

## Intelligent SoC Solutions for Computational Storage and Video Processing

### Codensity E408 Edge Fusion Video Transcoder

#### High Density Transcoder with Integrated Storage

Cloud service providers and CDN operators are increasingly motivated to move video storage and processing closer to the edge, to save core network bandwidth costs, improve QoE, while supporting emerging interactive cloud video applications including cloud gaming, AR, and VR. Codensity EdgeFusion is the fusion of NETINT's video processing and SSD storage technologies into a single compact, low power device ideal for video application processing in cloud edge architectures.

Video content is the leading source of traffic on the Internet. Video is often generated and transmitted using the ubiquitous H.264 AVC video encoding standard. Meanwhile, H.265 HEVC video delivers equivalent quality with up to a 50% reduction in file size and bandwidth requirements, making it the codec of choice for newer video end points and devices. Transcoding between these top two video encoding standards is a common requirement for real-time streaming applications and services, however H.265 requires up to 10x the processing power of comparable H.264 video quality, limiting the scalability of software or even GPU-based video transcoding solutions.



#### FEATURES

##### Scalable H.264/H.265 Real-Time Transcoding

##### Leverages NVMe Server Technology

E408 modules designed to plug into NVMe U.2 bays

##### High Density

8K resolution or up to 8x 1080p30 fps streams

##### Integrated SSD storage and Video Transcoding in U.2 form factor

##### FFmpeg-compatible SDK

#### BENEFITS

##### Improves Real-Time

##### Transcoding Economics

Transcode and transrate live video content

##### Integrated storage and video transcoding in one U.2 module.

Ultra high density server architecture, saving rack space

##### Simplified Integration

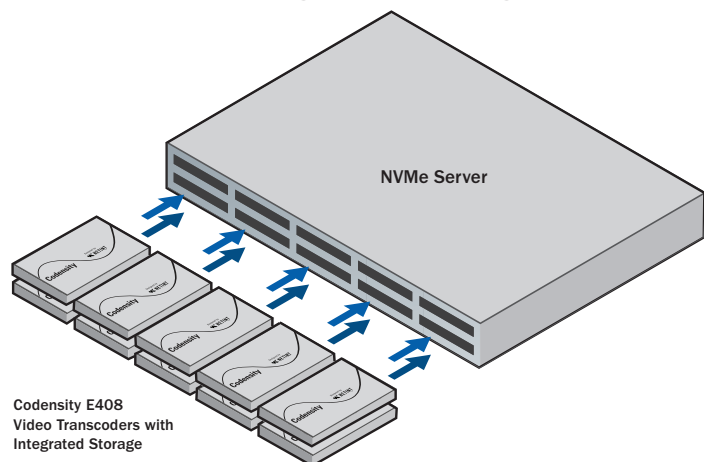
# Designed for cloud transcoding architectures

## High Density Real-time UHD Video Transcoding with Integrated SSD

Codensity E408 modules take full advantage of ASIC-based video processors inside the Codensity G4 SoC technology to support video formats including 8K, 4K or up to 8x 1080p/30 streams per E408 module. At lower resolutions, even more simultaneous streams can be supported. By offloading complex encode/decode algorithm processing inside the ASIC, the E408 video transcoders minimize host CPU utilization. The result is a significant improvement in real-time transcoding density compared to any software or GPU-based transcoding solution. This advanced transcoding capability is complemented by the E408s integrated SSD storage. With up to 3.5TB of storage, the E408 maximizes the utility of every U.2 slot with its unique ability to simultaneously transcode video and read/write data to its onboard SSD. The E408 is a fully integrated video transcoding and storage solution that enables ultra dense server packaging, reducing rack space requirements.

## Integrates into Enterprise-Class NVMe Servers

The E408 integrated video transcoding and storage solution is an ultra efficient architecture that addresses both video transcoding and storage workflow requirements. SSD storage products are increasingly available based on PCIe 2.5" U.2 form factor. Similarly, NVMe was designed as a high performance, low latency, and extensible interface protocol for fast storage I/O. Enterprise-class server vendors have embraced these trends with an increasing variety of storage server products



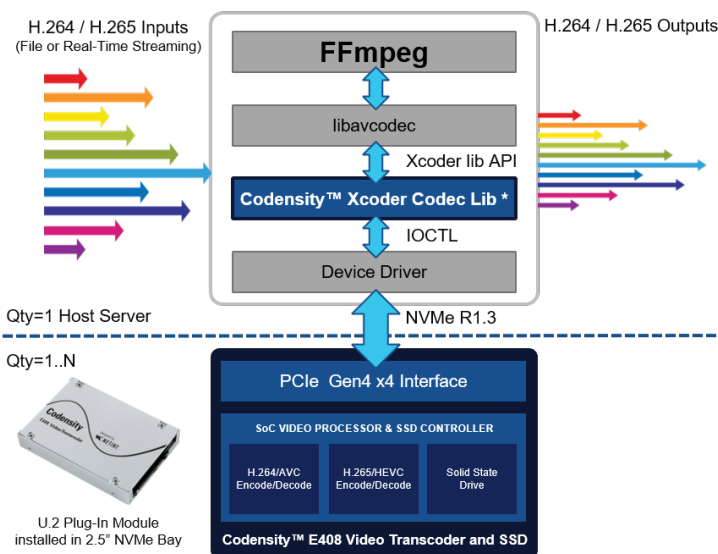
Codensity E408 Video Transcoders with Integrated Storage

A mid-range Intel® multi-core 1U server with 10x NVMe bays can host 10x E408 transcoder modules supporting 80x simultaneous 1080p @ 30 fps real-time transcoding sessions.

designed to host multiple U.2 NVMe bays. The E408 Edge Fusion leverages the capabilities inherent in next generation enterprise class servers by enabling integrating high-performance, real-time encoding and SSD storage together densely packaged in a single U.2 module maximizing the utility of every U.2 slot

## Software Integration with FFmpeg Library Support

Many video processing and transcoding applications developers are familiar with FFmpeg, an open-source software library with a vast suite of video processing functions. The Codensity solution includes a highly-efficient FFmpeg compatible SDK, requiring operators to simply apply a FFmpeg/libavcodec patch to complete the integration. The libavcodec patch on the host server functions between Codensity E408 NVMe interface and the FFmpeg software layer, allowing existing video transcoding applications already using FFmpeg to achieve quick and significant performance and capacity upgrades with Codensity E408 Transcoders.



# Codensity E408 Video Transcoder/SSD Technical Specifications

EdgeFusion E408 – Preliminary Specifications	
Form Factor	U.2 (SFF-8639) 2.5" Width / Height: 15mm
Interface	PCIe 4.0 x4
Protocol	NVMe
Capacity Options	3.5 TB
Sustained Sequential Read/Writes	Read/Write Bandwidth: 4 GB/s   1.4 GB/s Read/Write Latency: 100 µs   20 µs
Random I/O Operations per Second	4 KB Read/Writes: Up to 350K / 50K IOPS
NAND Flash Memory	3D TLC NAND Flash (standard)
Power Consumption (Typical)	Max Read: 11W, Max Write: 24W, Idle: 2W
Advanced Technology	<ul style="list-style-type: none"> <li>Enhanced Power Loss Protection</li> <li>Temperature Monitoring and Logging</li> <li>End to End Data Protection</li> <li>LDPC (Low-Density Parity Check)</li> <li>High Endurance Technology</li> <li>Video Compression Offload Engine</li> </ul>
Life Expectancy	2 million hours MTBF (Mean Time Between Failure)
Lifetime Endurance	Enterprise Grade, detailed number is related to Flash Selection and firmware configuration
Usage	24/7 Operation
Operation Temperature	0 degrees C to 70 degrees C
RoHS Compliance	Meets requirements of European Union (EU) ROHS Compliance Directives

	H.264 AVC Decoder	H.265 HEVC Decoder
Profile	BP / CBP / MP / HP / HP10	Main / Main10
Level	L5.2	L5.1 Main-Tier
Max Resolution	8192 x 4096	8192 x 4096
Min Resolution	16 x 16	8 x 8
Capacity*	4K @ 60 fps 1080p @ 240 fps	4K @ 60 fps 1080p @ 240 fps

	H.264 AVC Encoder	H.265 HEVC Encoder
Profile	BP / CBP / MP / HP / HP10	Main / Main10 / Main Still Picture Profile
Level	L5.2	L5.1 Main-Tier
Max Resolution	8192 x 4096	8192 x 4096
Min Resolution	16 x 16	256 x 128
Capacity*	4K @ 60 fps 1080p @ 240 fps	4K @ 60 fps 1080p @ 240 fps

\* Please contact NETINT for capacity modelling



NETINT Technologies is an innovator of SoC solutions intersecting computational storage and video processing. Its Codensity portfolio enables cloud data centers, edge computing companies, and content providers to deploy scalable high-performance applications, while minimizing their data storage and video processing costs.

NETINT, founded by an experienced team of storage SoC veterans, is a Canadian venture-funded high-tech company with R&D facilities in Vancouver, Toronto and Shanghai, China.

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**For more information, visit [www.netint.ca](http://www.netint.ca)**

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