



Aquila On-Demand for Cloud

The VOD transcoding solution for clouds

MediaKind Aquila On-Demand for Cloud is a file transcoding and packaging solution designed for clouds

Aquila On-Demand for Cloud is a **new generation** of VOD solution optimized for clouds. It leverages **native cloud** orchestration capabilities (K8S) and supports cloud object storage. Its software design relies on micro-services which are deployed in clouds as containers.

Cloud encoding and packaging capabilities are fine-tuned to offer compelling **premium VOD services**, from the ingest of file assets to the end-user delivery on a full range of devices, with optimal usage of resources.

The solution relies on **3 key pillars**: video quality, performances, and eco-system integration capabilities.

Aquila On-Demand leverages more than **20 years of video compression expertise**, based on in-house codecs, which are also strongly stressed on live systems.

Part of MediaKind's ecosystem, Aquila On-Demand is pre-integrated with **MediaKind's CMS** to expand the scope with assets metadata and workflow management features.

Aquila On-Demand for Cloud benefits

- Designed for **cloud**: native K8S cloud support, cloud object storage support.
- Optimal resources with **orchestrated elasticity** leading to processing costs reduction
- The **best-in-class picture quality** across multiple codecs (MPEG-2, H.264 & HEVC) and resolution up to UHD with continuous enhancement every year
- Stereo and **surround audio experience** as your own personal home theater
- **Centralized operations** across the whole system: configuration, servers assignment, and monitoring
- Ingest via **open REST API**, watch folders that allow a simple eco-system integration
- **OTT formats** delivery (DASH, HLS, HSS)
- **CMAF and CENC** support
- Pre-integrated with **MediaKind CMS**

Deliver a premium experience

Quality-Enhanced Transcoding

Aquila On-Demand integrates unique **in-house codecs**, tailored to provide the highest video quality on each device, from 4K to mobile resolutions.

Aquila On-Demand offers a variety of quality presets that match video quality and encoding speed requirements. Multiple **advanced adaptive pre-processing** techniques are included to enhance input assets while keeping the video sharp: motion compensated temporal filter (MCTF), de-blocking, advanced de-interlacing, adjustable resolutions, aspect ratio management, advanced scaling capabilities, and more.

With Aquila On-Demand we bring the future of immersive experience via ultra HD capabilities, with a wider color space and **10 bit encoding in HEVC**. Aquila On-Demand is also compatible with High Dynamic Range (**HDR**) technologies.

Aquila On-Demand delivers **constant video quality** for OTT by adapting bandwidth allocation to actual complexity, per segment, in order to prevent over-allocating.

Aquila On-Demand checks and adjusts incoming audio levels, and carries up to eight audio tracks per channel. Dolby Digital +, Dolby Digital 5.1 and Dolby Atmos are supported.

Multi-devices delivery

Aquila On-Demand prepares encoded assets for end-user delivery with **(pre)-packaging** functions:

- Just-in-time and encryption with the widest variety of formats and DRMs (pull mode)
- Or pre-packaged content publication to leading CDNs (push mode)
- HLS, Smooth Streaming or DASH are supported

The solution is already integrated with multiple Digital Rights Management (DRM) and Conditional Access System (CAS) providers and can interface with multiple CDNs or cache servers simultaneously.

Cloud native

Orchestrated and Auto-scalable

Aquila On-Demand relies on a **micro-services design**, and is deployed on clouds using a **K8S orchestration** layer which allows the highest flexibility on processing resources: Encoders are spun up and down depending on raw assets ingestion requests. Similarly on the delivery side, just-in-time packagers dimensioning is adapted to the end-users traffic requests load received from the CDN.

Native Cloud Storage

Public clouds provide a new generation of auto-scalable and cost optimized offers. Aquila On-Demand

supports **cloud object storage** at both input and output, in addition to traditional ways to access storages (nfs, sftp, http...).

Advanced Processing

We focus on **optimizing quality and speed**. Our research and development teams have successfully created one of the fastest, high-quality file-based transcoders available today. Our product can **encode files in 25x real time** (depending on the number of outputs and resolutions required).

Optimize metadata and monetize your assets by taking full advantage of ad placement opportunities. With advanced video and audio conditioning, Aquila On-Demand uses **SCTE-35** cue point external metadata to ensure a smooth transition from content to external ads.

High Availability

MediaKind Aquila On-Demand offers a **high available control** plane which ensure a constant access to the solution. Processing nodes are **resilient to failures**, so that a loss of a node is automatically solved by the deployment of a new one.

Dynamic Load Balancing

The **built-in load balancing** capabilities are an essential component of Aquila On-Demand. Resources are requested based on actual needs at the time. Entirely scalable, Aquila On-Demand load balancing ensures automatic and accurate allocation of transcoding and processing resources.

Simplified operations

Centralized Operations

The solution comes with a centralized redundant controller, **single entry point** for all operations such as configuration, control, and monitoring of your whole multi-servers deployment.

Automated workflow

Aquila On-Demand offers an automated workflow that allows encoding and packaging an asset **from a single REST API command**, which dramatically simplifies eco-systems integrations. The same trigger can be done using the watch folder ingest.

Expand the scope

Aquila On-Demand is enhanced with additional MediaKind portfolio components:

- **MediaKind Content Management System** for assets and workflow management which can trigger third-party components for video quality check for instance
- **MediaKind MediaFirst platform** for a full end-to-end TV turnkey offer, as used in Direct To Consumer.

Specifications

Input

Input protocol	Azure blob storage, AWS s3
Input file types	A/V files: MPEG 2 TS (MPTS and SPTS), MPEG 2 PS (.ts, .mpg, .mpeg, ps, .vob), MPEG 4 (.mp4, .m4v, .f4v), MXF OP1-a, Quicktime (.mxfl, .mov)
Input audio and video codecs (decode)	Video: MPEG-2 SD/HD, MPEG-4/AVC (H.264) SD/HD, HEVC 8/10 bits SD/HD/UHD (H.265), IMX, XDCAM (HD & EX), HDV, DV, XAVC, AVC-Intra, ProRes, DVCPro HD SD/HD, JPEG2000, v210 HDR Ingest: PQ10, HDR10, HLG10, HLG10 backward compatible Audio: MPEG 1 Layer II, AC3, E-AC3, AAC, HE AAC and HE ACC v2, PCM, LPCM

File Output

File format (Encoding only)	MPEG 4 and Flash (.mp4) MPEG 2 TS (.ts)
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Packaged Output

Content Publishing	Support for pull scenarios in just-in-time packaging Support publishing to local storage or to WebDAV servers
Origin Server	Built-in live and VOD origin server for HLS, Smooth Streaming and DASH Up to 8000 simultaneous connections Custom HTTP headers management (Expiry settings, CORS headers...)
CDN	Interfaces to leading CDNs Certified with Akamai MSL 4 for HLS / TS and DASH

Pre-Processing

File processing	Progressive ingest, partial file processing
Aspect ratio	WSS; AFD; Video Index
Metadata and VBI	IA 608/708 Closed Caption; DVB Subtitling, Teletext, SCTE-27, SCTE-20, ARIB B.24
Image settings	Brightness; Contrast; Saturation; Hue; Gamma; Temperature
Enhancement filters	Video: De-interlacing, cropping, letter boxing, stretching, 3:2 pull down, MCTF and spatial de-noising, MPEG-2 deblocking, cross-talk filter, diamond denoising, noise edge removal Audio: Loudness Control, True Peak, audio gain adjustment, mute

Video Encoding

	H.264	HEVC	MPEG-2
Video encoding	Baseline/Main/High to HD resolutions 3 encoding presets (ultra-fast, fast, high quality)	8/10 bits to UHD resolutions 3 encoding presets (ultra-fast, fast, high quality)	MPEG-2 Main to HD resolutions 2 encoding presets (high quality, fast)
Rate control	CBR/VBR multi-bitrate with GOP alignment for adaptive bitrate formats	CBR/VBR multi-bitrate with GOP alignment for adaptive bitrate formats	CBR multi-bitrate with GOP alignment for adaptive bitrate formats
Data rate	From 20 kbps to 50 Mbps	From 128 kbps to 120 Mbps	From 256 kbps to 40 Mbps
Resolutions	Ranging from 80x64 to 1920x1080 (1080p) From 50/60 fps to sub-framerate Custom resolutions	Ranging from 80x64 to 4096x2160 From 50/60 fps to sub-framerate Custom resolutions. 8K compatible.	Ranging from 96x96 to 1920x1080 (1080p)
Multi-stream output	Multi-profile output including mix of H.264 and HEVC, interlace and progressive encodings. H.264 and HEVC are compatible with packaged output (MPEG-2 is not compatible).		

Audio Encoding

Audio channels per service	As per licensed authorizations
Audio encoding	MPEG-4/MPEG-2 AAC, HE-AAC v1/v2, MPEG-1 Layer II (not compatible with packaging), MPEG-2 Layer II Dolby Digital (AC-3), Dolby Digital Plus (E-AC3) 5.1-ch or stereo
Pass-through	MPEG-1 Layer II, MPEG-2 Layer II, Dolby Digital (AC-3), Dolby Digital Plus (E-AC3) 5.1-ch or stereo, Dolby Atmos
Data rate	From 32 kbps to 384 kbps (1024kbps for AC3 and E-AC3)

Encoding Post Processing

HDR	PQ10, HDR10, HLG10, HLG10 backward compatible, passthrough and conversions supported Tone mapping (HDR to SDR) and Inverse tone mapping (SDR to HDR)
Subtitle	EIA 608/708 closed caption, DVB Subtitling, Teletext, SCTE-27, ARIB B.24, SRT
Metadata	SCTE-35 pass-through (in-band), SCTE-35 cue point creation (out-of-band)
Dynamic ad insertion	Dynamic ad insertion workflow support from CMS metadata provisioning: assets are conditioned for pre/mid/post roll and cue point metadata are inserted
Logo Insertion	Insert an image from the file (png, jpg)

Packaging

Formatting	Apple HTTP Live Streaming (Over CMAF or TS), Microsoft Smooth Streaming, DASH Common CMAF segment delivery for HLS and DASH
Subtitling	Closed Captions: WebVTT for HLS, DFXP for HSS, WebVTT or SMPTE-TT for DASH DVB-Teletext: WebVTT for HLS, DFXP for HSS, WebVTT or SMPTE-TT for DASH DVB-Subtitles: DFXP for HSS, SMPTE-TT for DASH
Multi Audio	Multiple audio streams per output for HLS, Smooth Streaming and DASH
Content Protection	Microsoft PlayReady DRM support for HLS/TS, Smooth Streaming and DASH Apple Segment for HLS / TS Fairplay support for HLS / TS and HLS / CMAF Adobe Primetime Access support HLS / TS (will be phased out in next version) Widevine, Playready and Marlin support in CTR mode for DASH Widevine and Playready support in CBC mode for DASH Key provisioning interface to leading CAS & DRM vendors

Automated Workflows

REST API / CMS interface	Trigger an asset processing from public REST API. Ideal for CMS integration.
Automated Packaging	Ability to trigger packaging automatically after encoding, without any additional request.
Watch Folder (NFS only)	Drop assets to encode in a folder to trigger the processing. Supports multi watch folder instances, multi destination services, sub-folders and filters on watched files (type, age)

Monitoring and Control

Access	Web UI, API, User profiles and rights management
Alarms	Web UI, SNMP Traps
Control	REST API: Job management, Service configuration, Statistics
Monitoring and logs	Encoding farm jobs monitoring, service jobs, job logs
Reports and stats	Encoding farm reports to track usage of the solution
Reliability	High availability with MediaKind load balancing (1+1 active/active)