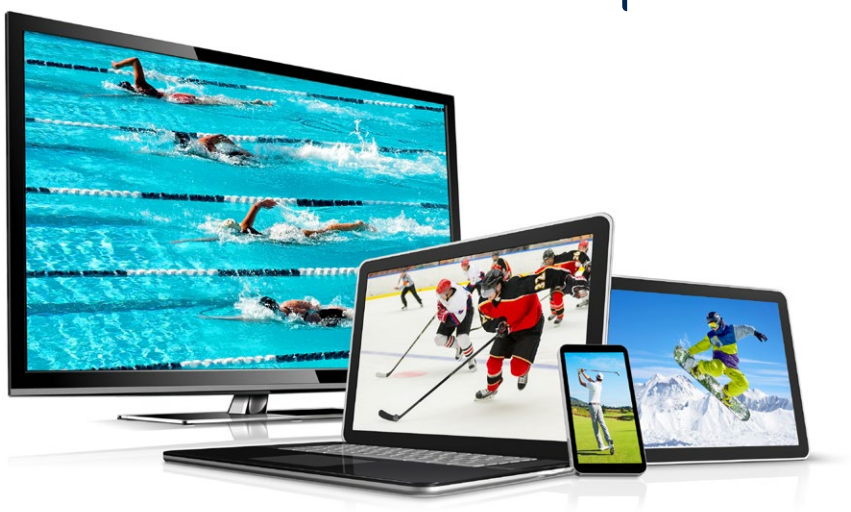
XOS Advanced Media Processor



The XOS Advanced Media Processor is a high-performance live media processor for broadcast and streaming applications.

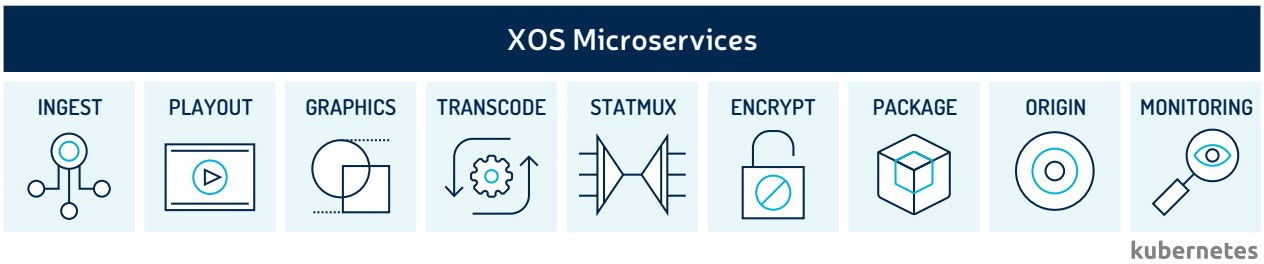
KEY BUSINESS BENEFITS

APPLICATION VERSATILITY

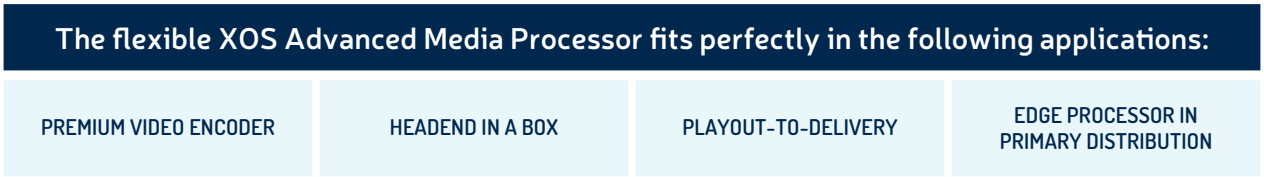
The XOS Advanced Media Processor is the newest generation of Harmonic software-based video appliances for various live TV applications.

Whether you want to transcode SD, HD or UHD HDR TV programs with the highest quality, create TV programs from file assets, or adapt feeds to your delivery network, the XOS Advanced Media Processor can handle them. The XOS Advanced Media Processor is a high-end MPEG encoder, an MPEG multiplexer, a Playout engine, an OTT packager, a professional receiver, a cloud gateway and more.

XOS can perform multiple functions at once to suit your workflow.



The XOS Advanced media processor enhances video experiences through AI-powered video compression and quality optimization. In addition, XOS is key to enabling new services like the introduction of advanced video codecs such as VVC and the manipulation of visually lossless content such as JPEG-XS.



XOS Advanced Media Processor

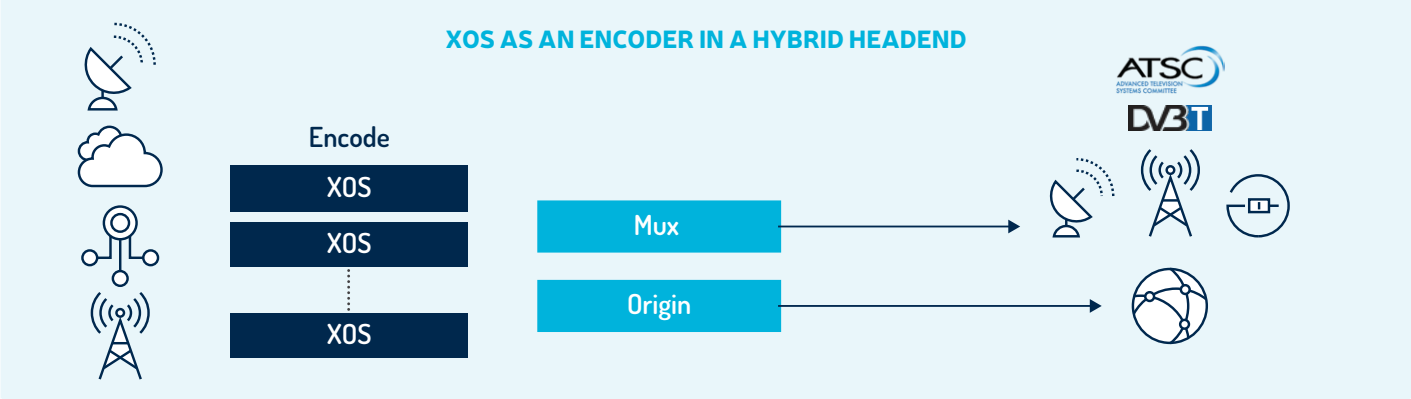
PREMIUM VIDEO ENCODER

Powered by Harmonic PURE™ Compression Engine, the XOS Advanced Media Processor delivers excellent picture quality at any bitrate while optimizing CPU power consumption. XOS lowers video bitrates using AI-based algorithms implemented for all video codecs including MPEG-2, AVC, HEVC and VVC (H.266).

The XOS Advanced Media Processor uses EyeQ™, an innovative technology that can reduce your streaming delivery costs by up to 50% while improving viewer quality of experience. Harmonic EyeQ™ content-aware encoding is fully compatible with standard protocols and players.

For UHD, the XOS Advanced Media Processor is a flawless solution offering multiple UHD 10-bit transcoding within a single 1-RU server.

The XOS Advanced Media Processor supports various HDR technologies like Dolby Vision, HDR10+, and AHDR by Technicolor, as well as HDR10 and HLG standards. It simplifies SDR to HDR conversions and vice versa, seamlessly feeding legacy networks that need SDR from HDR sources, and ensures consistent output formats across different dynamic ranges.



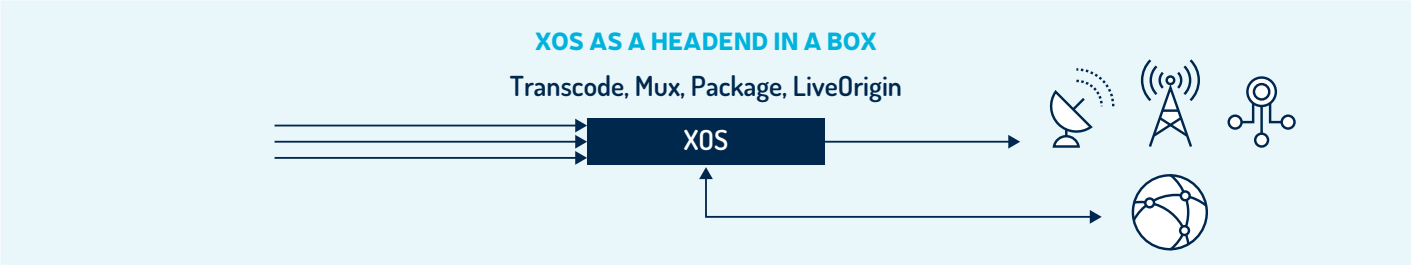
With its unique innovative PURE codec algorithms, XOS delivers the best VQ whatever your bandwidth constraints for large broadcast and streaming Head-Ends.

HEADEND IN A BOX

XOS Advanced Media Processor collapses into a single server all processing modules to deliver a complete terrestrial multiplexer or a small cable head-end.

XOS can connect to EAS systems to overlay crawl text and replace audio in case of emergency alerts, fetch or remux event data for ATSC-1 systems, schedule insertion of station-id logos, protect VQ of most important services in the statistical multiplexing pool, insert cue-tones for downstream ad-insertion or program replacement.

Hybrid workflows are also possible making services available for both broadcast and streaming workflows.



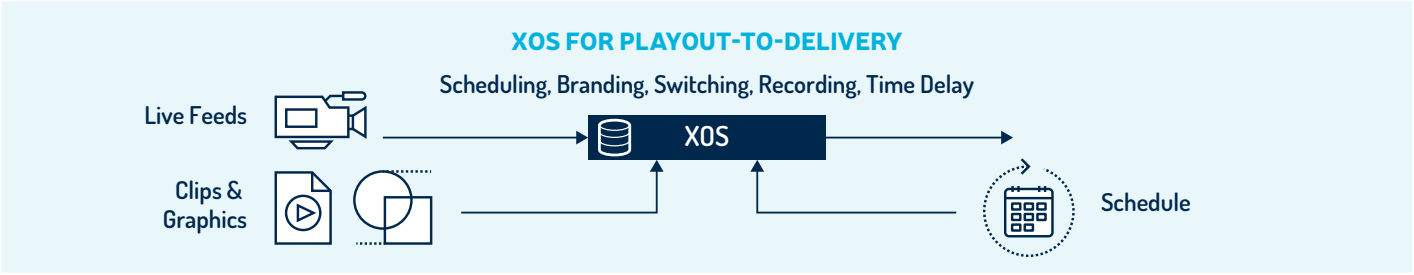
With increase of performance of servers, XOS can perform everything in a box, making it the right choice for small systems such as terrestrial head-ends with or without streaming.

XOS Advanced Media Processor

PLAYOUT-TO-DELIVERY

If you need to launch new TV programs, replace ads, or brand a TV channel, the XOS Advanced Media Processor combines a standard playout engine with a best-in-class compression engine. Thanks to schedules received from standard traffic and automation systems, the XOS Advanced Media Processor can simultaneously receive files and live sources while managing playouts of primary and secondary events.

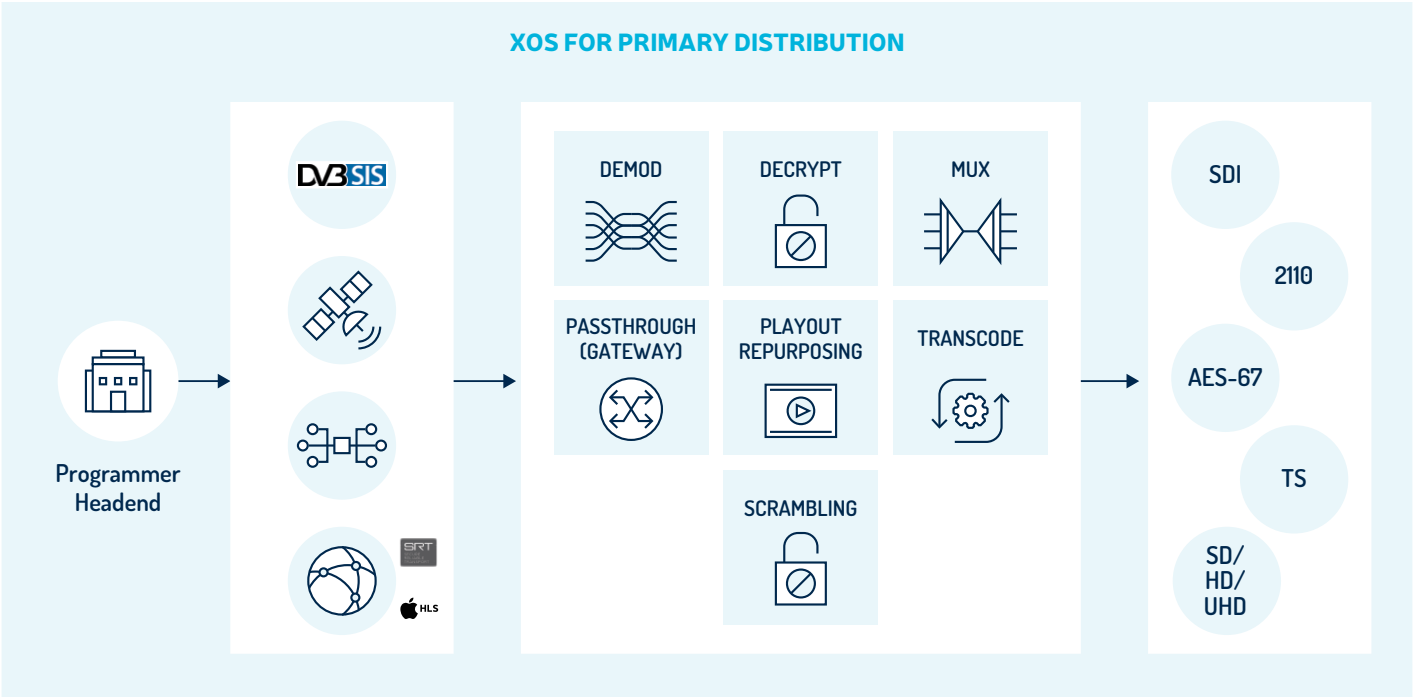
XOS can record incoming compressed stream feeds in a very flexible and reliable way. Files become immediately available for editing or playback. By combining its playout and recording capabilities, XOS is the perfect fit for time delay, disaster recovery, or censorship with compressed outputs.



XOS can create multiple playout channels (up to UHD) based on live streams, clips, and advanced graphics. Recording compressed streams will create new resources that can be used in the playout channels. XOS is a cost-effective solution with switching, encoding, recording, time delay and storage in one box.

PERFECT EDGE PROCESSOR

With its numerous features and wide range of interfaces, the XOS Advanced Media Processor is the perfect choice for small head ends (where everything needs to be contained in a single box) and for Edge decoding, transcoding and customization applications. The XOS Advanced Media Processor connects directly to both cloud and satellite networks.



XOS at the edge enables a versatile, scalable solution that can handle a variety of inputs and deliver any kind of video service. It also allows customization with logo insertion, program replacement, and ad insertion.

XOS Advanced Media Processor

SPECIFICATIONS

LIVE INPUTS

Inputs	MPTS, SPTS, MBTS, RTMP, SRT, HLS, DVB-S2X, ATSC-1, SDI, ASI, VSF-07, 2110, 2022-6, AES-67, Sony NMI, Music Choice/ Stingray radios
Video Inputs	MPEG-2, H.264, HEVC, JPEG-XS, AVS+, AVS2, SONY LLVC 4:2:2 & 4:2:0 Up to UHD resolution
Audio Inputs	PCM, MPEG1 Layer2, AC-3, AC-3+, AC-4, Dolby E, LC-AAC, HE-AAC, HE-AAC v2
Input Features	Source Redundancy, 2022-7, FEC, NMOS IS-04 & IS-05, Input tracking

LIVE OUTPUTS

Live Broadcast Outputs	MPTS, SPTS, SRT, ASI, SDI, ST 2110, COP3 FEC support for TS o IP
Live Streaming Outputs	MBTS, WebDav, AWS S3, RTMP, SRT

DECODER FEATURES

Density	up to 16 channels
Descrambling	BISS2 Mode 1/Mode E/Mode CA, DVB-CI (2 CAMs)
Features	Mute/Video slate on input loss, Inband Control
Optional Genlock	Tri-sync or Black burst
Video Decoding Profiles	4:2:0, 4:2:2, MPEG-2, H.264, HEVC, JPEG-XS
Video Resolutions	Interlaced up to 1080i29.97 Progressive up to 1080p59.97
Down conversion	Any format / frame rate above
Audio	Up to 16 x audio channels per SDI output MPEG1 LII, AAC-LC, HE-AAC V1, HE-AAC V2, Dolby® Digital (AC-3, E-AC-3, AC4), Dolby-E
Ancillary	Closed Caption (CEA-708, 608), Teletext OP-47 (SMPTE RDD-08), SMPTE 2031, SCTE35 to SCTE 104, VANC pass-through, (SMPTE-2038), AFD, VITC time code.

ENCODING FEATURES

Video Encoding Profiles	PURE software engine optimized for AMD/ Intel CPUs 4:2:0: MPEG-2, H.264, HEVC Main10, 4:2:2: H.264, H.266 (VVC), LCEVC
Video Resolutions	Interlaced up to 1080i29.97 Progressive up to UHD (3840x2160p60)
Video Latencies	Standard, Reduced, Short, Very Short
Video Features	Deinterlacer, Frame Rate converter, Up/ Downscaler, Statmux, EyeQ, Dynamic Frame Rate, Slate/Logo insertion, HTML5 Graphic Engine, Video conditioning, Forensic Watermarking, Synchronized encoding, HDR conversions (dynamic & 3D-LUTs), HLG, HDR-10, HDR10+, Dolby Vision (profiles 8.1, 8.4, 5), AHDR by Technicolor, DVB subtitles burn in, time code insertion, WSS/AFD, Cropping, 1-SEG & PIP, ATSC station id logo scheduler
Audio Encoding Profiles	MPEG1 Layer2, Dolby Digital, Dolby Digital Plus, Dolby AC-4, LC-AAC, HE-AAC, HE-AAC v2, MPEG-H 3D
Audio Channels	Mono, Stereo, 5.1, 5.1.4 (Dolby ATMOS), 16 (object based)
Audio Features	Loudness Control, Mixing, Dolby Upmixing, Radio encoding, Fallback audio, Nielsen & Kantar audio watermarking, Dolby E auto switch, Resampling, ARIB
DPI	SCTE-104 (inband & OOB), SCTE-35, DVB-TA Cue tone filtering, External Cue tone normalization, Blackout DTMF cue-tones, GPI
Captions	EIA 608/708, DVB Teletext, DVB Subtitles EIA 608 to EIA 708, ARIB, DVB Subtitles generation, DVB TTML, Speech to captions
Data	ST 2038

PLAYOUT FEATURES

Features	Switching, Branding, Recording, Scheduling, delay line, Clip editor, Clean and dirty
Live feeds	TS/IP, TS/ASI, SRT, RF, SDI
Assets formats	MXF (AVC-I, AVC Long GOP, MPEG-2, XDCAMHD), mp4, TS, MOV
Graphics formats	PNG, TGA, FLV, WebM, HTML5
Playlist format	OPC
Scheduling	Internal automation, Integrated with external automation systems
Branding	Logos, Animations, DVE, Effects, dynamic data, Crawls, RSS feeds, EAS
Triggering	SCTE-104, SCTE-35, GPI, UTC, Manual
Assets storage	Internal storage with HTTP upload, FTPs download and auto fetch from SFTP, NFS, AWS S3, Google GCS, Azure Blob storages

MULTIPLEXING AND SCRAMBLING FEATURES

Signaling	DVB & ATSC from internal generator or external injector
Mux Features	DVB/PSIP Table generator, ATSC EIT remux, Virtual Programs, Statmux, Component Resync, EAS (SCTE-18, EAS-NET), deterministic remux from DVB-SIS data
Scrambling	BISS mode 1/E, BISS2 mode 1/E

PACKAGING & LIVE ORIGIN FEATURES

Media Formats	HLS-TS, CMAF, DASH, MSS, ATSC-3
Captions	WebVTT, TTML, SMPTE-TT
DRM	Multi-Key Encryption, CPIX API
Features	OCR for DVB subtitles to SMPTE-TT, SCTE-35 annotations, Scrambling, Push & Pull packaging, dual track LCEVC

MANAGEMENT

Interfaces	Restful API shared with VOS Harmonic NMX™ Network Management System Standalone Web-based Interface Optional connectable touch-enabled control tablet SNMP for monitoring Prometheus for statistics Inband control from DMS and DMS X ESAM with POIS FTP for assets
Redundancy	Unit Based 1+1 N+M

DEPLOYMENT OPTIONS

Appliance	1RU COTS server Dual PSU AC 110/240 VAC
Appliance options	Cards: up to 24 ASI/SDI, 4 DVB-S2X tuners, 12 ATSC-1 tuners, CI slots, 10G/25G NIC cards Storage: RAID SSD storage up to 23TB System: SSD with RAID1 PSU: 48VDC
Software	As a Linux RPM application

Note: MPEG-H 3D audio software and Production Software for the MPEG-H Audio system licensed from Fraunhofer IIS