Cloud Gaming Video Server

NETINT Smart VPU™ ASIC Video Processing Units
Supermicro X13 GrandTwin™ Server

Executive Summary

We created a new category of Smart VPUs (ASIC video processing units) to disrupt the previous limitations of video encoding for streaming delivery platforms. It is unique because it's dense, cost effective and AI-powered making it the ideal technology for platforms to future-proof their services and hyperscale profitably.

Gaming is exploding in popularity as it evolves from console to cloud. Gamers demand access everywhere and on every device, which puts immense pressure on entertainment streaming services to expand their capacity while simultaneously reducing their costs, power consumption and environmental impact.

Smart VPUs are the secret to replacing CPU- or GPU-driven video encoding for cloud gaming platforms wanting to decrease CAPEX per stream by as much 80% and watts per stream by up to 97%*. In this market where margins are razor-thin and competition ultra-intense, the results with Smart VPUs and AI enhancements are profound and transformational.

* SOURCE: bit.ly/ASIC_CloudGaming

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Smart VPUs with AI are the only way to build a profitable cloud gaming platform

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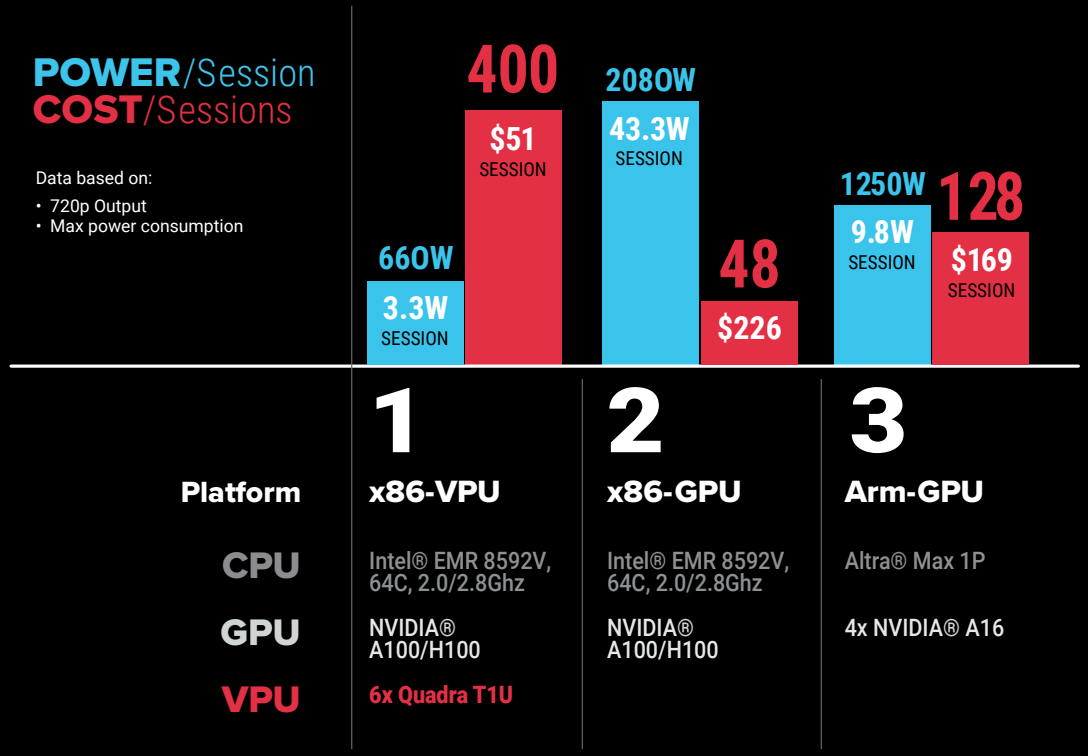
Head to head comparison

Power and cost comparison across 3 encoding scenarios.

Immersive cloud gaming experiences are now economically feasible with an architecture of Smart VPUs for encoding plus GPUs for rendering. You'll get the lowest cost per session gaming platform on the market to bring your streaming service to profitability.



SOURCE: bit.ly/ASIC_CloudGaming

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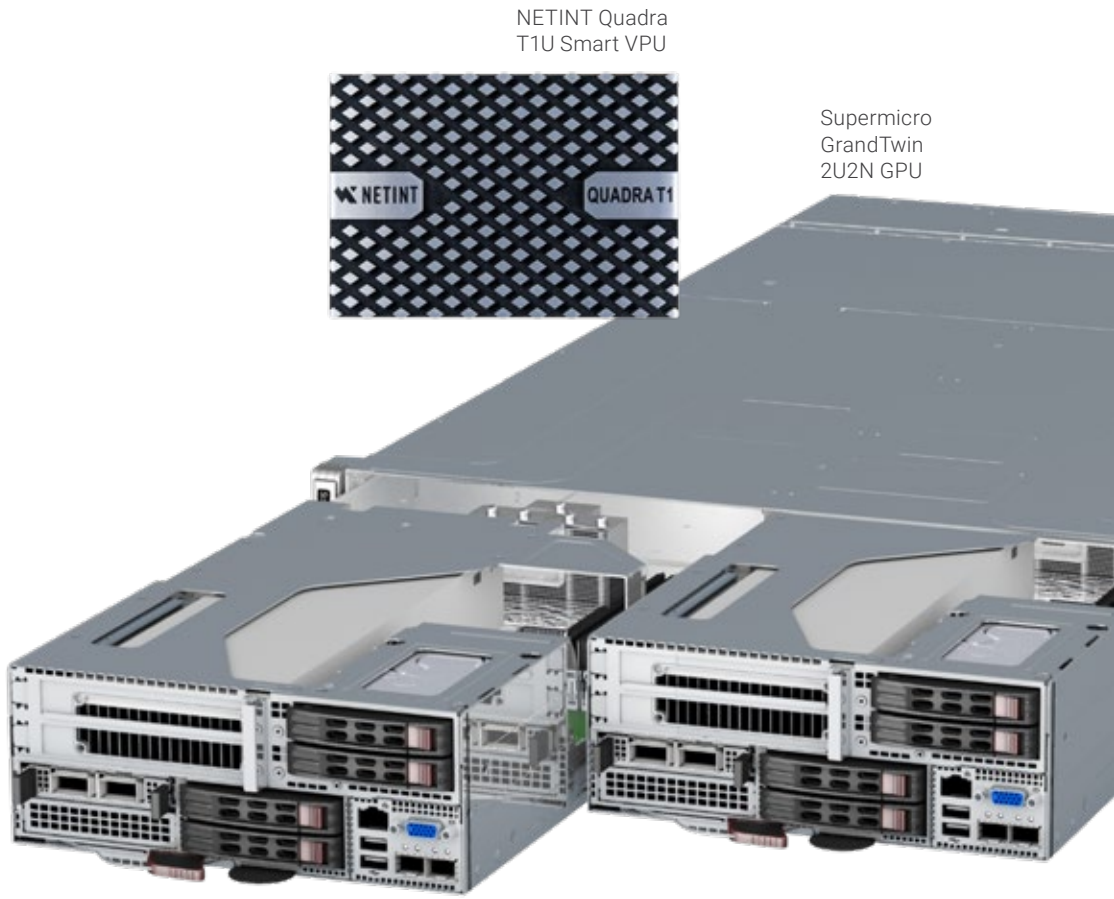
400 gamers in a single session

NETINT with Supermicro now delivers highest gaming density ever!

NETINT Quadra T-series modules are the world's first Smart VPUs that support AV1. With the embedded AI and 2D engines, it can support AI enhanced video encoding, region of interest, and content adaptive encoding. Supermicro X13 GrandTwin server is an AI accelerator. Together, these two super powers provide a powerful cloud gaming platform enabling streaming providers unprecedented high throughput with ultra-low latency to expand services and scale profitably.

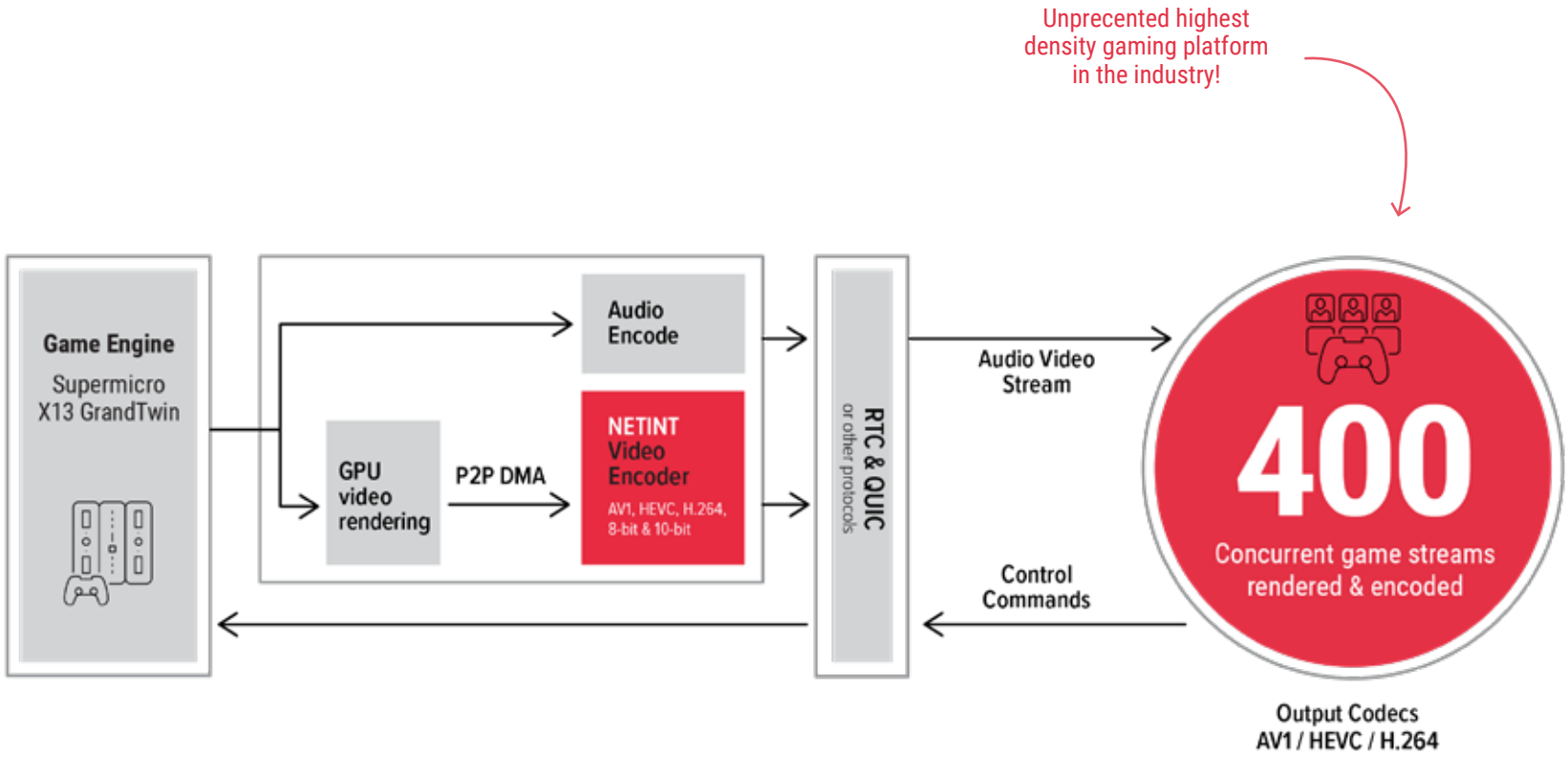
- By offloading complex encoding and video processing to the Smart VPU, host CPU utilization is minimized resulting in a substantial increase in concurrent session density.
- Supermicro has a multi-node architecture optimized for NETINT's single-processor performance. Their resource saving architecture with modular design makes their platform cost effective.

The Cloud Gaming Video Server delivers up to 80% CAPEX reduction and 97% OPEX reduction compared to relevant competitive platforms.



Simple architecture

The Cloud Gaming Video Server leverages P2P DMA for live rendering of complex game graphics encoded in ultra-low latency by Quadra Smart VPUs.



Smart VPUs for cloud gaming

400 Gamers per Session

Unprecedented highest streaming density per session delivers +40x increase compared to software.

Lowest Cost

The industry's most cost efficient server platform with ultra-low CAPEX and OPEX costs.

Wide Range of Formats

Encode up to 20x 4Kp30 live streams and supports a variety of formats in AV1, HEVC and H.264.

Ultra Responsive Latency

Peer-to-peer DMA integration with popular GPUs for the lowest possible latency (8ms) between the game rendering engine and encoder.

Easily Scalable

Simple drop-in upgrade path with enterprise NVMe integration on any x86 or Arm-based server.

Video 2D Processing Engines

Cropping, padding and scaling for encoding ladder generation, image composition, video overlay, YUV and RGB conversion.

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Hardware

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Quadra T1U
Smart VPU

AI powered Video Processing Unit | Codensity G5

Form Factor	U.2
ASIC	1x Codensity G5
Interface	PCIe 4.0 x4
Power Consumption (Typ)	17W
Usage	24/7 Operation
Operation Temperature	0 - 50°C
RoHS Compliance	European Union (EU) ROHS Compliance Directives
Product Health Monitoring	Self-Monitoring, Analysis, and Reporting Technology (SMART) commands Temperature Monitoring and Logging
Video Encoding Standards/Formats	AVC/H.264 Baseline, Main, High, High 10 HEVC/H.264 Main, Main 10 JPG YUV 420 8 bit/10 bit encoding AV1 Main
Video Decoding Standards/Formats	AVC/H.264 Baseline, Main, High, High 10 HEVC/H.265 Main, Main 10 VP9 Profile 0, 2 JPEG YUV 420 8 bit/10 bit decoding
Throughput Capacity	Up to 32x 1080p30, 8x 4Kp30, 2x 8Kp30
Audio Codecs	MP3, AAC-LC, HE-AAC
Level	1 to 6.2 Main Tier
Resolution	32 x 32 to 8192 x 5120
Scan Type	Progressive
Bitrate	64kbit/s to 700Mbit/s
Software Integration	FFmpeg SDKs, LibXcoder API integration
AI Deep Neural Network Engines	15 TOPS AI Assisted Encoding
Region of Interest (ROI)	ROI enables the quality of some regions to be improved at the expense of other regions
Closed Captioning	EIA CEA-708 for H.264 and HEVC encode/decode
High Dynamic Range (HDR)	HDR10, HDR10+, HLG for H.264 & HEVC encode/decode
Low Latency	Sub-frame latency
IDR Insert	Forced IDR frame inserts at any location
Flexible GOP Structure	8 presets plus customizable GOP structure
Video 2D Processing Engine	Crop & Padding/Scaling/Overlay/YUV & RGB Conversion

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Quadra T2A
Smart VPU

AI powered Video Processing Unit | Codensity G5

Form Factor	AIC (HH HL)
ASIC	2x Codensity G5
Interface	PCIe 4.0 x4
Power Consumption (Typ)	40W
Usage	24/7 Operation
Operation Temperature	0 - 50°C
RoHS Compliance	European Union (EU) ROHS Compliance Directives
Product Health Monitoring	Self-Monitoring, Analysis, and Reporting Technology (SMART) commands Temperature Monitoring and Logging
Video Encoding Standards/Formats	AVC/H.264 Baseline, Main, High, High 10 HEVC/H.264 Main, Main 10 JPG YUV 420 8 bit/10 bit encoding AV1 Main
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Cloud Gaming Video Server

Finally, profitable cloud gaming

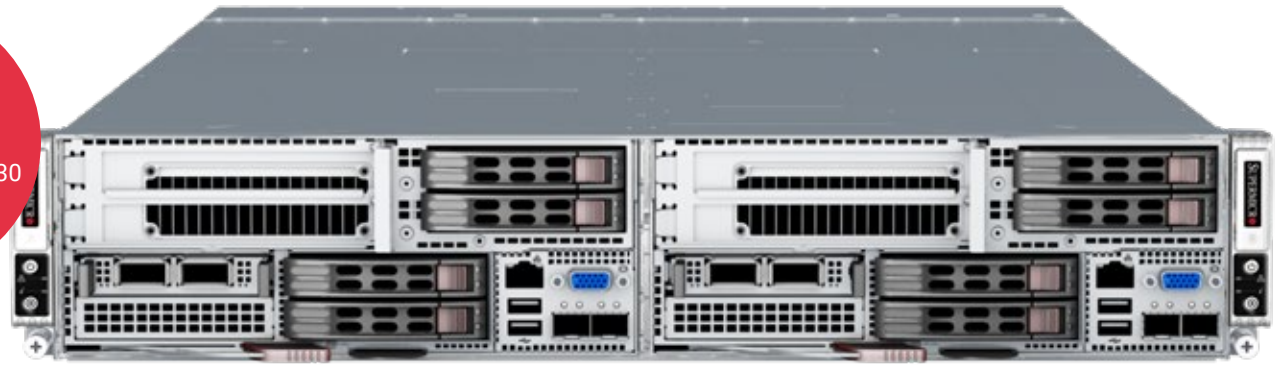
Built on the Supermicro X13 GrandTwin™ server platform, the NETINT Cloud Gaming Video Server boasts multi-node architecture optimized for single-processor performance, ideal for Smart VPUs.

This server supports:

- **Up to 400 720p30 cloud gaming sessions**
- **AV1 / HEVC / H.264 video encoding**
- **Up to 8K and 60fps**

Processor Support	Single 4th Gen Intel® Xeon® scalable processors per node (350W TDP w/ air cooling or liquid cooling)
Memory Capacity	16x DIMM slots, DDR5-4800 memory
Expansion	Up to six 2.5” PCIe 5.0 NVMe per node
Networking	PCIe 5.0 OCP 3.0 compliant AIOM slots. Front I/O module supports 10G/25G NIC, or AIOM(OCP 3.0).
I/O	Front I/O and Rear I/O configurations for data center hot and cool aisle integration and increased serviceability
System Management	Built-in server management (IPMI 2.0, virtual media over LAN and KVM-over-LAN support) with dedicated LAN port. RoT (Root of Trust) ready
Flexible IO	up to 6x U.2 NVMe or SATA drives support. 1x DW FHFL PCIe GPU support
OS Boot Drive	2x M.2 2280 NVMe or SATA slots onboard
System Cooling	4x heavy duty 8cm PWM FANs(two from PSU)
Power Supply	up to 2200W/3000W 1+1 high-efficiency redundant (Titanium level)
Dimensions	H: 3.46” x W: 17.67” x D: 28”

Up to **400** simultaneous 720p30 gaming sessions



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