Aquila Live Broadcast

Premium video compression

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

- Maintaining picture quality at the lowest bitrates, 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
- Broadcast content protection support via Simulcrypt and the 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

Aquila Live Broadcast can be deployed in a number of 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 Broadcast provides a complete content delivery solution.

Aquila Live Broadcast from MediaKind is a broadcasting headend solution which enables broadcasters 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 Broadcast. 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 and MPEG-4.

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 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 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 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 the MediaKind Hub (public cloud), MediaKind Controller, or optionally by nCompass Control (purchased separately).

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

Aquila ensures you get the best Total Cost of Ownership and Quality of Experience by leveraging technologies such as:

- **Statistical Multiplexing** ensuring that the best picture quality can be delivered in the minimum bandwidth
- **Hardware accelerated live encoding** which delivers low power, high density, and great quality encoding via our optional plugin card.
- **AI Compression Technology** (ACT) delivers the best possible quality with available compute with real time content analysis codec optimisation.

Input

	Aquila Live Broadcast Software deployment
Compressed Input	**Type**: IP (IGMPv3-based redundancy and dual multicast redundancy), Dual source redundancy (active / active & active / passive modes), Pro-MPEG FEC support, Secure reliable Transport (SRT) ASI inputs (188/204 byte) (max 8 per server) for transport stream multiplexing with redundancy support **Monitoring**: ETR 290, Packet loss statistics **Protocols**: MPEG-2 TS (MPTS & SPTS), RTMP **Codec**: JPEG-XS, 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) **Data rate**: SD / HD up to 50 Mbps, UHD up to 80 Mbps
Baseband input **(optional hardware required)**	3G / HD / SD-SDI (max 16 per server) SDI over IP (SMPTE ST 2022-6) SMPTE ST 2110-20 uncompressed video up to UHD resolution SMPTE ST 2110-30/31: uncompressed audio SMPTE ST 2110-40: data (VITC/Time code, AFD/BAR, Closed captioning, OP-47 Teletext, SMPTE 2031 Teletext) All SMPTE ST 2110 essences can be input as ST 2022-7 NMOS IS-04 and NMOS IS-05 support

Pre-Processing

	Aquila Live Broadcast Software deployment
Aspect ratio	WSS, AFD, Video index
Metadata	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
Image settings	Brightness, Contrast, Saturation, Hue, Gamma, Temperature
Enhancement filters	**Video**: 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 **Audio**: Automatic loudness control (A/85), Audio gain adjustment, Mute
Image overlays	Image insertion on input loss

Video Encoding

	Software deployment	Appliance deployment	as a Service deployment
Video codec	HEVC Main 10, HEVC Main Profile, H.264 Baseline / Main / High profile, MPEG-2 HDR: HDR10, HLG10, PQ10..		
Rate control	CBR, VBR, Statistical Multiplexing, ACT		
Data rate	From 100 kbps to 60 Mbps (1)		
Resolutions	**Progressive**: from QCIF to UHD, up to 60 fps **Interlaced**: 480i, 576i, 720i and 1080i		
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		

(1) Depends on codec and resolution

Audio Encoding

	Software deployment
Audio channels per service	Up to 8 stereo pairs. Radio Channels
Audio encoding	MPEG-4 / MPEG-2 AAC, AAC 5.1, HE-AAC v1 & v2, HE-AAC 5.1, 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

	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 / AIT, SCTE-35 pass-through
Nielsen	Watermark extraction for multi-screen devices

Multiplexing

	Software deployment
Inputs and outputs	IP (UDP or RTP) input and output of MPEG Transport Streams ASI input (188/204 byte) and output (188 byte) (max 8 per server, optional hardware required) RTP re-ordering IGMP V3 redundancy Input bit-rate monitoring and CC error detection SMPTE 2022-1 FEC on input and output
Processing	Full re-multiplexing support including real-time PSI regeneration, and dynamic rules-based pass-through of descriptors PID re-mapping SI/PSI generation/re-generation and insertion from external source Statistical multiplexing bit-rate allocation for MediaKind software encoder Bitrate policing Input Content Extraction
Content protection	DVB-CSA V1, V2 scrambling AES-128 scrambling BISS Mode 0, 1, 2

Monitoring & Control

	Software deployment	Appliance deployment	as a Service deployment
Control interface	Up to 2 IP ports, monitoring and control ports (primary and spare) through API & GUI		API & GUI access 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 **Triggers**: Time signal, Splice-out / Splice-in, Alternate command, or manually triggered from GUI		
Licensing	Centralized floating license	Appliance node locked license	Pay per use: hourly or monthly

Infrastructure

	Software deployment	Appliance deployment	as a Service deployment
Servers	MediaKind referenced HW IT Datacenter based on COTS servers (DELL, HP, Cisco) Private and public clouds	Aquila Appliances (G9 1057, G9 1027, & M2)	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	Centralized management with control over the different processing appliances	Per channel deployment managed by MediaKind

Simplify your transition to the cloud with Aquila Live Broadcast