



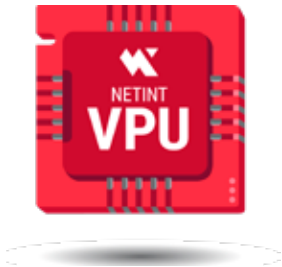
Quadra Use Cases

Advanced Development Applications

Quadra Use Cases

Our customers are comprised of some of the world's most brilliant engineers who leverage Quadra VPUs to solve complex challenges in high-density decoding, large-scale encoding and AI-driven analytics.

While confidentiality agreements prevent us from sharing names of our customers, our engineers are fully engaged in these cutting-edge innovations being deployed for broadcast, cloud, and surveillance applications worldwide.



Advanced Applications

1. VPU Infrastructure-as-a-Service (IaaS) **Akamai**
2. Dense Decoding for Video Surveillance
3. Encoding at the Edge
4. Multilayer AV1 Live Encoding
5. Live Contribution Encoding
6. Multiview Encoding for Live Streaming
7. AI Acceleration for Live Streaming
8. Capped-CRF Encoding in CDN
9. High-end Video Conferencing
10. Cloud Desktop
11. Cloud Android Phone

Cost Reduction Deployments

12. \$8.6 mil CAPEX Reduction **Mayflower**
13. Cost Reduction Deployment **api.video**
14. 50% Hardware Reduction **Zapping**

1

Infrastructure-as-a-Service (IaaS) Akamai Cloud

- Enable high-density encoding in the cloud for general customers
- Monthly subscription services for IaaS on a VPU infrastructure



Plan	VPUs	vCPU cores	Memory	Storage	Network Transfer
Quadra T1U VPU - x1 sm	1	8	16 GB	200 GB	0 TB
Quadra T1U VPU - x2 sm	2	12	24 GB	300 GB	0 TB
Quadra T1U VPU - x1 med	1	12	24 GB	300 GB	0 TB

Quadra delivered:

- Mature and proven high-density video transcoding solution in cloud with a large customer base
- Virtualization with PCIe VF/PF to separate management from transcoding service

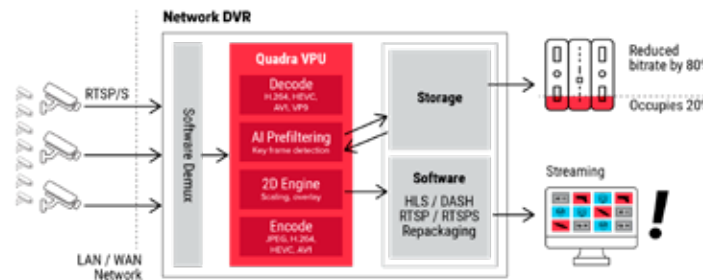
2

Dense Decoding for Video Surveillance

- Bulk decoding manages 100's of incoming camera streams for video walls
- High-quality encoding delivered lower bit rate with same quality (Big cost savings!)
- VPUs generates smaller bitrate streams thereby requiring 80% less deep storage.
- Basic AI features: facial recognition, object detection and classification
- Timestamp text/image overlay
- Live-streaming enables first responders
- Residential, commercial & industrial

48 1080p30 decoded streams per VPU

480 1080p30 streams per 1RU server

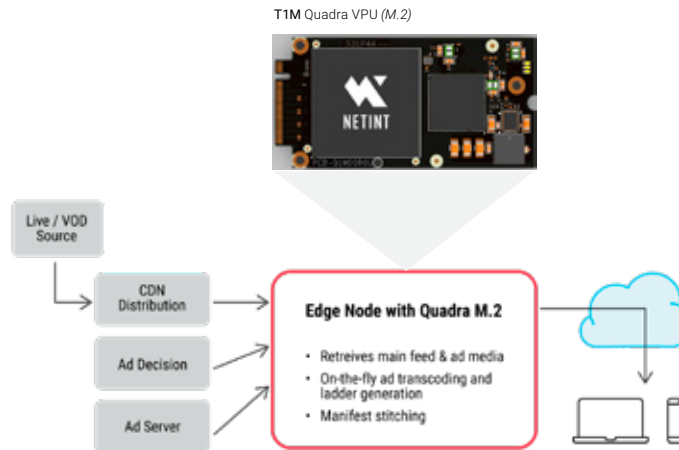


Quadra delivered:

- Bulk decode 48x 1080p30 per VPU & 480x 1080p30 per 1RU server
- Upgraded legacy video system to high-resolution without replacing cameras. with on-chip AI inferencing after capture.

3 Encoding at the Edge

- **Dynamic Ad Insertion:** Customized for different regions with reduced latency
- **Cloud Gaming:** Rendering and encoding at the edge to reduce latency

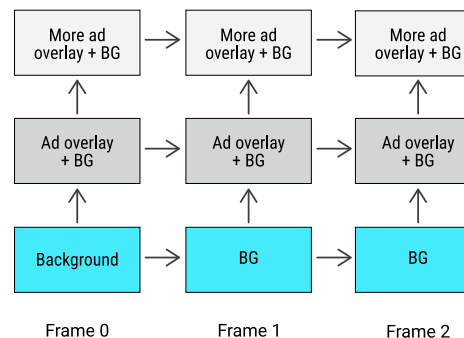


Quadra delivered:

- Quadra VPU in M.2 form factor (T1M) resulting from cooperative development
- High quality and low latency encoding with P2P pull of YUV or RGBA

4 Multilayer AV1 Encoding

- Multiple layers for creative variations of ads and effects

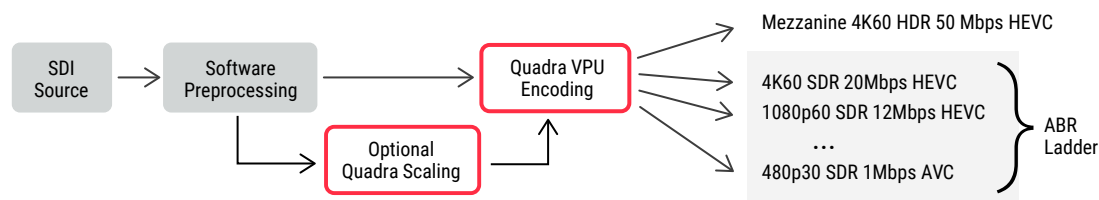


Quadra delivered:

- Up to 4 layers (BL, EL1-3)
- Customizable reference structure
- Realtime 1080p60 performance

5 Live Contribution Encoding

- SDI Source Capture
- Generation of mezzanine stream and ABR ladder at the same time
- Reduced latency and better quality-control compared with cloud ABR ladder generation

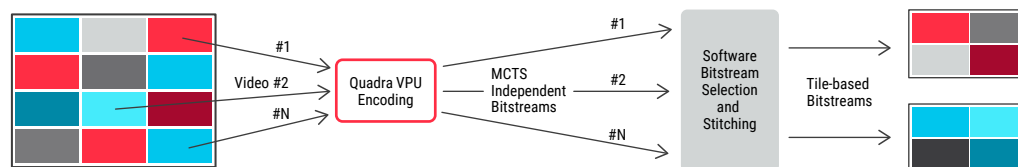


Quadra delivered:

- Affordable high-quality, high density encoding
- Mezzanine Stream Encoding (e.g. 4K60 10-bit HEVC)
- ABR ladder generation (e.g. 4K/1080p/720p/480p with various codecs and bitrates)

6 Multiview Encoding for Live Streaming

- View multiple games simultaneously in user-defined quad split screen
- YouTube, NBA etc have this feature, ideal for fantasy sports, watching and betting

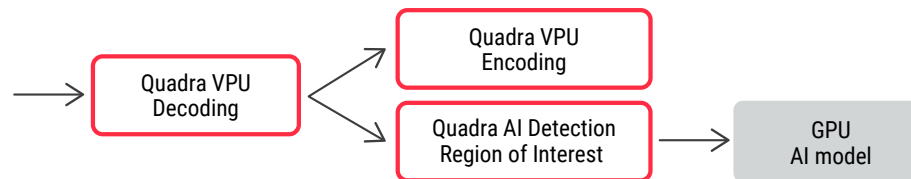


Quadra delivered:

- Stitching 4 independent bitstreams into one tile-based bitstream
- MCTS encoding to prevent motion vectors from crossing tile boundaries
- Encode only once for each stream, not for each combination
- 10 streams can have 210 combinations of 4

7 AI Acceleration during Transcoding

- Assist with AI detection to key regions of interest during transcoding

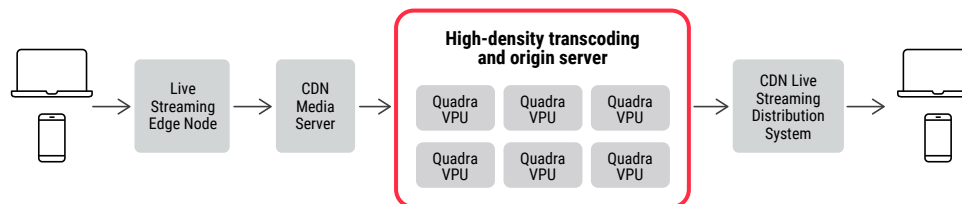


Quadra delivered:

- Region of interest coordinates are fed into GPU that runs more advanced AI models, effectively reducing GPU load

8 Capped CRF Encoding in CDN

- Consistent high-quality, high density with a maximum bit rate
- Ideal for live streaming

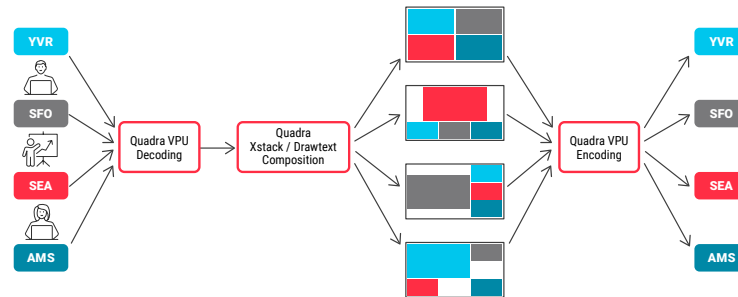


Quadra delivered:

- Tons of optimizations on CRF encoding
- Optimizations on 2D downscaling
- Compatible with super old servers and Linux OSes

9 High-end Video Conferencing

- MCU-based (non-SFU) video conferencing deployed on-premise for enhanced security (Gov, Finance etc)
- Server-side composition & transcoding
- Compatible with a wide range of terminals
- Large-scale and highly reliable

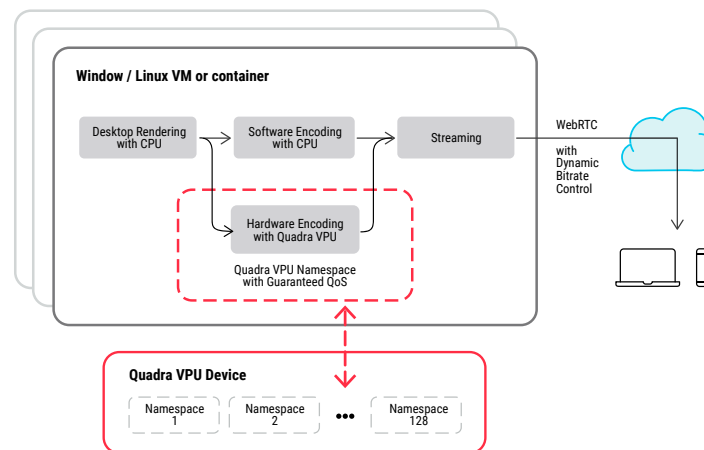


Quadra delivered:

- Composition with xstack and overlay filters
- High-quality, low latency encoding
- Various demo programs to help with integration

10 Cloud Desktop

- Customer can get virtual desktop PCs in cloud
- Compatible with a wide range of Linux/Windows OSes
- Secure and flexible
- No upfront IT hardware investment

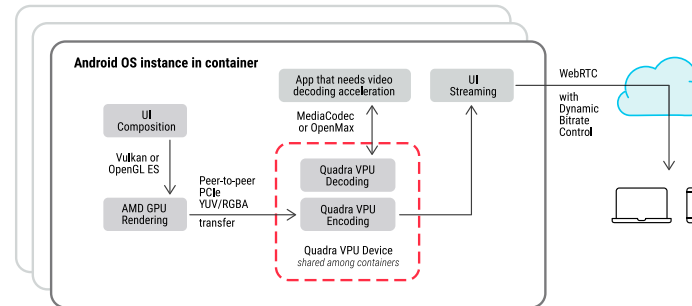


Quadra delivered:

- Virtualization with up to 128 namespaces
- QoS for namespaces
- High quality low latency encoding
- CPU and VPU collaborated encoding

11 Cloud Android Phone

- User can have an Android cloud phone through a mobile app or browser
- Multiple numbers (private/public), multiple identities on one physical phone
- Better security than physical phones
- App fast download
- High-end games on a low-end phone
- Low storage/memory/battery usage

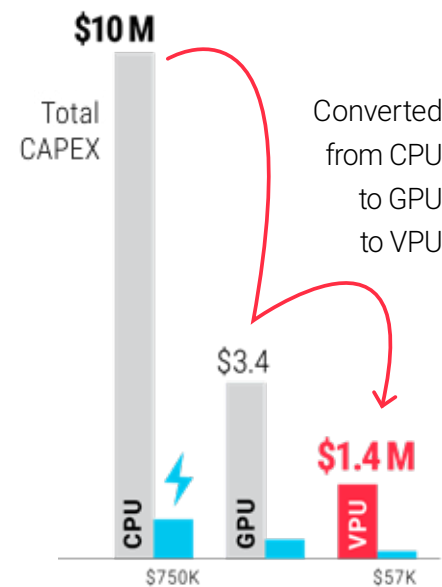


Quadra delivered:

- Vulkan/OpenGL Peer-to-peer (P2P) Encoding with Quadra HW Encoder
- Android Video Decoder Acceleration with Quadra HW Decoder
- Tested with 40 different Android Apps

12 \$8.6 MIL CAPEX Reduction Mayflower

- High-volume UGC live streaming platform of user-generated content
- Saved \$8.6 million in annual OPEX converting to NETINT VPUs after extensive research and deployment from CPUs and GPUs.



Quadra delivered:

- Slashed \$8.6 mil from annual OPEX following migration to VPU from CPU.

13

Cost Reduction Deployment **api.video**

- Live streaming & VOD platform
- VPU enable FREE transcoding!



Quadra delivered:

- VPU conversion dropped their internal cost for transcoding to \$.0002/ min resulting them giving transcoding services away **FREE** to their customers.
- Delightful customer experience = loyalty

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50% Hardware Reduction **Zapping**

- Self proclaimed "King of Live Streaming" and astute CDN provider in LATAM
- VPUs enabled more than 50% cut to hardware footprint and upgraded operational reliability and video quality for live sports and linear channels across LATAM.



Quadra delivered:

- VPUs enabled more than 50% cut to hardware footprint and upgraded operational reliability and video quality for live sports and linear channels across LATAM.

We were first.

We created the VPU category to exponentially reduce costs, shrink server footprint and expand global reach.

100,000
VPUs sold

ONE TRILLION
minutes streamed



sales@netint.com
netint.com