

MediaKind Drives Cost Efficiencies For Broadcast, OTT Headend

MediaKind's Aquila media headend software leverages 3rd generation Intel® Xeon® Scalable processors with Intel® Server GPU cards to expand performance at lower cost through lower power consumption.



There is a wave of market and technology shifts affecting both broadcast and over the top (OTT) video service providers which is making a significant impact on their video production infrastructure.

The first shift is the growing number of devices used to consume video. Viewers are continuing to watch video on their primary device - televisions, but also on their mobile phones, tablets and computers. Many viewers are embracing over-the-air (OTA) television as well, pressuring broadcasters to make content available on streaming platforms while continuing to maintain their traditional broadcast channels. This incurs increased costs for broadcasters but doesn't necessarily expand their viewership or deliver additional revenues.

A further trend that challenges video delivery infrastructure is the addition of 4K ultra-high-definition (UHD) resolutions. Broadcasters must support the full range of viewing devices when they roll out UHD programs, and have moved slowly due to this high stakes transition path given the fact that standards for all devices are not finalized. However, this need for across-the-board standardization doesn't impact OTT streaming video companies which have been able to selectively distribute their 4K content. OTT firms can use this flexibility to get around the lack of live UHD content by developing on-demand content streaming plans for higher profile events such as premium video and popular sports. In 2020, more than 384 million consumers worldwide had access to 4K content on their streaming plan, up from 209 million in 2019¹, according to Futuresource Consulting.

Even without broadcasters fully on-board and a lack of certain content, UHD is taking off with sales of 4K televisions increasing. A record 32 million 4K TV sets were sold in the United States during 2020, representing year-over-year growth of 23%².

This growth of mobile device types and high-resolution content is a challenge for video technology delivery infrastructure which is responsible for ingesting, transcoding and either multiplexing or packaging that content for delivery to the consumer. These trends require broadcasters and video service providers to add additional compute power to process the video. The growth of these trends means costly upgrading of this infrastructure. Therefore, providers are continuously seeking ways to enable cost efficiencies that allow them to stay connected with these consumer and technology challenges.

MediaKind, an Intel® Network Builders ecosystem partner, offers its Aquila media headend software technology solutions to provide efficient video consumer delivery running on a specified commercial-off-the-shelf (COTS) server.

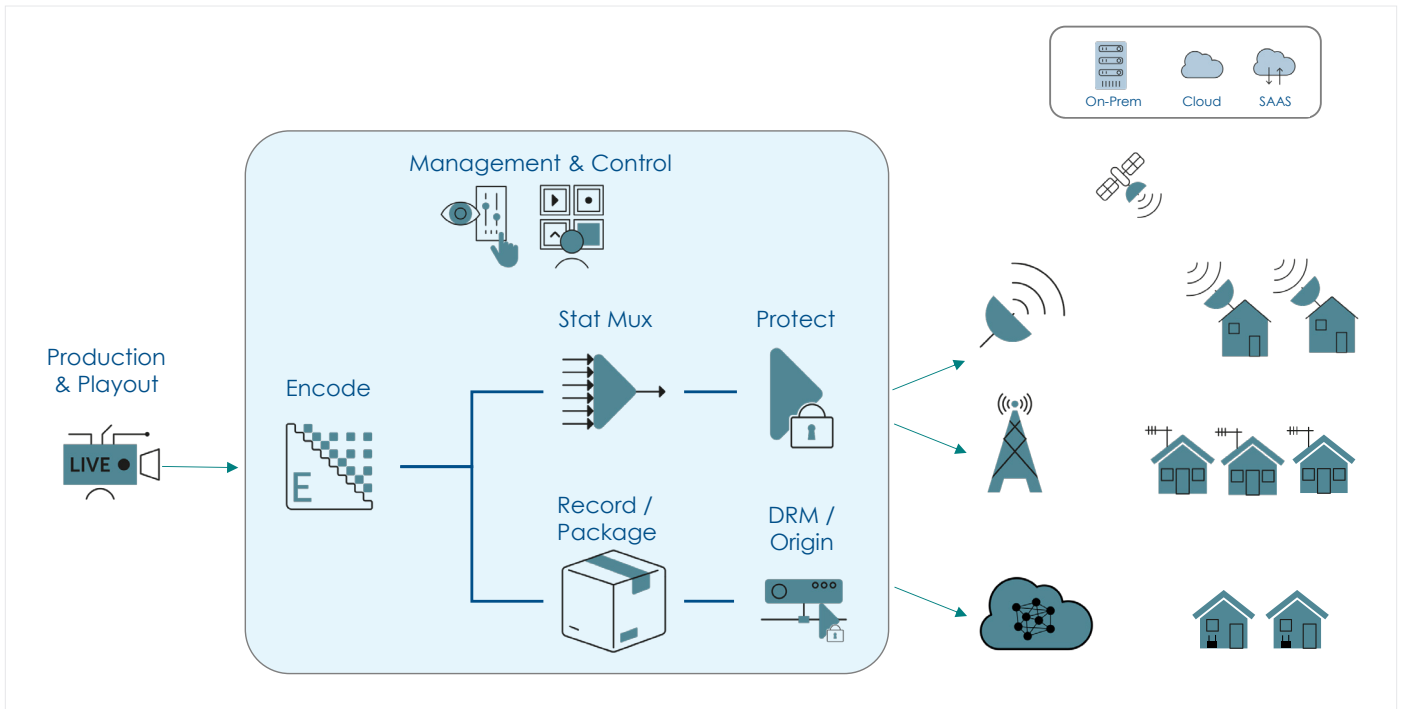


Figure 1. Aquila software workflow.

Aquila Software Offers Flexible Video Headend

MediaKind's Aquila software for video headend applications includes video encoding combined with multiplexing technology for broadcast applications or packaging for streaming applications (see Fig. 1). Both solutions ingest any type of video feed and format and also can dynamically store video on physical and / or virtual storage.

Both software packages can be integrated with a wide range of video codecs supporting MPEG-2, MPEG-4 AVC or HEVC video coding standards. The software features MediaKind's Live Encoding capability that delivers very high video quality across multiple codecs. The software enables SD, HD, 1080P or UHD video outputs, including support for high dynamic range. Both software packages also offer wide audio codec support and have universal device format support for all leading segment and manifest formats.

Aquila Broadcast and Streaming media solutions

MediaKind has developed Aquila using cloud native architecture that breaks up the software functions into microservices allowing them to be scaled up or down independently to suit the needs of delivery operations.

Aquila is designed for an environment that values operational excellence with high availability, ease of operation, and simplified maintenance. It has a cloud native architecture which provides the freedom to deploy on a COTS server or on an appliance.

The live linear broadcast processing capabilities of Aquila Broadcast are designed to deliver high video quality with great

compression performance, allowing broadcasters to reduce the bit rate needed without impacting picture quality. The solution also includes MediaKind's software-based transport stream multiplexer and scrambler which also helps broadcasters to minimize transmission costs. The software's complete IP workflow support includes SMPTE 2022 and SMPTE ST2110.

Aquila Streaming is an end-to-end solution for processing and delivering broadcast-quality video content for OTT and internet protocol TV (IPTV) networks. The software transcodes, packages, encrypts and delivers both live and recorded content to consumers. Aquila Streaming also supports digital dynamic ad insertion to support services monetization and revenue generation.

Aquila Streaming delivers market leading compression to enable video bandwidth savings, low end-to-end latency and storage optimization. This combination delivers all the qualities needed for a premium live video streaming service up to UHD, with the ability to deliver broadcast-quality level experiences across all streaming networks.

MediaKind G8 Series Server Adds GPUs for Performance

The flexibility built into the Aquila solution software extends to its deployment options, which include dedicated data center or cloud hardware, the public cloud or MediaKind reference hardware. Working with Intel, MediaKind has designed the G8 series server with performance, cost, space and power in mind.

The G8 series platform combines 3rd generation Intel® Xeon® Scalable processors with up to two Intel® Server GPU cards to offer both very high throughput and very high cost / density ratio for a low cost per channel.

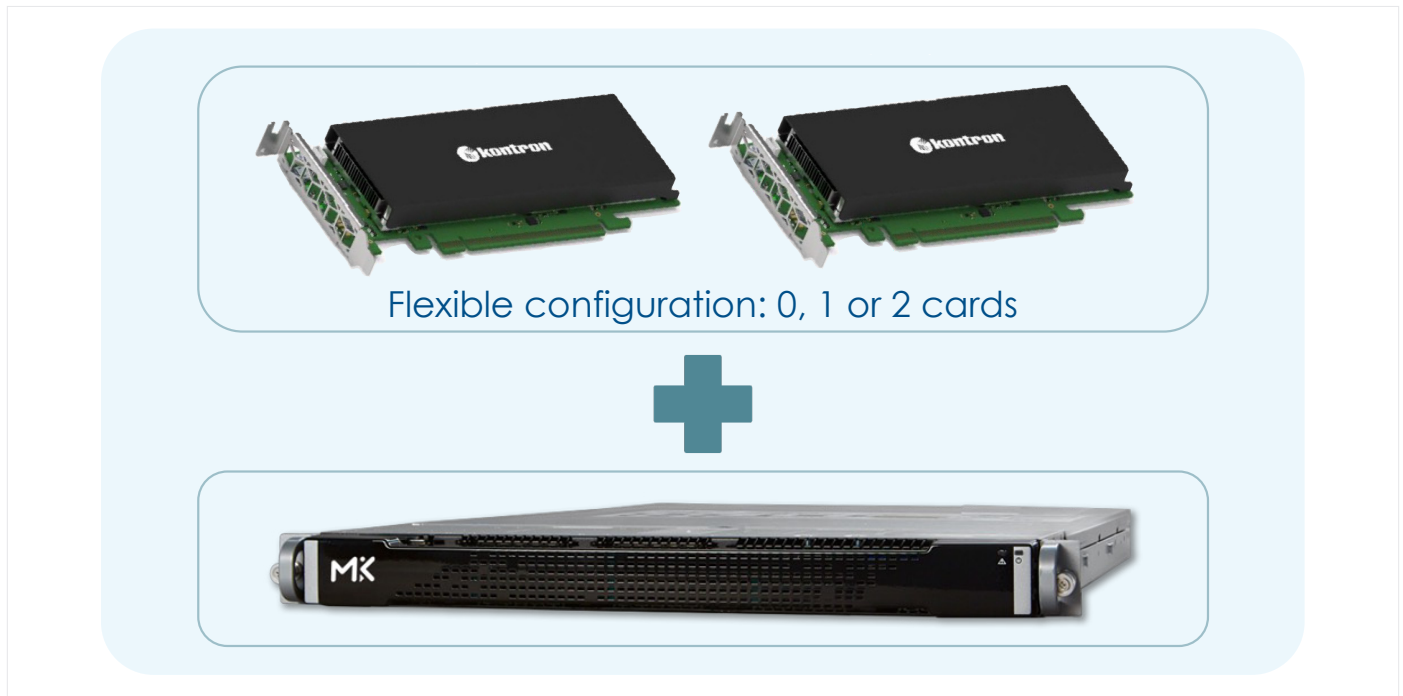


Figure 2. Configuration options for G8 series server.

The G8 series is built using the 3rd Gen Intel Xeon Scalable processor family with between 8 and 40 cores and a wide range of frequency, feature, and power levels. In addition to video transcoding applications, the CPUs are designed for cloud, enterprise, HPC, network, security, and IoT workloads. This processor family offers enhanced gen-over-gen performance and built-in AI acceleration for faster analytics, processing of more images or video streams, and more powerful AI in edge and IoT deployments. Built-in hardware-based security protects critical code and private data from tampering or interception by malware or hackers, a particular challenge in dispersed edge, industrial, or IoT deployments.

The G8 series server is a compact 1RU chassis that offers flexible input/output interfaces supporting 10 GbE or 25 GbE, 3G-SDI and HD-SDI. With up to 16 HD-SDI interfaces per 1RU chassis, the G8 series is a very high density encoding solution for broadcast applications.

The two slots in the G8 series chassis can each support an Intel Server GPU card. These cards are based on Intel's Xe-LP microarchitecture, Intel's most energy-efficient graphics architecture, offering a low-power, discrete system-on-chip design, with a 128-bit pipeline and 8GB of dedicated onboard low-power DDR4 memory. Each card includes two Intel Server GPUs each in a half-height, half-length, PCIe Gen 4.0 add-in card. The cards can feature extensive codec support for MPEG-2, AVC, HEVC, VP9 4K / 8K HEVC 10-BIT.

The MediaKind Aquila solutions leverage code optimizations on Intel® CPUs to perform the highest quality compression and processing for premium content.

Building on Success of G8 Series Server

The current G8 series has been built on the success of the previous MediaKind G8 Series Server, a high-performance video processing server that utilized 2nd generation Intel® Xeon® Scalable processors. This server features a compact 1RU chassis that offers flexible configuration options, with IP (up to 25 Gb), 3G-SDI and HD-SDI input support. With up to 16 HD-SDI interfaces per 1RU chassis, it is the high-density encoding solution for broadcast applications. For service providers, this advanced server platform still provides significant reduction in operating expenses when compared to proprietary competing systems.

Scalability with Lower Cost

By using Intel Server GPUs in a system based on 3rd generation Intel Xeon Scalable processors, broadcasters and video service providers can scale graphics capacity separately from the server count, supporting larger numbers of streams and subscribers per system, at a lower cost (see Table 1).

Before the G8 series, the MediaKind had no support for a GPU card, so service providers could expand their output channels only by adding new servers. But the addition of the GPU cards in the G8 series expands processing without an equivalent increase in cost or power consumption and without a need for additional rack space.

When comparing the performance data for both solutions, MediaKind found that its G8 series with two GPU cards could offer the same performance as a multiple server-based solution for an average of 30% less cost per channel and average of 40% reduction in power consumption.

The G8 series server can provide dual IP input/output management, IPMI remote management support and hot-swappable power supplies, all of which contribute to high service uptime and superior delivery.

SYSTEM CONFIGURATION	PROCESSOR	NUMBER OF SERVERS	COST	POWER CONSUMPTION IN WATTS	COST REDUCTION PERCENTAGE (COMPARED TO STANDALONE G8)	POWER REDUCTION PERCENTAGE (COMPARED TO STANDALONE G8)
G8 series server	Dual Intel Xeon Scalable 6240R processors	28	\$ 196,000	15400	0	0
G8 Series Server with dual GPU cards	Dual Intel Xeon Scalable 6240R processors + Intel® Server GPU card	16	\$ 132,800	9760	-32%	-37%
G8 Series Server with four GPU cards	Dual Intel Xeon Scalable 6240R processors + quad Intel® Server GPU cards	11	\$ 105,600	7370	-46%	-52%

Table 1. G8 series server options required to provide a system capable of supporting 80 channels of HD OTT channels and 80 HD IPTV channels. Testing was conducted by MediaKind in its labs in April of 2022.



Conclusion

Aquila software has been helping broadcasters deliver video content for decades and has been awarded a [Technical Emmy](#) for its high quality. Broadcasters and OTT players demand the highest video quality, but also need their consumer delivery platforms to support viewers and subscribers that are consuming video in new ways and at higher video resolutions.

By utilizing 3rd generation Intel Xeon Scalable processors combined with Intel Server GPU cards, the G8 Series Server can provide a flexible compute platform. With the G8 series, broadcaster and OTT video providers have the performance and flexibility they need to manage a new video consumption landscape.

With the availability of the G8 series, MediaKind has a platform for its Aquila Broadcast and Aquila Streaming software solutions that enable significant channel scalability and cost efficiencies within the same form factor combined with minimal increases in power consumption.

Resources

[MediaKind Aquila Software](#)

[MediaKind G8 series](#)

[Intel® Network Builders ecosystem](#)

[3rd generation Intel® Xeon® Scalable processors](#)

[Intel® Server GPU](#)



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¹<https://www.ibc.org/features/uhd-adoption-a-question-of-perception/7647.article>

²<https://www.ibc.org/features/uhd-adoption-a-question-of-perception/7647.article>

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