Aquila Broadcast

Premium video compression

Aquila 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 both live linear broadcast and streaming application. It also includes MediaKind's transport stream multiplexer and scrambler. It enables a broadcaster with:

- 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

- Wide content protection support including a route to DVB-CSA V3.

Single solution for all infrastructures

As operating a video headend is not the same for all, Aquila Broadcast 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 Broadcast provides a complete content delivery solution for broadcasters.

Aquila Broadcast from MediaKind is a broadcasting 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 Broadcast. It allows broadcasters 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.

The goal is to deliver at least 10% improvement in video compression performance year on year.

Operational Excellence

Operational excellence is important and it helps provide the 99.999% reliability or better, that consumers expect from broadcast television. 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 Broadcast 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 Broadcast 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 Broadcast 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 Broadcast can provide a low risk upgrade path to broadcasters with existing appliance based systems.

Input

	Aquila 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 (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**: MPEG-2, H.264, HEVC – MPEG-1 LII, Dolby Digital (AC-3), Dolby Digital Plus (E-AC3), AAC, HEAAC v1 and v2, Dolby E **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) SDI over IP (SMPTE ST-2110) with NMOS IS-04 and NMOS IS-05

Pre-Processing

	Aquila 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,
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[1], Deblocking filter[1], Spatial Denoising filter[1], Cross Talk filter[1], Sharpening[1], Diamond filter[1] **Audio**: Automatic loudness control (A/85), Audio gain adjustment, Mute
Image overlays	Image insertion on input loss

(1) Option

Video Encoding

	Aquila Broadcast Software 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 pass-through
Rate control	CBR, VBR, Statistical Multiplexing
Data rate	From 10 kbps to 30 Mbps
Resolutions	**Progressive**: from QCIF to UHD, up to 60 fps **Interlaced**: 480i, 576i, 720i and 1080i

Audio Encoding

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

Multiplexing

	Aquila Broadcast Software deployment
Inputs and outputs	IP (UDP or RTP) input and output of MPEG Transport Streams ASI input and output (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

	Aquila Broadcast Software deployment
Control	Real-time monitoring of alarms and status of MediaKind products. Monitoring of selected third-party products Convenient graphical user interface and API
High availability	Support both 1+1 and N+M redundancy schemes Service synchronization on encoder and multiplexer
Licensing	Centralized floating license (Aquila Subscription or Term based) Appliance node locked license (Aquila Perpetual)

Infrastructure

	Aquila Broadcast Software deployment
Servers	Mediakind referenced HW IT Datacenter based on COTS servers (DELL, HP, Cisco) Private and public clouds
Option boards	NICs, ASI (multiplexing only), and SDI (encoding only) option boards
Blueprint deployment	Centralized management and licensing (3x) with processing servers for encoding, transcoding and packaging Centralized management with control over the different processing appliances Third-party SDI router control