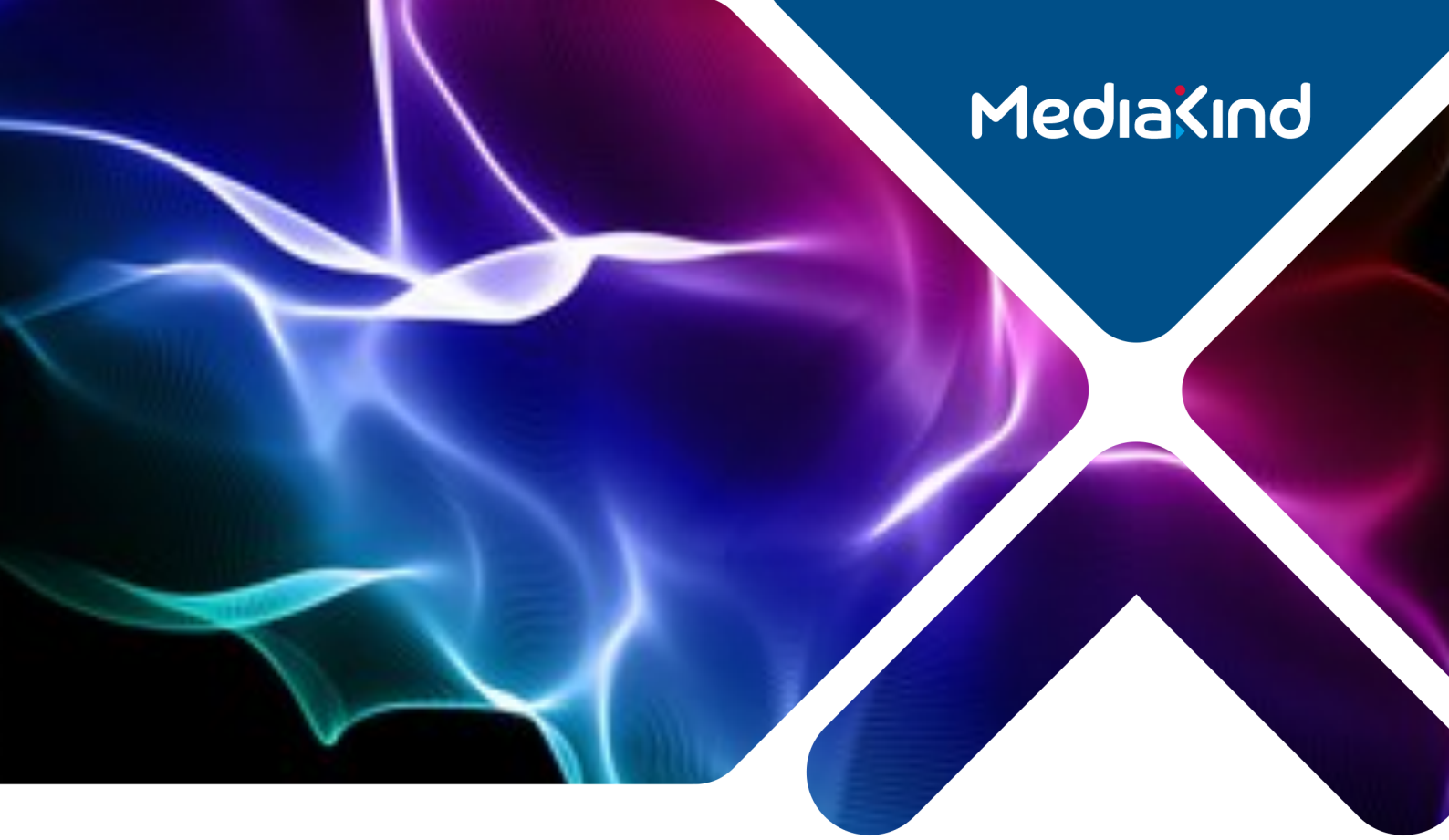


Aquila Broadcast

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 Encoding Live, MediaKind's software encoder for both linear broadcast and streaming application. It also includes MediaInd's Stream Processing, which is a 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.

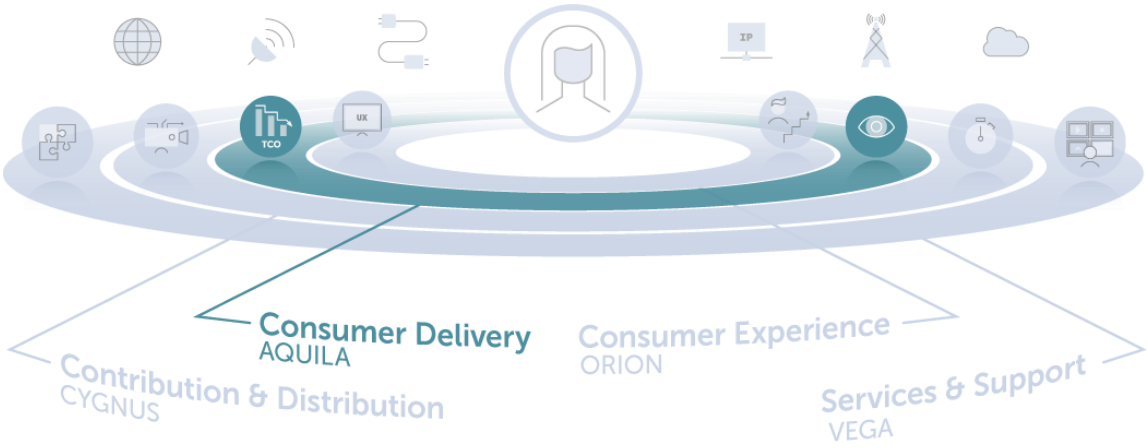
Single solution for all infrastructures

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

- As traditional **Appliances** with control and management provided by MediaKind's nCompass Control.
- As **Software** only, deployed either on:
    - Mediakind reference hardware
    - Dedicated data center hardware
    - Private Cloud infrastructure
    - Public Cloud deployment

Through integral industry and technology partner integrations Aquila Broadcast provides a complete content delivery solution for broadcasters.

MediaKind Universe – Consumer Delivery



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 supplied as appliances.

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.

Appliance Solution

Aquila Broadcast, when deployed as an appliance-based solution is based on previous generations of compression headend solutions from MediaKind. This enables an easy upgrade to the next generation Aquila Broadcast solution. In this deployment model the configuration management and control is provided by nCompass Control which benefits from many years of real world operational deployments.

This demonstrates that Aquila Broadcast can provide a low risk upgrade path to broadcasters with existing appliance based systems.

Software Deployment

Aquila Broadcast can be deployed as software only, running on standard COTS servers (which may or may not 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.

Input

	Aquila Broadcast Software deployment	Aquila Broadcast Appliance 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) **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	SDI over IP (SMPTE ST 2022-6) SMPTE ST-2110	Support for 3G / HD / SD-SDI SDI over IP (SMPTE ST 2022-6) SMPTE ST-2110

Pre-Processing

	Aquila Broadcast Software deployment	Aquila Broadcast Appliance 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	
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	Aquila Broadcast Appliance 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	Aquila Broadcast Appliance 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	Aquila Broadcast Appliance 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	Aquila Broadcast Appliance deployment
Inputs and outputs	IP (UDP or RTP) input and output of MPEG Transport Streams 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 Encoding Live	
Content protection	DVB-CSA V1, V2 scrambling AES-128 scrambling	

Monitoring & Control

	Aquila Broadcast Software deployment	Aquila Broadcast Appliance 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	Appliance node locked license

Infrastructure

	Aquila Broadcast Software deployment	Aquila Broadcast Appliance deployment
Servers	Mediakind referenced HW IT Datacenter based on COTS servers (DELL, HP, Cisco) Private and public clouds	Aquila Broadcast Appliances
Option boards		NICs, ASI, and SDI 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 and third-party routers