Electra™ XVM

Virtualized Media Processor

HIGHLIGHTS

- Fully virtualized SD/HD MPEG-2, MPEG-4 AVC and HEVC encoding for broadcast and multiscreen services
- Harmonic PURE Compression Engine for market-leading video quality at the lowest bitrates
- Easy-to-deploy video graphics and branding, without custom authoring tools or training
- Transport stream playout, enabling channel origination and linear ad insertion
- Optimization of statistical multiplexing over IP
- Broadcast-grade up-conversion
- Rich audio functionality, including Dolby Digital Plus encoding and Jünger Level Magic audio level adjustment

The Harmonic Electra™ XVM virtualized media processor leverages advances in IT infrastructure to provide the industry's first software-based, fully converged, broadcast-ready media processing platform. Integrating real-time encoding, high-quality branding and graphics, and transport stream playout for broadcast and multiscreen services, Electra XVM offers video content providers and video service providers unparalleled function integration, increased operational flexibility and unlimited scalability.

Electra XVM is the first product to leverage the broad capabilities of the Harmonic VOS™ platform and architecture. Designed to operate on common hardware platforms in IT data center environments, VOS optimizes the computing power of contemporary Intel-based servers to host a robust set of dynamically deployable application modules. At the heart of Electra XVM is the VOS encoding module, the Harmonic PURE Compression Engine™. An advanced encoding technology that supports SD and HD MPEG-2, MPEG-4 AVC and HEVC codecs over CBR, VBR and ABR encoding schemes, the Harmonic PURE Compression Engine powers Electra XVM with superior video quality at minimum bandwidth. Electra XVM can scale up or down based on required functions, formats, codecs and encoding schemes to accommodate peaks in demand across both broadcast and multiscreen services.

Electra XVM includes integrated video graphics and branding to bring new levels of workflow efficiency to the video transmission chain. Drawing upon the advanced functionality of our Spectrum™ ChannelPort™ integrated channel playout system, this capability also preserves video quality by removing the need to inject baseband components into the IP workflow. Transport stream playout capabilities include channel origination, linear ad insertion and SCTE automation control.

As a completely virtual media processing system, Electra XVM offers a new approach to encoding and channel playout. With its superior video quality, intelligent function integration, bandwidth efficiency and workflow flexibility, Electra XVM is sure to simplify your infrastructure, reduce costs and drive new revenue-generating services.

harmonic VOS®

TECHNICAL BENEFITS

Compression Performance
The Harmonic PURE Compression Engine utilizes Harmonic's market-leading experience in video compression algorithms and multi-pass encoding technologies to provide superior video quality at the lowest possible bitrates. Delivering significantly improved efficiency and simplified upgradeability over hardware-based encoders, the Harmonic PURE Compression Engine also enables true codec independence for maximum flexibility. MPEG-2, MPEG-4 AVC and HEVC codecs are supported, as are SD, HD and Ultra HD content formats for broadcast, cable, satellite and IPTV delivery — including constant, variable and adaptive bitrate streaming.

Preprocessing
Advanced noise-reduction capabilities include Harmonic's signature motion-compensated temporal filtering (MCTF) to enhance the appearance of incoming material. Electra XVM also supports powerful deinterlacing to cleanly deliver progressive formats.

High-Quality Graphics and Branding
Electra XVM possesses a unique set of capabilities to bring graphics and branding into content distribution and service delivery. Rich branding elements are easily added to video channels using Adobe® Creative Suite®. Advanced capabilities, including up to eight layers of graphics, DVE squeezeback with dynamic text insertion, full slate insertion, and independent branding on each channel, enable the creation of sophisticated on-air looks — and add ability to separately monetize second screens.

Statmux Over IP
Electra XVM maximizes the efficiency and flexibility of statistical multiplexing through tight integration with the Harmonic DiviTrackIP™ technology. Applicable for either LAN or distributed WAN environments, DiviTrackIP can support up to 300 ms of WAN round-trip delay, auto-adjust to IP network variations, and form MPEG transport streams with up to 64 channels per pool.

Fully Virtualized
As software, Electra XVM leverages the Moore's Law economics of IT infrastructures. Based on the Harmonic VOS platform and architecture, which runs in OpenStack™ or VMware® vSphere virtual machine environments on approved blade servers, Electra XVM provides hardware transparency and maximum operational flexibility. Virtual machine instances of Electra XVM can be turned up or down dynamically according to demand, and leverage data center MIPS capacity according to the mix of tasks performed. This flexibility is delivered with absolutely no compromise on video quality or functionality.

INPUT/OUTPUT

Ingest & Playout Format	MPEG-TS via IP

DECODING

Video (4:2:0/4:2:2)	MPEG-2, MPEG-4 AVC Up to 1080p @ 59.94
Audio	MPEG-1 Layer II, Dolby® Digital (AC-3), Dolby Digital Plus (E-AC-3), HE-AAC Mono, stereo, multichannel

BROADCAST VIDEO PROCESSING

Codecs	MPEG-2 MP @ ML MPEG-2 MP @ HL MPEG-4 AVC MP @ L3 MPEG-4 AVC HP @ L4 HEVC Main 10
SD Resolutions and Frame Rates	576i @ 25 480i @ 29.97
HD Resolutions and Frame Rates	720p @ 50 and 59.94 1080i @ 25 and 29.97 1080p @ 24, 25 and 59.94
Up/Down/Cross-Conversion	480i @ 29.97, 720p @ 59.94, and 1080i @ 29.97 576i @ 25, 720p @ 50, and 1080i @ 25 720p @ 59.94 and 1080i @ 29.97 or 1080i @ 29.97 and 720p @ 59.94
Processing Capabilities	Multipass processing Scene-cut and fade/dissolve detection Dynamic GOP managment with adaptive I-picture and B-picture placement CBR, VBR (DToIP)
Video Input Filtering	Motion-compensated temporal filtering (MCTF) Horizontal filter

MULTISCREEN VIDEO PROCESSING

Codecs	AVC (H.264) Main, Baseline HEVC Main 10 60 Hz, 50 Hz
Multi-Machine Synchronization	Split adaptive bitrate encoding across multiple machines
Container	Transport stream over UDP, each video is delivered as a separate SPTS
Aspect Ratio Handling	4:3, 16:9

AUDIO PROCESSING

Codecs	MPEG-1 Layer II, AC-3, E-AC-3, HE-AAC
Level Control	Jünger Level Magic™ audio level adjustment

GRAPHICS & BRANDING

Adobe Creative Suite compatibility
Integrated DVE
Independent branding for each service
Up to 8 layers
Integrated clip playback

PLAYOUT

SCTE automation control
Play from local disk or NAS
Content origination
Digital program insertion
Slate insertion

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