactive TV and so on. More eyeballs equals more revenues. Combined with lower production costs, that means digital media pays off like never before.

GIVING CONSUMERS MORE CHOICE

The MPEG-4 standard is coming into widespread adoption, providing end users with a wide range of viewing choices—DVD, DVB, Real*, mobile, handheld platforms and more. With the highest quality experience on their choice of devices, consumers are more satisfied, and more likely to purchase new devices and new content for those devices. Which, of course, further increases profitability for everyone involved in the digital media business.

WHY MPEG-4?

- MPEG-4 is the only standard that addresses all audio/video-enabled platforms on any operating system, cutting up to 70 percent of the labor costs needed to prepare media for streaming to the largest possible audience.
- MPEG-4 has a better feature set and underlying design than any other streaming standard, providing optimal compression, security, protection of intellectual property rights, and an immersive, interactive viewer experience.
- MPEG-4 provides a natural upgrade path for MPEG-2 developers, ensuring that the best products and vendors can compete at higher levels using a non-proprietary standard.

Solution Overview: Envivio Live Broadcaster

"The broadcast and streaming community has been asking for DVD quality, full screen resolution at a lower bit rate, and today they have it," says Envivio CTO Julien Signes.

Envivio Live Broadcaster is the world's first real-time encoder that provides full D1 (DVD) resolution. It saves bandwidth through improved compression algorithms and advanced options for streaming content at a lower bit rate, so broadcasters can use digital TV and IP networks more cost-effectively to reach a wider audience. And it runs on cost-effective, Intel® Xeon™ processor-based servers, so they can count on reliable performance that scales at commodity prices to meet their growing needs.

Broadcasters can now offer the high quality their viewers expect, while saving money and reaching more viewers by using less bandwidth. Envivio Live Broadcaster represents a breakthrough in software MPEG-4 encoders. For the first time, corporations and broadcasters have a solution for streaming real-time, high-quality content that actually makes good fiscal sense—minimizing costs while maximizing potential revenues.

A Closer Look

Envivio Live Broadcaster performs ISMA 1.0-compatible MPEG-4 encoding from a live or prerecorded source. The real-time output consists of a live broadcast session and/or an MPEG-4 file for later streaming or local playback. Broadcast sessions and MPEG-4 files each include one encoded video stream, one encoded audio stream and an m4e announce file.

The software supports a single interface for a wide variety of analog and digital inputs, in a wide variety of video and audio formats. The output can be broadcast through a digital TV network (MPEG-2 Transport Stream) and/or over an IP network. Supported streaming standards include RTP and RTCP over UTP with streaming performed in unicast and multicast modes. Depending on input and output options, Envivio Live Broadcaster produces video and audio streams of up to DVD- and CD-like quality.

The stream can be played by any device compatible with the MPEG-4 ISMA 1.0 specification level 1. For example, Envivio's own software-based player, EnvivioTV*, can be used in PC clients, set-top boxes and other devices to decode and play programming from Envivio Live Broadcaster. The MPEG-4 standard opens the industry to the widest potential audience, using the greatest variety of viewing devices.

Two versions of Envivio Live Broadcaster are available: an Enterprise Edition that addresses the needs of corporate users, and a Broadcast Edition that provides the highest performance for professional broadcasters. In the Broadcast Edition, video bit rates typically range from 500 Kbps to 2 Mbps at 25/30 frames per second in the CCIR601 format 720x576. The audio bit rate is typically 96 Kbps, providing 44KHz stereo.

Envivio Live Broadcaster also includes an API for application development, as well as features for project management, monitoring, previews, jobs programming, VTR and more—providing professional control over virtually every aspect of the broadcast. And it all runs on Intel® architecture, so broadcasters can count on reliability and great performance while making the most of their technology budgets.

The Intel Advantage

"Intel architecture is at the core of Envivio's MPEG-4 solution set," says Eric Deniau, Envivio's vice president of engineering. "Intel®-based platforms are available for every part of the solution, from post-production design and encoding, to live streaming over IP networks, to decoding on set-top boxes, PCs and personal viewing devices." Intel architecture's consistent instruction set and powerful tools enable Envivio's engineering team to quickly develop, verify and deploy interoperable, end-to-end solutions.

Envivio's customers also benefit from the choice of Intel architecture. Intel-based platforms are the worldwide standard. On the business side, that means broadcasters can choose from a wide variety of competitive vendors and configurations to suit their needs. And on the audience side, it means millions of viewers are already equipped to receive MPEG-4 broadcasts, while vendors are creating the software viewers, set-top boxes and other devices that will reach millions more.

Intel's considerable price/performance advantage over monolithic, proprietary architectures is creating affordable new capabilities in every high-tech industry. Envivio Live Broadcaster is a classic example. Running under Microsoft* Windows* 2000 Professional on Intel Xeon processor-based servers, Envivio Live Broadcaster has all the platform power and reliability needed to provide optimized encoding and the highest levels of quality. So broadcasters save on both technology and bandwidth costs, while delivering the content that keeps audiences coming back for more.

And speaking of the audience, Intel® Pentium® 4 processor-based PCs are quickly becoming a standard feature in homes and offices everywhere—providing a perfect platform for high-performance, high-resolution, interactive viewing of digital streams. Intel® processors also provide the brains in an ever-growing selection of decoders, from set-top boxes and entertainment centers to laptops and personal viewing devices.

Intel and Envivio are revolutionizing the digital media industry. "Envivio's Live Broadcaster encoding software along with high-performance Intel-based servers using the Xeon processor and PC clients with the Pentium 4 processor provide a complete solution to compress, distribute, and view high-quality content on multiple devices," says Tom Gibbs, director of solutions development at Intel. "Intel is happy to be working closely with Envivio to optimize both the server and client software and assist them with co-marketing activities to accelerate the market adoption of MPEG-4 as the ISO/IEC multimedia standard."

Whether creating, broadcasting or viewing content, the streaming media experience is best when processing power is highest. Intel provides that kind of processing power at prices the entire industry—and the consumer—can afford.

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