4K REAL-TIME STREAMING SOLUTION: SUPERMICRO® AS-1114S-WN10RT SOLUTION WITH NETINT T408 VIDEO TRANSCODERS

The real-time full HD streaming solution with 1/3 of the cost per channel vs. software only encoding approach

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SUPERMICRO

Supermicro (Nasdaq: SMCI) is the leading innovator in high-performance, high-efficiency server and storage technologies and a premier worldwide provider of advanced server Building Block Solutions® for Enterprise Data Center, Cloud Computing, Artificial Intelligence, and Edge Computing Systems. Supermicro is committed to protecting the environment through its "We Keep IT Green®" initiative by providing customers with the most energy-efficient, environmentally friendly solutions available on the market.

Supermicro AS-1114S-WN10RT

Executive Summary

With the birth of the metaverse and interactive streaming video applications such as cloud gaming and video conferencing, streaming video platforms face operational pressure to improve encoding performance and power efficiency while minimizing their environmental footprint.

The Supermicro 4K Video Transcoding Solution future proofs hyper-scale real-time streaming video platforms with higher performance levels than CPU-based software-encoding systems. With NETINT Codensity ASIC-powered video processing units, video services provide can reduce their TCO and server footprint by 5x (80 channels vs. 16 channels) while also reducing carbon emissions significantly as compared to CPU-powered software video transcoders. This increase in encoding density expands the number of channels that can be encoded without increasing the rack footprint. Reduced power and HVAC cost mean a lower TCO and higher density can be achieved without sacrificing video quality or latency.

The Supermicro NETINT Solution

The Supermicro 4K Video Transcoding Solution is built on the Supermicro A+ Server 1114S-WN10RT platform and features advanced encoding capability enabled by ten NETINT T408 Video Processing Units. The T408 VPU is powered by the Codensity G4 ASIC video transcoder and supports HEVC and H.264 video encoding at up to 4K resolution and with 10-bit HDR.

The high throughput of the Supermicro 4K VideoTranscoding Solution enables ultra low latency encoding of 40 broadcast quality 1080p60 streams in a compact 1RU form factor.

Figure 1- Supermicro 4K Real-time streaming solution (AS-1114S-WN10RT and NETINT Codensity T408 Video Transcoder)
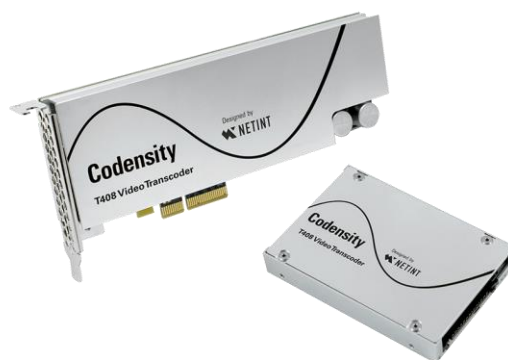

Figure 2 - NETINT Codensity T408 Video Transcoder as PCI-E or NVMe form factor

Key Benefits of Supermicro 4K Streaming Solution

- Ultra-High Density: Ten times increase in video encoding density as compared to the software encoding approach
- Real-Time Encoding: Optimized for live streaming and interactive video applications
- Low Latency: Enables Interactive video applications, including Cloud Mobile Gaming, AR, and VR
- 4K/UHDTV/HDTV: Supports a wide variety of streaming applications.
- HEVC, H.264: Multi-format Transcoding, Encoding, and Decoding support
- Scalable: High capacity encoding throughput for rapid deployment of additional channels (streams).

Total Cost of Ownership (TCO)

The Supermicro 4K Video Transcoding Solution enables a reduction in TCO for hyperscale cloud platforms and video service providers.

Power Consumption

Using Codensity ASIC-powered video processing units, video services, and platforms can reduce their TCO and server footprint significantly. The Supermicro 4K Video Transcoding solution can process 80 streams compared to the software only 16 streams simultaneously, a 5X improvement. The ASIC-powered solution used only 323 watts compared in this test, compared to 460 watts for the software solution, a 30 % improvement. With reduced power consumption, carbon emissions are lowered as well. This increase in encoding density expands the number of channels that can be encoded without increasing the rack footprint. In addition, with reduced power, the HVAC costs are reduced, meaning a lower TCO without sacrificing video quality or latency.

See below for the testing result comparing between traditional x86 server (using 3rd Gen AMD EPYC™ cores) and the Supermicro 4K streaming solution (with 10 NETINT408 modules) while doing the H.264 to H.264 transcoding.
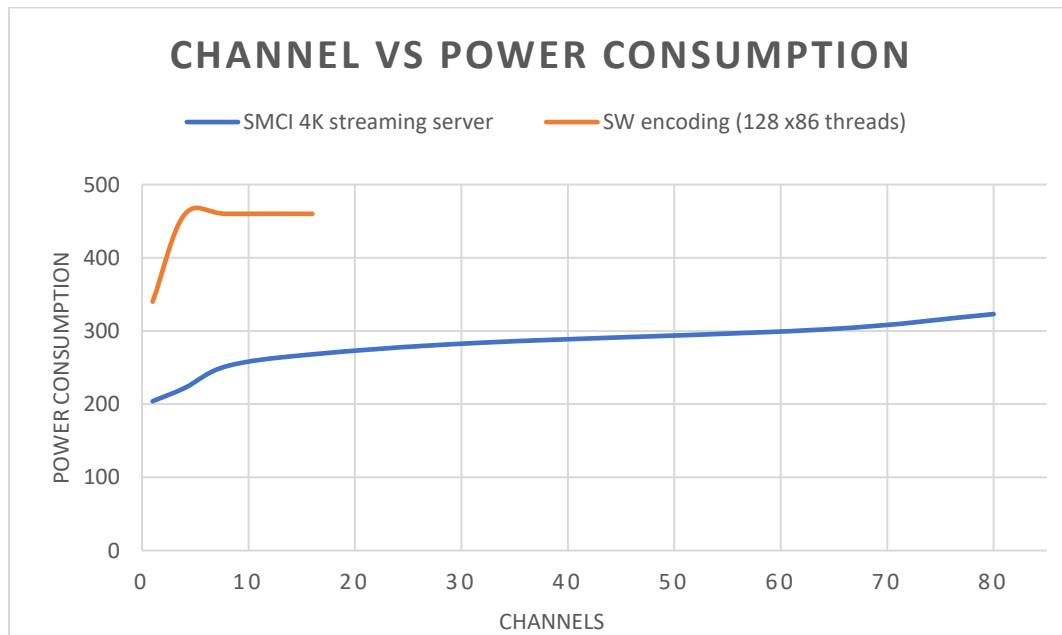

Figure 3 - Power Consumption Comparison of The Supermicro 4K Video Transcoding Solution vs. Software Only

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Channel Throughput

Regarding the video quality and performance, please refer to the below chart. This metric represents the FPS (frame per second) on every single channel. Supermicro 4K streaming Solution can support higher density channels with lower power consumption and performs with a much better FPS rate than the traditional SW transcoding approach. With support for up to 64 channels simultaneously, the Supermicro 4K streaming solution can still support up to 1080p at 32 FPS rate.
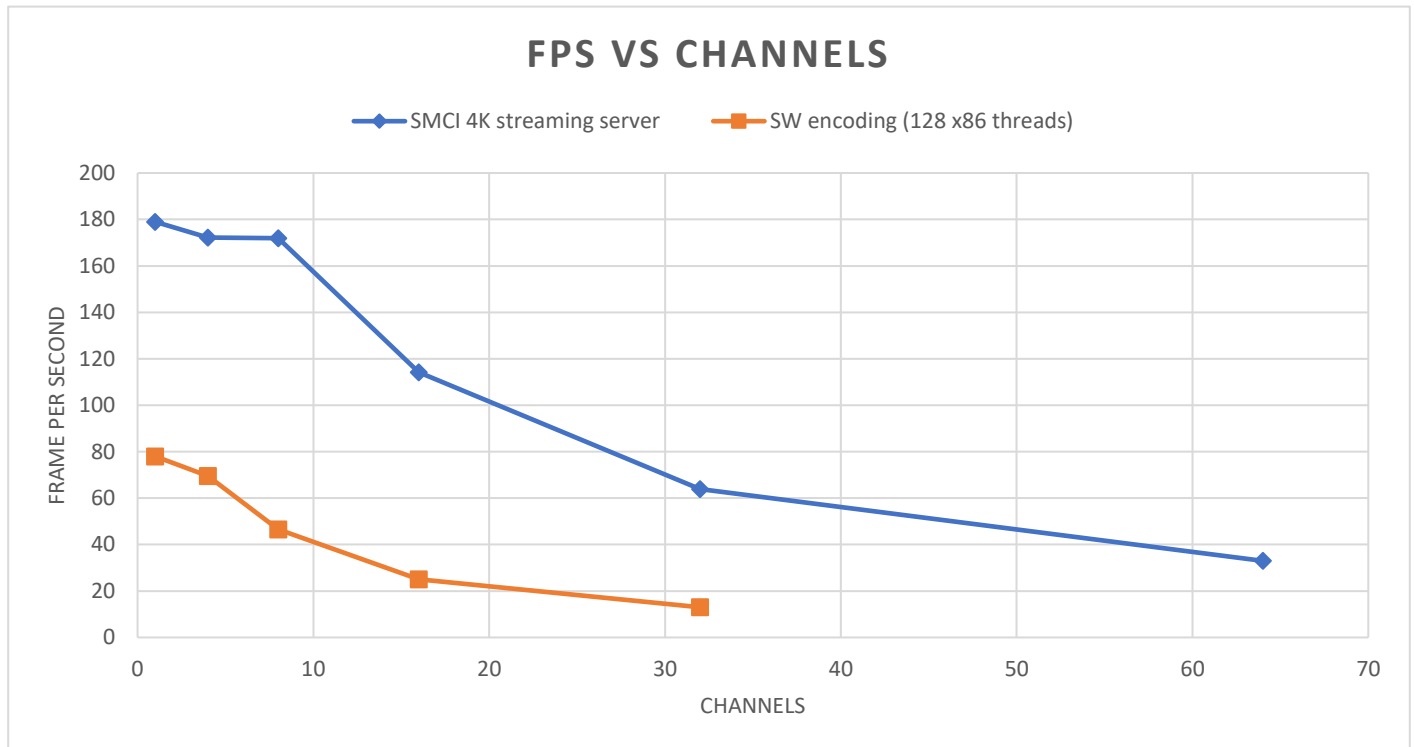

FPS VS CHANNELS

Figure 4 - Performance Comparison of The Supermicro 4K Video Transcoding Solution vs. Software Only

Simple integration

Leveraging FFmpeg, the Supermicro 4K Video Transcoding Solution provides an open-source suite of video processing tools. Video operators can easily and quickly integrate the Supermicro 4K Video Transcoding Solution into their existing encoding infrastructure. Supermicro partner NETINT also provides excellent documentation support such as Quickstart Guide, System integration, and programming guide to help the whole evaluation process. The complete API Guide allows the customer to seamlessly integrate such high-performance, low-cost streaming servers into their systems.

Integrating NETINT's next Gen product, Quadra, with Supermicro system management software is ongoing to provide a more intuitive hardware health status via the Supermicro server Web GUI interface.

Summary

The Supermicro AS- 1114S-WN10RT server with NETINT Codensity T408 Video Transcoder offers a higher performance with less resource requirements than software only 4K streaming solutions that are currently available. It is well-suited for high-resolution video streaming markets showcased by these test results. In addition, the fully integrated system has solved the challenge of high power costs caused by growing video demand. With a workload optimization mindset in mind, Supermicro

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once again brings the faster, better, and greener solution to the market, and $200 for a single High definition channel stream is no longer a dream.

Specifications of the Supermicro AS-1114S-WN10RT with NETINT Codensity T408:
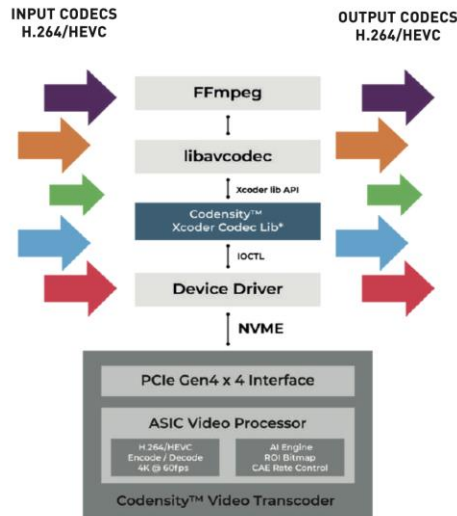
Compute	AMD EPYC™ 7002/7003 Series Processor
Memory	Up to 4TB (16 DIMMS)
NVMe Support	10x
PCI-E Expansion	Up to 3 x PCI-E Slots
Network Options	Dual 10GBase-T LAN
Maximum Power	700W: 100 -140Vac 750W: 200 – 240Vac 750W: 200 – 240Vdc (for CCC only)
Transcoders	10 x NETINT T408
Transcoding Capacity	4K @ 60 FPS | 1080p@240fps x 10 T408 VPUs
Codec Support	H.264 – Encode & Decode H.265 – Encode & Decode

Table 1 - Supermicro 4K Streaming Solution Specifications

Additional Resources

https://www.supermicro.com/en/Aplus/system/1U/1114/AS-1114S-WN10RT.cfm