



# Aquila Live

## Broadcast and Streaming

### Premium video compression

Aquila Live is the latest solution from MediaKind for streaming and broadcast compression headends, and is built on over 25 years heritage in providing such solutions. It is based around MediaKind's software encoder for both live linear broadcast and streaming applications. It also includes MediaKind's packager, origin server, and transport stream multiplexer / scrambler.

- Wide player and device support for all major segment and manifest formats (HLS, SS, DASH, CMAF)
- The minimum bit-rate required whilst maintaining picture quality whether using MPEG-2, MPEG-4 AVC or HEVC
- SD, HD, 1080P or UHD services, including support for High Dynamic Range
- Wide audio codec support
- Rich subtitles management including ingest of DVB subtitles, teletext and closed caption and their translations for each format
- DRM and broadcast content protection support via CPIX and DVB-CSA standards, including a route to DVB-CSA V3.
- AI Compression Technology (ACT) delivers the best possible quality with available compute with real time content analysis codec optimisation.

### Single solution for all infrastructures

As operating a video headend is not the same for all, Aquila Live Headend can be deployed in different ways:

- Deployed either on:
  - MediaKind reference hardware
  - Dedicated data center hardware
  - Private Cloud infrastructure
  - Public Cloud deployment
  - Optional nCompass control

Through integral industry and technology partner integrations, Aquila Live Headend provides a complete content delivery solution.

Aquila Live from MediaKind is a broadcasting and streaming headend solution which enables broadcasters, streamers and IPTV to minimize costs whilst maintaining picture quality. It can also help improve operational efficiency, and provides a straightforward evolutionary path to all IP workflows, and deployment in private and public cloud.

## Video compression performance

Video quality or compression performance is at the heart of Aquila Live. It allows headend operators to reduce the bit-rate required for each of their services whilst maintaining the picture quality. This can provide significant savings in transmission costs, or allow new services such as UHD channels to be launched within existing transmission network capacity.

MediaKind's video algorithm team continually strive to improve the compression performance, not only on the latest codecs such as HEVC but also on MPEG-4 AVC and MPEG-2. After all the majority of TV services in the world are still encoded using MPEG-2.

## Operational Excellence

Operational excellence is important and it helps provide the 99.999% reliability or better, that consumers expect. With the ever increasing pace of change, areas such as ease of operation, maintenance, upgrade, and the flexibility to easily expand a system in scale or functionality are increasingly important.

The software components within Aquila Live are all designed to be 'cloud native', which means that they are based around a micro-services architecture.

This allows the same components within a system' (or similar) to be deployed as software only, on bare metal, or in a private or public cloud instance. For those who want a traditional, appliance style system, these same components can be deployed on individual servers

Ultimately this means everyone can access the benefits offered by Aquila Live today in the deployment model that suits their needs today, but with a clear evolutionary route to all IP workflows, and even cloud deployment in the future.

## Deployment options

Aquila Live can be deployed as software only, running on standard COTS servers (which can optionally be supplied by MediaKind) or running on cloud instances whether they be private data centers or public cloud instances.

The ability to deploy in cloud environments can enable easy solution software upgrades, easy scaling, and a degree of independence from hardware lifecycles. Additionally deployment in the public cloud makes it possible to scale the solution for events, to test at scale without impacting the on air system, and to provide a disaster recovery system in the cloud.

Configuration management and control is included via MediaKind Controller, or optionally by nCompass Control (purchased separately).

Aquila Live can provide a low risk upgrade path to operators with existing appliance based systems.

Aquila Live targets streaming use-cases ensuring you get the best Total Cost of Ownership and Quality of Experience by leveraging technologies such as:

- **Split and Shared encoding** ensuring that 100% of the infrastructure resources are in use to provide added value to the viewer.
- **Shared CMAF segments and Common Encryption** of HLS and DASH reduce by up to 50% the need of storage in DVR and caching across a CDN.
- **Constant Video Quality (CVQ)** to reduce bandwidth and storage usage without impacting video quality.
- **Low latency OTT** using the CMAF LLC standard and the MediaKind Direct path to lower the end-to-end latency down to approximately 5 seconds.

## Input

	Aquila Live Software deployment
<b>Compressed Input</b>	<p><b>Type:</b> IP (IGMPv3-based redundancy and dual multicast redundancy), Dual source redundancy (active / active &amp; active / passive modes), Pro-MPEG FEC support, Secure reliable Transport (SRT)</p> <p>ASI inputs (max 8 per server) for transport stream multiplexing with redundancy support</p> <p><b>Monitoring:</b> ETR 290, Packet loss statistics</p> <p><b>Protocols:</b> MPEG-2 TS (MPTS &amp; SPTS), RTMP</p> <p><b>Codec:</b> MPEG-2, H.264, HEVC – MPEG-1 LII, Dolby Digital (AC-3), Dolby Digital Plus (E-AC3), AAC, HEAAC v1 and v2, Dolby E (baseband input only)</p> <p><b>Data rate:</b> SD/HD up to 50 Mbps, UHD up to 80 Mbps</p>
<b>Baseband input (optional hardware required)</b>	<p>3G / HD / SD-SDI (max 16 per server)</p> <p>SDI over IP (SMPTE ST 2022-6)</p> <p>SMPTE ST 21 10-20 uncompressed video up to UHD resolution</p> <p>SMPTE ST 21 10-30/31: uncompressed audio</p> <p>SMPTE ST 21 10-40: data (VITC/Time code, AFD/BAR, Closed captioning, OP-47 Teletext, SMPTE 2031 Teletext)</p> <p>All SMPTE ST 21 10 essences can be input as ST 2022-7</p> <p>NMOS IS-04 and NMOS IS-05 support</p>

## Pre-Processing

	Aquila Live Software deployment
<b>Aspect ratio</b>	WSS, AFD, Video index
<b>Metadata</b>	SCTE-104, SCTE-35, IA 608 / 708 Closed Caption, SCTE-20, DVB Teletext, DVB-VBI, SCTE-27, OP47, SMPTE 2031, VITC, SMPTE 2038, ARIB B24
<b>Image settings</b>	Brightness, Contrast, Saturation, Hue, Gamma, Temperature
<b>Enhancement filters</b>	<p><b>Video:</b> De-interlacing, Cropping, Letter boxing, Stretching, SD and HD Cross-scaling, 3:2 Pull down, MCTF, Deblocking filter, Spatial Denoising filter, Cross Talk filter, Sharpening, Diamond filter</p> <p><b>Audio:</b> Automatic loudness control (A/85), Audio gain adjustment, Mute</p>
<b>Image overlays</b>	Image insertion on input loss

## Video Encoding

	Aquila Live Software deployment	Aquila Live Appliance deployment	Aquila Live as a Service deployment
Video codec	HEVC Main 10, HEVC Main Profile, H.264 Baseline / Main / High profile, MPEG-2 HDR: HDR10, HLG10, PQ10. Dolby Vision 8.1 & 5.0		
Rate control	CBR, VBR, Statistical Multiplexing, Constant Video Quality , ACT		
Data rate	From 100 kbps to 60 Mbps <sup>(1)</sup>		
Resolutions	<b>Progressive:</b> from QCIF to UHD, up to 60 fps <b>Interlaced:</b> 480i, 576i, 720i and 1080i		
Multi-stream	Shared and Split encoding for ABR outputs		
Templates	Channel templates creation and management Default profiles templates for SD, HD & UHD services		
Hardware Acceleration	QSV/SG1 encoding up to UHD, H.264, HEVC, MPEG-2 CBR		

(1) Depends on codec and resolution

## Audio Encoding

	Aquila Live Software deployment
Audio channels per service	Up to 8 stereo pairs. Radio Channels
Audio encoding	MPEG-4 / MPEG-2 AAC, HE-AAC v1 and v2, AMR-NB, AMR-WB, Windows Media Audio / Audio Pro, Transcode to Dolby Digital Plus (DD+)
Pass-through	MPEG 1 LII, AC-3, Dolby Digital Plus (E-AC3) 5.1-ch or stereo, Dolby E
Data rate	From 4.75 kbps to 320 kbps (from 64 to 1024 kbps for DD+)

## Metadata

	Aquila Live Software deployment
Subtitles pass-through and translation	EIA 608/708 Closed Caption, SCTE-20, DVB Teletext, DVB Subtitles, SCTE-27, ARIB B24
Ad insertion	EBIF / EISS / AITSCTE-35 pass-through
Nielsen	Watermark extraction for multi-screen devices

## Multiplexing

	Aquila Broadcast Software deployment
Inputs and outputs	<ul style="list-style-type: none"> <li>IP (UDP or RTP) input and output of MPEG Transport Streams</li> <li>ASI input and output (max 8 per server, optional hardware required)</li> <li>RTP re-ordering</li> <li>IGMP V3 redundancy</li> <li>Input bit-rate monitoring and CC error detection</li> <li>SMPTE 2022-1 FEC on input and output</li> </ul>
Processing	<ul style="list-style-type: none"> <li>Full re-multiplexing support including real-time PSI regeneration, and dynamic rules-based pass-through of descriptors</li> <li>PID re-mapping</li> <li>SI/PSI generation/re-generation and insertion from external source</li> <li>Statistical multiplexing bit-rate allocation for MediaKind software encoder</li> <li>Bitrate policing</li> <li>Input Content Extraction</li> </ul>
Content protection	<ul style="list-style-type: none"> <li>DVB-CSA V1, V2 scrambling</li> <li>AES-128 scrambling</li> <li>BISS Mode 0, 1, 2</li> </ul>

## Streaming Output Processing

	Aquila Streaming Software deployment	Aquila Streaming Appliance deployment	Aquila Streaming as a Service deployment
Formatting	<ul style="list-style-type: none"> <li>Apple HTTP Live Streaming (Over CMAF or TS), Microsoft Smooth Streaming, DASH</li> <li>Common CMAF segment delivery for HLS and DASH</li> <li>Low Latency Chunking support for DASH</li> </ul>		
Subtitling	<ul style="list-style-type: none"> <li><b>Closed Captions:</b> WebVTT for HLS, DFXP for HSS, WebVTT or SMPTE-TT for DASH</li> <li><b>DVB-Teletext page 888:</b> WebVTT for HLS, DFXP for HSS, WebVTT or SMPTE-TT for DASH</li> <li><b>DVB-Subtitles:</b> DFXP for HSS, SMPTE-TT for DASH</li> </ul>		
Multi audio	Multiple audio streams per output for HLS, Smooth Streaming and DASH		
Content protection	<ul style="list-style-type: none"> <li>Microsoft PlayReady DRM support for HLS / TS, Smooth Streaming and DASH</li> <li>Apple Segment for HLS / TS</li> <li>FairPlay support for HLS / TS and HLS / CMAF</li> <li>Adobe Primetime Access support HLS / TS</li> <li>Widevine, PlayReady and Marlin support in CTR mode for DASH</li> <li>Widevine and PlayReady support in CBC mode for DASH</li> <li>Key provisioning interface to leading CAS &amp; DRM vendors</li> </ul>		

## Packaged Output

	Aquila Streaming Software deployment	Aquila Streaming Appliance deployment	Aquila Streaming as a Service deployment
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...) Built-in support of HTTP 1.1 Chunked Transfer Encoding for Low Latency		
CDN	Interfaces to leading CDNs Certified with Akamai MSL 4 for HLS and DASH		

## Monitoring & Control

	Aquila Live Software deployment	Aquila Live Appliance deployment	Aquila Live as a Service deployment
Control interface	Up to 2 IP ports, monitoring and control ports (primary and spare) through API & GUI		Access through API & GUI is provided by MediaKind
Control and system protocols	REST, HTTP, NTP, FTP, IGMP v2 / v3, SNMP v2 / 3c		
High availability	Support both 1+1 and N+M redundancy schemes Service synchronization on encoder and packager		High availability managed by MediaKind based on agreed uptime
Content replacement	SCTE-35 in-band / ESAM out-of-band <b>Triggers:</b> Time signal, Splice-out / Splice-in, Alternate command, or manually triggered from GUI		
Licensing	Centralized floating license	Appliance node locked license	Pay per use

## Infrastructure

	Aquila Live Software deployment	Aquila Live Appliance deployment	Aquila Live as a Service deployment
Servers	MediaKind referenced HW IT Datacenter based on COTS servers (DELL, HP, Cisco) Private and public clouds	Aquila Appliances (G8 1056, G8 1026, & M1)	MediaKind selected cloud infrastructure
Option boards	NICs, ASI (multiplexing only), and SDI (encoding only) option boards		
Blueprint deployment	Centralized management and licensing (3x) with processing servers for channels transcoding and packaging	Centralized management with control over the different processing appliances	Per channel deployment managed by MediaKind