

High Density Video Transcoding

Genova^{SPEED}

LIVE MULTISCREEN ENCODER

Keepixo's **Genova Live:Speed** is the latest addition to Genova Virtualizable Software family of products. It runs on the Kontron SYMKLOUD platform and leverages Intel's Quick Sync Video (QSV) technology to dramatically increase transcoding density; minimize power consumption while meeting professional service grade levels.

Media Processing Acceleration

The explosive growth of Internet video traffic has put pressure on video transcoding infrastructures to optimize bandwidth, power consumption and cost of operations. High density transcoding solutions such as Intel's Quick Sync Video technology have emerged to address these challenges. They introduce various levels of HW acceleration to off-load computationally intensive tasks. Initially targeted at consumer applications, high density transcoding has become a viable option for professional transcoding infrastructures when included in suitable packages that address the requirements of professional applications.

Intel Quick Sync Video (QSV) is available on a range of Intel i7 and Xeon E3 processors fitted with on-chip graphics. It provides hardware-based video encoding and decoding acceleration using the embedded graphics engine. First introduced in Sandy Bridge (Intel 2nd generation micro-architecture) in 2011, the QSV technology has evolved over time bringing video quality improvements, higher processing throughput and support for additional video codecs.

Keepixo released its first QSV-enabled product (AL2400) in 2012. AL2400 is a high density video transcoder based on Intel's 3rd generation i7 processor (Ivy Bridge). It is capable of transcoding up to 24 H.264 HD services in a 1U platform while dissipating about 16W per service.

With the advent of Intel's new Broadwell and Skylake micro-architectures, it is now possible to push the transcoding density even further while benefiting from increased video quality and lower power consumption per transcoded service.

Genova Live:Speed

Keepixo worked with Kontron to leverage the Kontron SYMKLOUD Converged Infrastructure platform and developed a comprehensive package that optimizes the performance of QSV and allows smooth deployment of highly dense transcoding infrastructures comprising of hundreds of services.

Keepixo selected the Kontron SymKloud MS2910 platform to implement its high density transcoding solution. The MS2910 platform comes in a 2U (21" depth) chassis, dual hot-swappable 10GbE switches, and can accommodate up to 9 modular compute servers, each hosting 2 independent CPUs for a total of up to 18 CPUs per chassis. The SymKloud compute nodes can be of different mix-and-match processor types to provide flexibility as well as seamless upgradability to newer processor versions.

Keepixo's **Genova Live:Speed** solution is currently available on 2 Intel processors:

- Intel® Core™ i7-4860EQ: quad core processor with Intel® Iris™ Pro Graphics 5200
- Intel® Xeon® E3-1278L v4: quad core processor with Intel® Iris™ Pro Graphics P6300



Keepixo High Density Video Transcoding Implementation

Keepixo's implementation of QSV takes advantage of the HW acceleration available in the CPU graphics engine to offload computationally intensive tasks such as motion estimation and entropy encoding. On the other hand, Keepixo software keeps control of high level encoding tasks such as scene change and field-frame detections which have the highest impact on video quality. Keepixo software also handles other key functions including closed-caption insertion and OTT packaging. Overall, this unique combination of HW and SW operations allows **Genova Live:Speed** to deliver highly dense transcoding infrastructures while meeting the requirements of professional transcoding use cases in terms of video quality and feature set.

The table below provides some performance figures using typical transcoding use cases. Up to 72 HD H.264 services can be transcoded in 1 RU with broadcast grade quality level including video preprocessing such as de-interlacing and de-noising as needed.

CPU type	Core™ i7-4860EQ			
CPU per chassis (2 RU)	18			
Input Format	HD 1080i50	HD 1080i50	HD 720p25	HD 720p25
Output Profiles	1920x1080	1920x1080 1280x720 720x576 480x270	1280x720	1280x720 720x576 480x270 320x180
Number of H.264 services/CPU	7	4	8	5
Total H.264 services/Chassis (2 RU)	126	72	144	90
Total H.264 services/RU	63	36	72	45
Power Consumption/Service	8W	14W	7W	11W

About Keepixo

Keepixo, the spin-off of Allegro DVT's broadcast business, is a leading provider of software-based and cloud-ready head-end solutions for IPTV & OTT. Keepixo offers live encoders, file-based video transcoders and delivery solutions featuring advanced functions such as Catch-Up, Start-Over and nPVR. Keepixo solutions are used by more than 150 customers including 40 tier-1 operators worldwide.

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Conclusions

Keepixo is an early adopter of Intel's Quick Sync Video technology with the release of the AL2400 high density transcoder back in 2012.

Genova Live:Speed software is now available for Intel's 4th and 5th generation micro-architectures (respectively Haswell and Broadwell) and achieves higher transcoding density and improved video quality. Keepixo software implements unique features that further enhance video quality and more importantly make the overall solution suitable for professional transcoding infrastructures. Furthermore, **Genova Live:Speed** is now deployed with **Genova Manager**; a powerful and intuitive service management tool that enables deployment and supervision of hundreds of services.

Keepixo continues to innovate and plans to add support for the newly introduced Intel's Skylake processor to take advantage of HEVC HW acceleration.