

Choosing Transcoding Hardware

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Agenda

- The Problem
- The Options
- The Results
- The Solution

**Live streaming
experiences are
seeing rapid
adoption**

Insatiable appetite of video consumers

A black and white photograph of two young women sitting on a stone wall. The woman on the left has long blonde hair and is wearing a dark jacket over a light-colored top. The woman on the right has curly dark hair and is wearing a light-colored t-shirt. Both are looking down at their smartphones.

2021

Volume of social video viewing surpassed the volume of Google search traffic.

> 1 billion

Monthly users active on short-form video apps

A grayscale photograph of a server room. Several tall server racks are visible, filled with various electronic components and cables. The room has a tiled floor and a grid ceiling with recessed lighting.

Question:

**What Do I
need to
consider, to
meet
customers
needs?**

There are two constants:

A grayscale photograph of a server room. In the foreground, a server rack is visible, filled with various electronic components and cables. The racks extend into the background, creating a sense of depth. The floor is made of large, light-colored tiles.

Question:

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- Rackspace

A grayscale photograph of a server room. In the foreground, a server rack is visible, filled with various electronic components and cables. The racks extend into the background, creating a sense of depth. The floor is made of large, light-colored tiles.

Question:

**What Do I
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There are two constants

- Rackspace
- Power



Problem:

**Density
is dirty
expensive
problem**

20%

Typical portion of annual OPEX budget spent powering data centers. **Expensive.**

8000

World total data centers, operating 24/7, whose collective consumption is expected to double by 2025. **Power hungry.**



Question:

**What are my
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Three Options:

- **CPU**
- **GPU**
- **VPU (ASICS)**

Determining Factors



Determining Factors

- Quality

Determining Factors

- Quality
- Low Frame

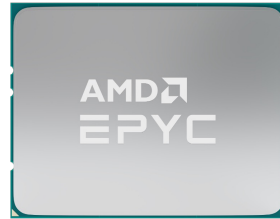
Determining Factors

- Quality
- Low Frame
- Server Capacity
 - Cost per Stream

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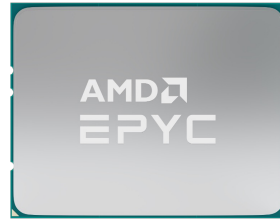
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- Power Consumption
 - Power per Stream

Hardware Comparison

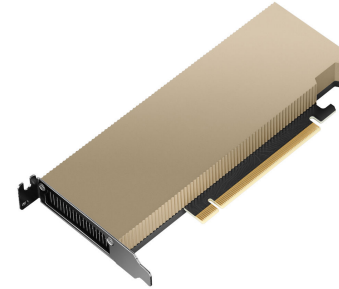


AMD EPYC 32-core

Hardware Comparison

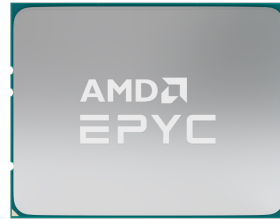


AMD EPYC 32-core

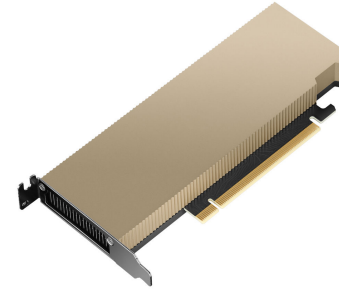


Nvidia L4

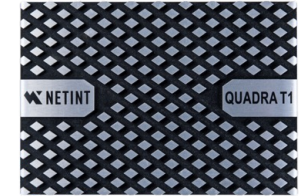
Hardware Comparison



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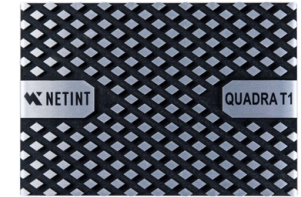
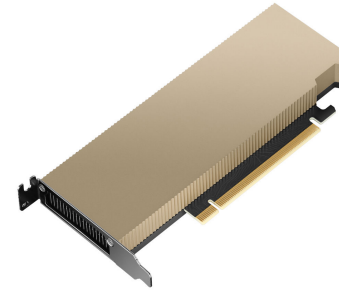
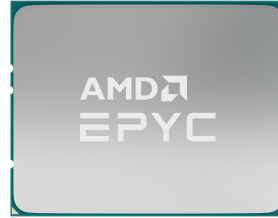


Nvidia L4



Quadra T1U

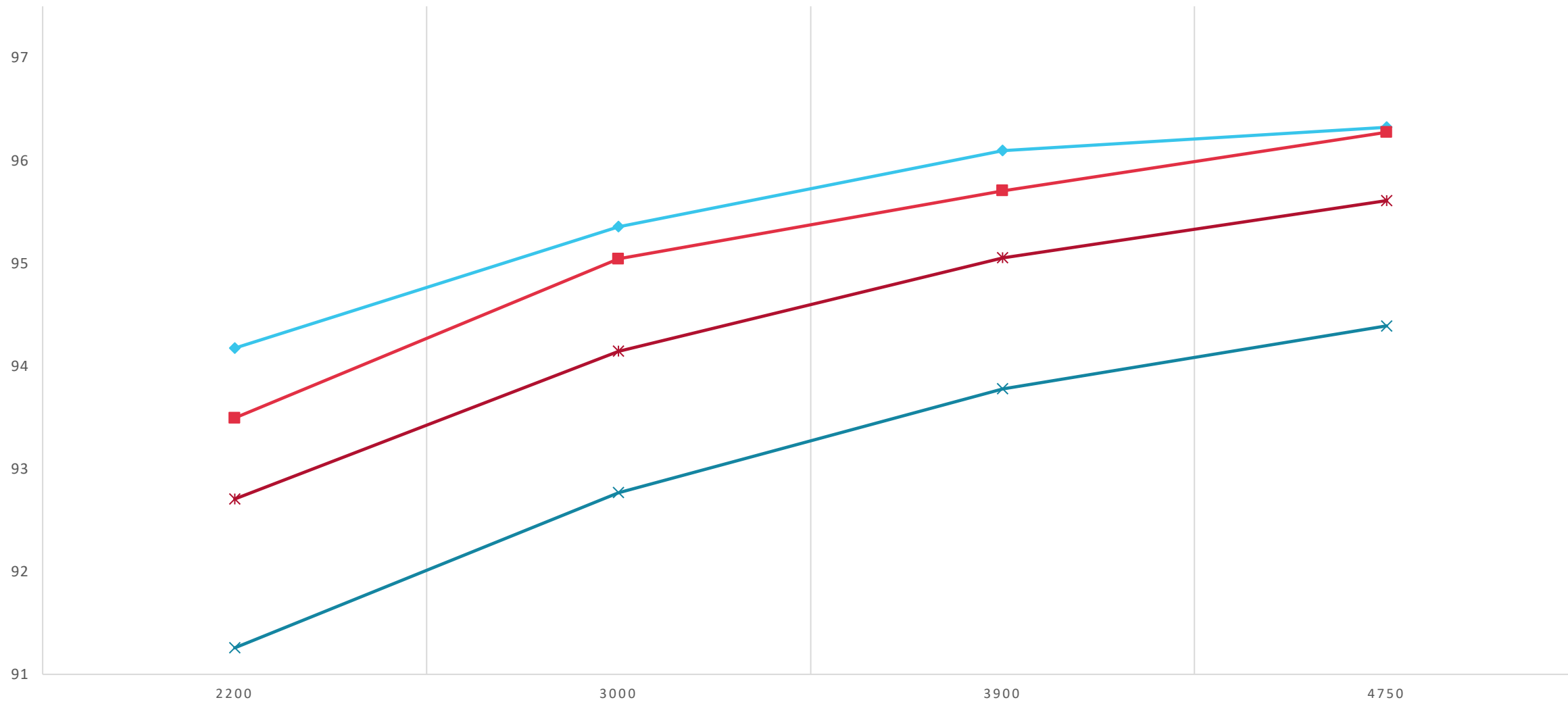
Hardware Comparison



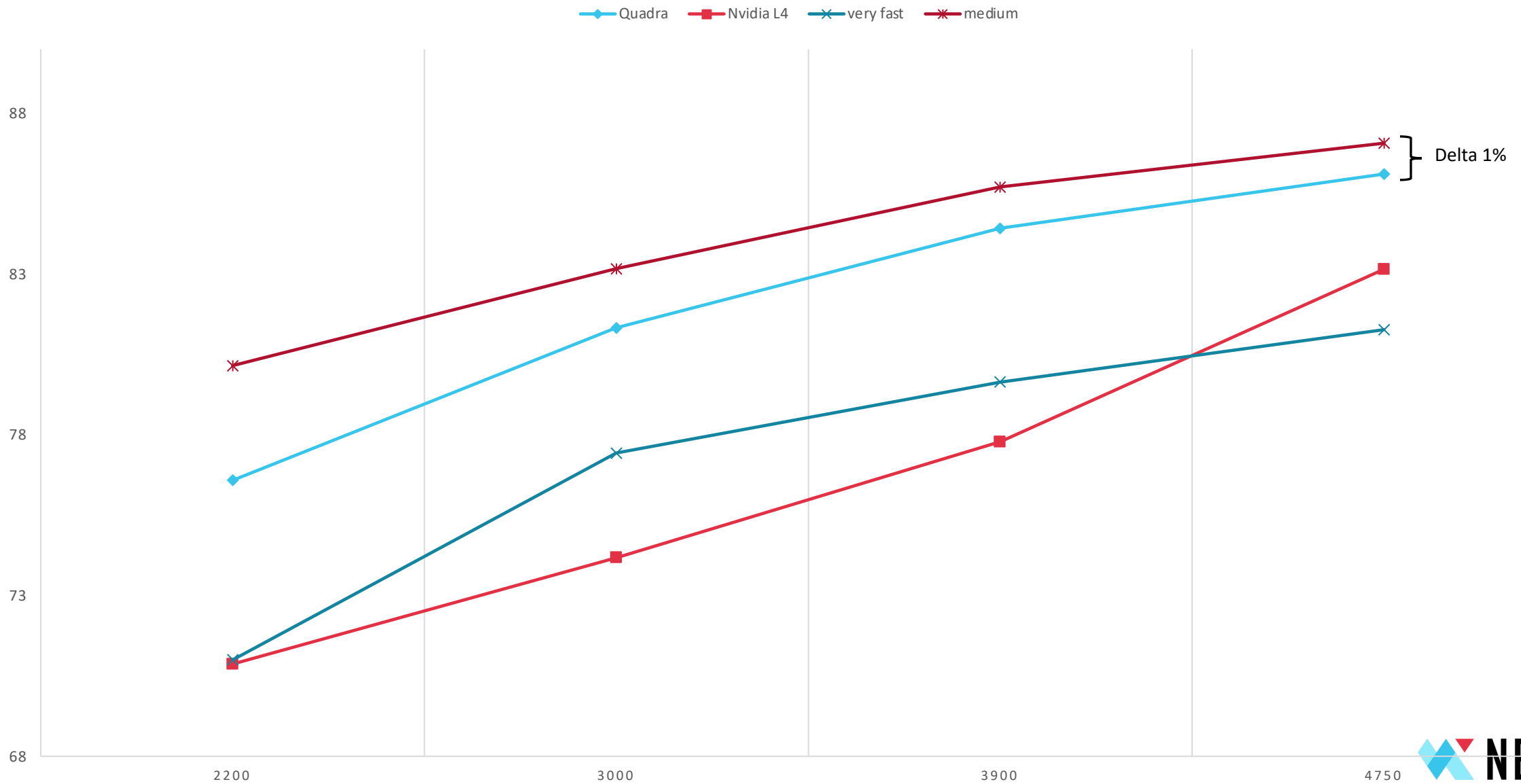
- Codecs (H.264/HEVC)
- Quality using VMAF
- Low Frame
- Capacity
- Power
- Single File (Meridian)

Quality – H.264

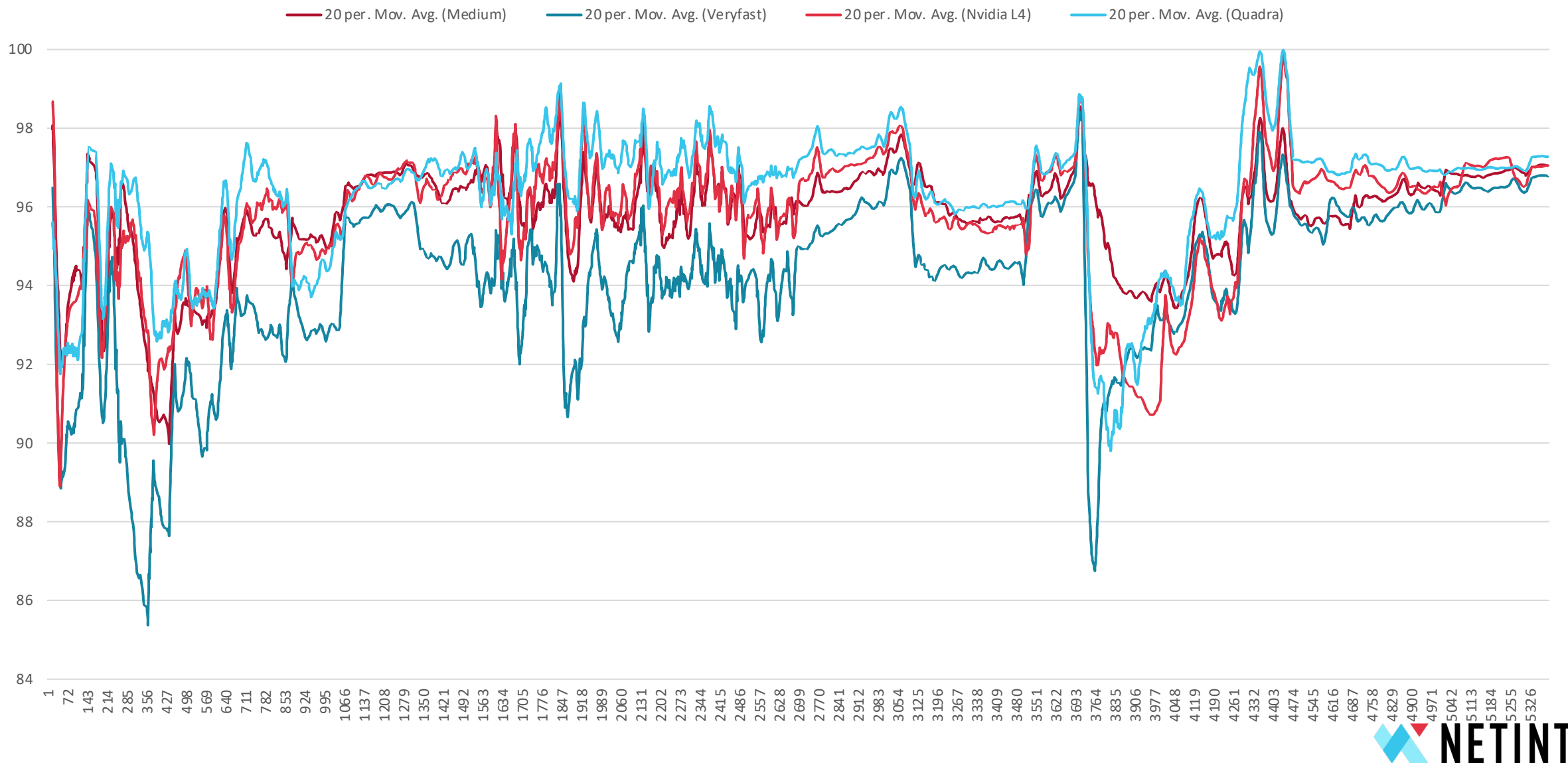
—◆— Quadra —■— Nvidia L4 —x— very fast —*— medium



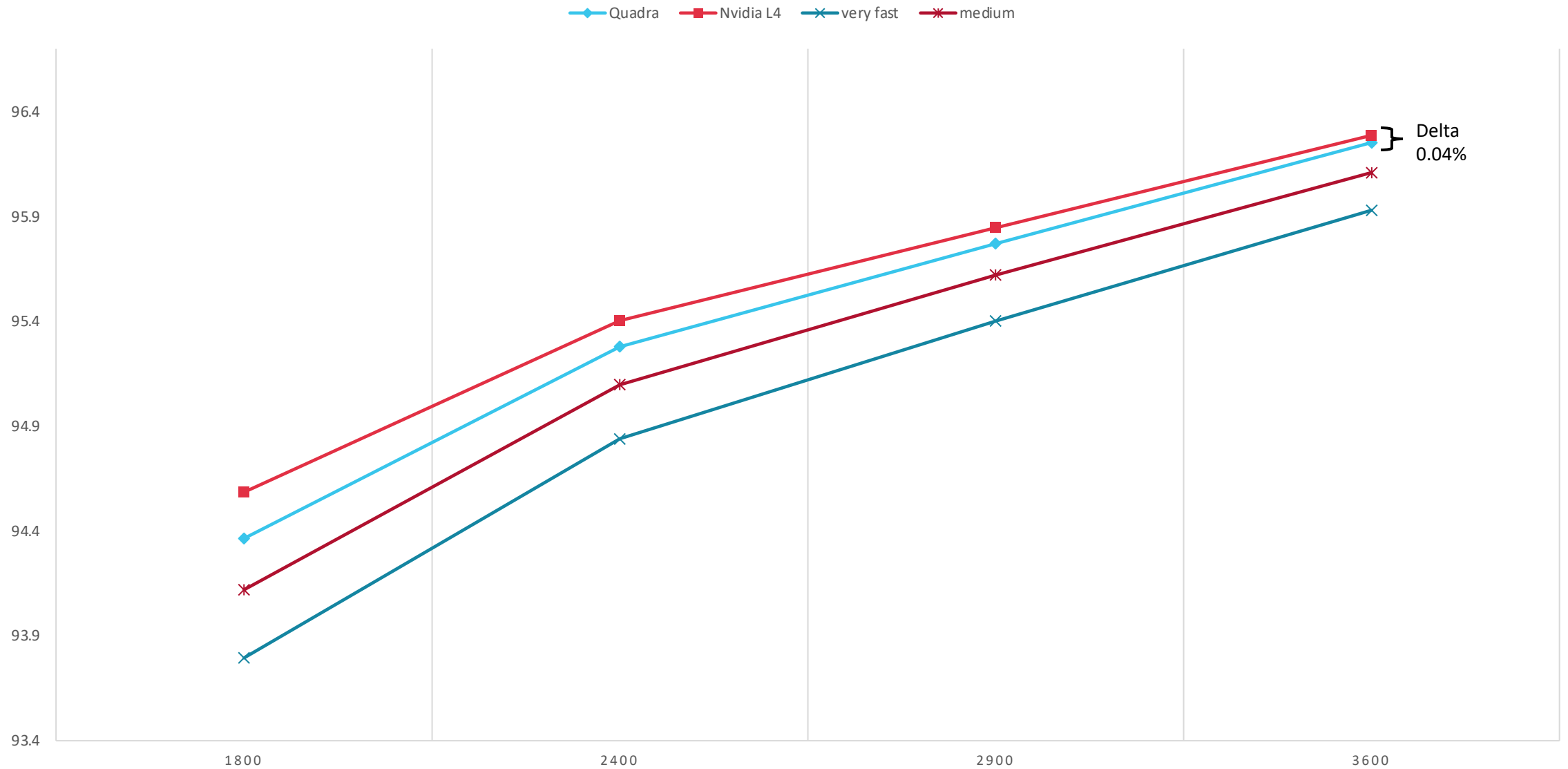
Low Frame – H.264



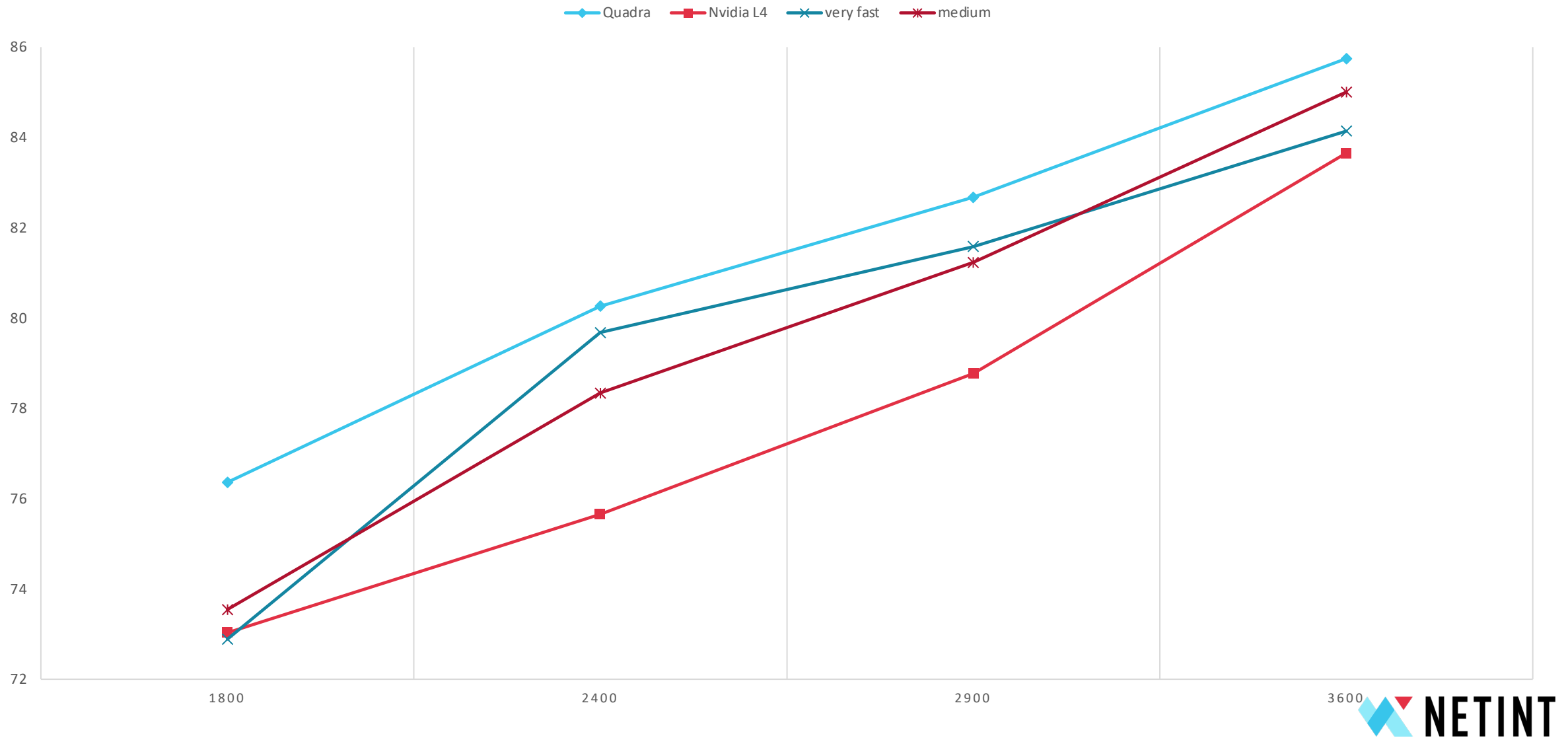
VMAF Across all Frames – H.264



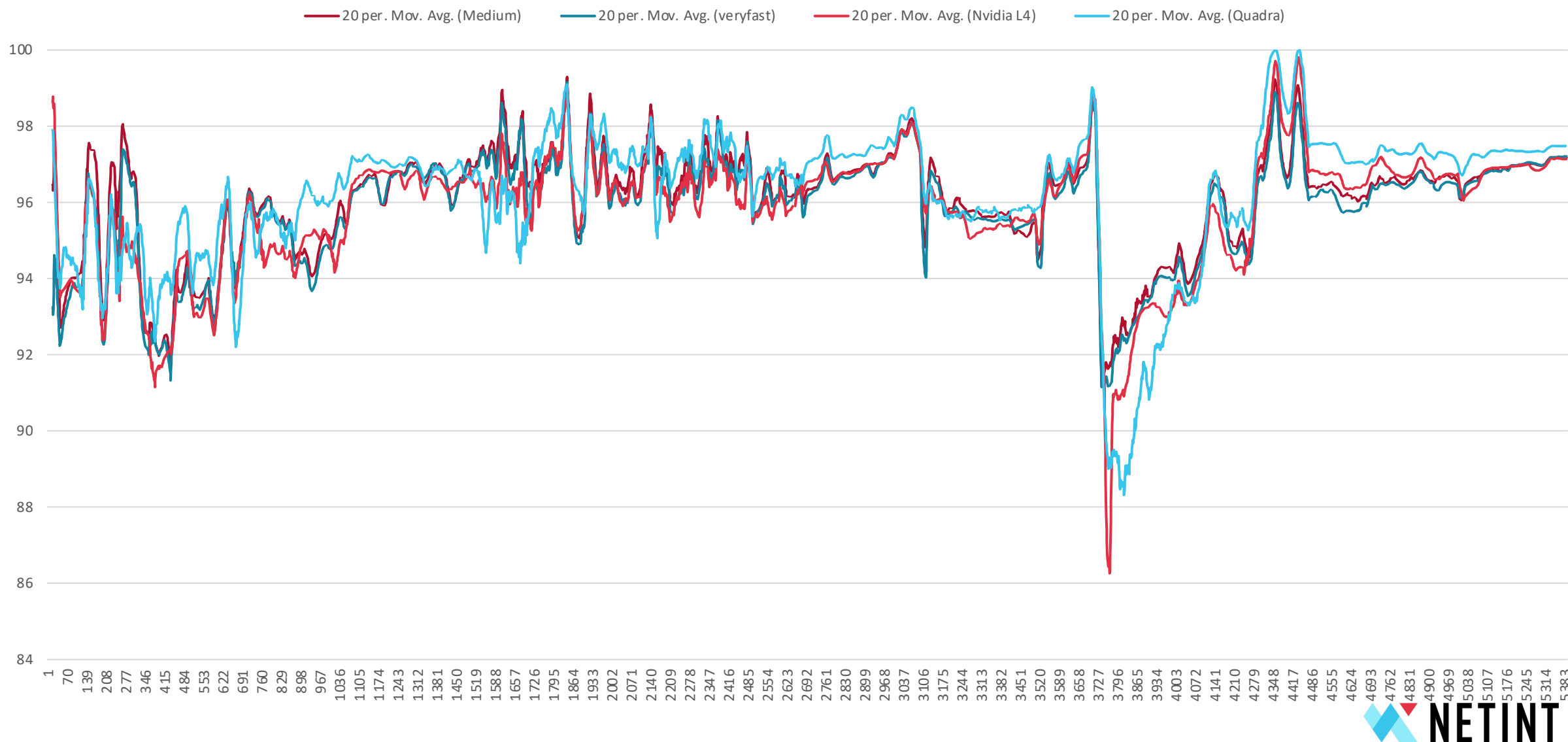
Quality – HEVC



Low Frame – HEVC



VMAF Across all Frames - HEVC



Options that Impact Quality

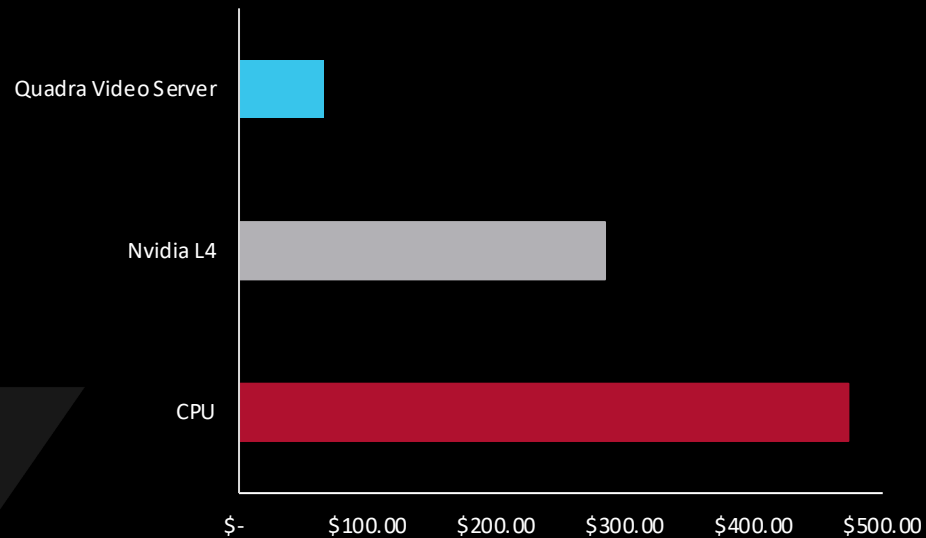
- Rate Distortion Optimization
 - H.264 - 1/0
 - HEVC - 1/2/3
- Lookahead
- Bitrate

Analysis

- Server Capacity
- Power Consumption
- 320 Channel Example
- Cost/Power Analysis
- Output streams are 1080p30

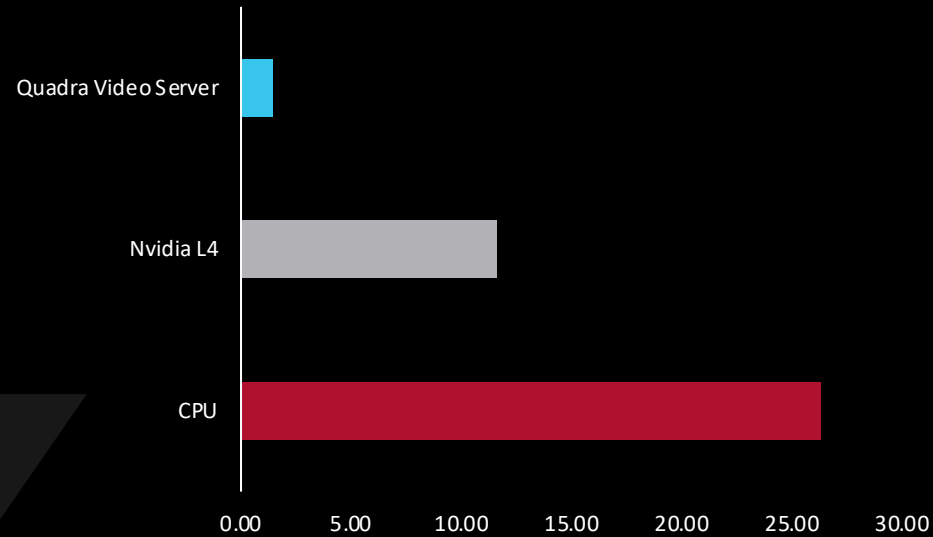
Server Capacity – H.264

	Cost	AIC	Capacity	Cost per Stream
CPU	\$7,100	-	15	\$473
Nvidia L4	\$14,214	2	50	\$285
Quadra Video Server	\$21,000	10	320	\$65



Power Consumption – H.264

	Total Watt	AIC	Capacity	Watts per Stream
CPU	394	-	15	27.3
Nvidia L4	580	2	50	11.6
Quadra Video Server	450	10	320	1.4



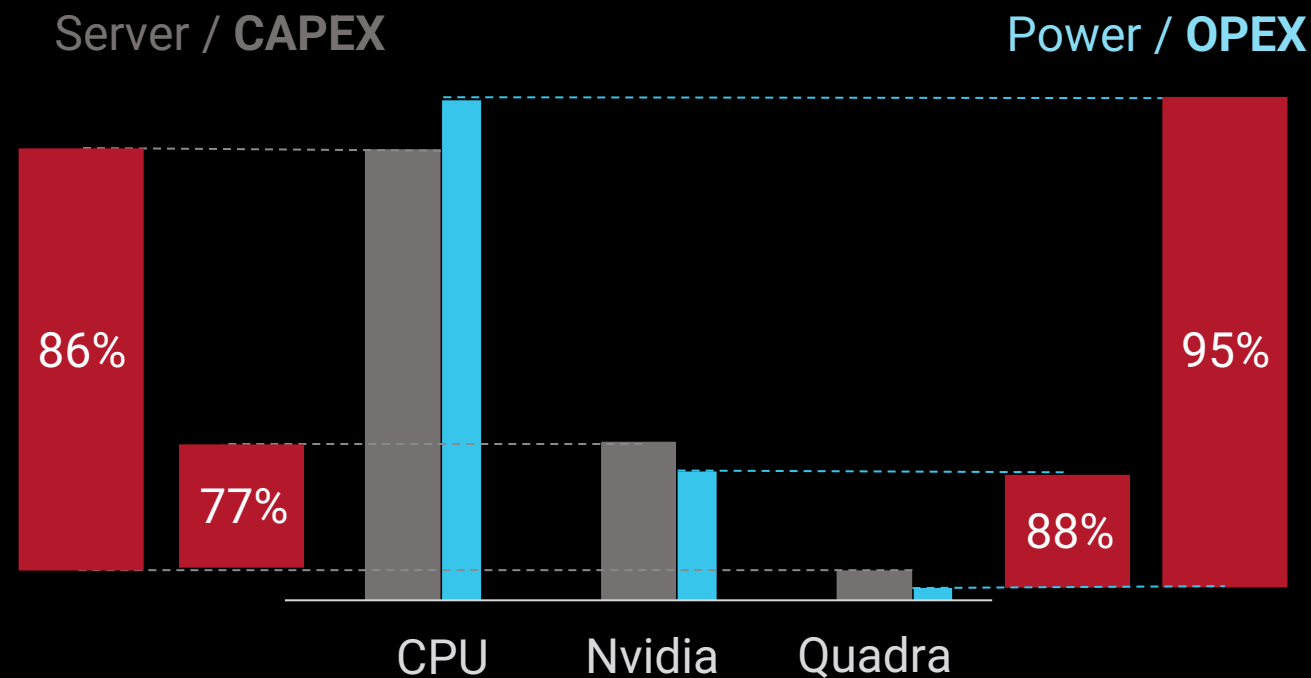
Server Cost: (320 Channel) – H.264

	No. Servers	Cost per Server	Total Cost
CPU	21	\$7,100	\$151,467
Nvidia L4	6	\$14,214	\$90,969
Quadra Video Server	1	\$21,000	\$21,000

Power Consumption: (320 Channel) – H.264

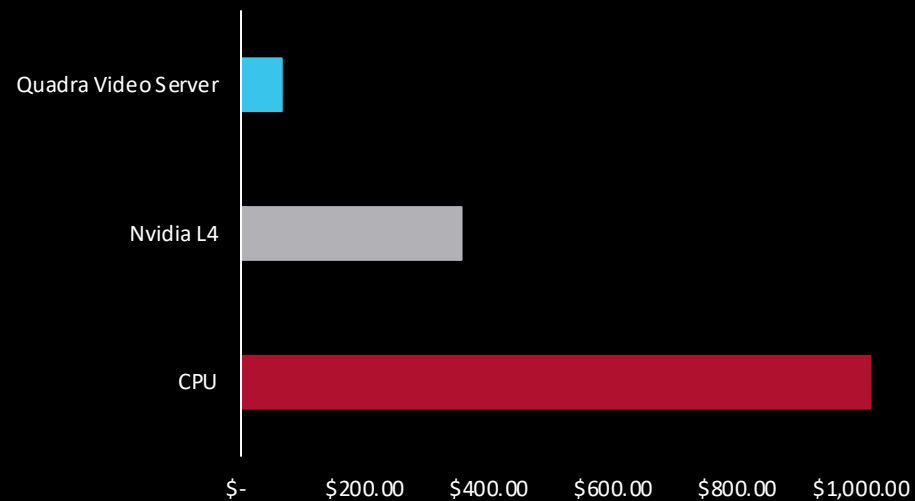
	No. Servers	Watts per Server	Total Wattage
CPU	21	394	8,274
Nvidia L4	6	580	3,480
Quadra Video Server	1	450	450

Real savings of VPU's (H.264)



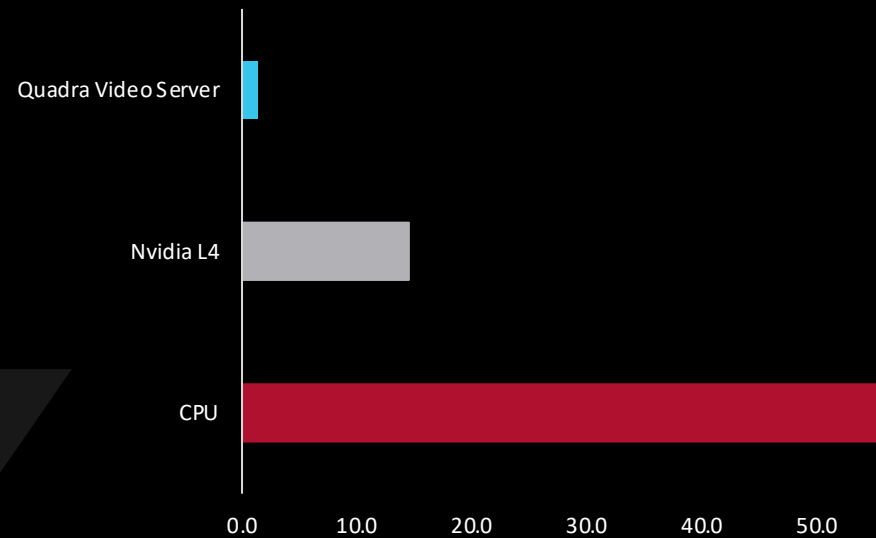
Server Capacity - HEVC

	Cost	AIC	Capacity	Cost per Stream
CPU	\$7,100	-	7	\$1014
Nvidia L4	\$14,214	2	40	\$355
Quadra Video Server	\$21,000	10	320	\$65



Power Consumption - HEVC

	Total Watt	AIC	Capacity	Watts per Stream
CPU	394	-	7	56.2
Nvidia L4	580	2	40	14.5
Quadra Video Server	450	10	320	1.4



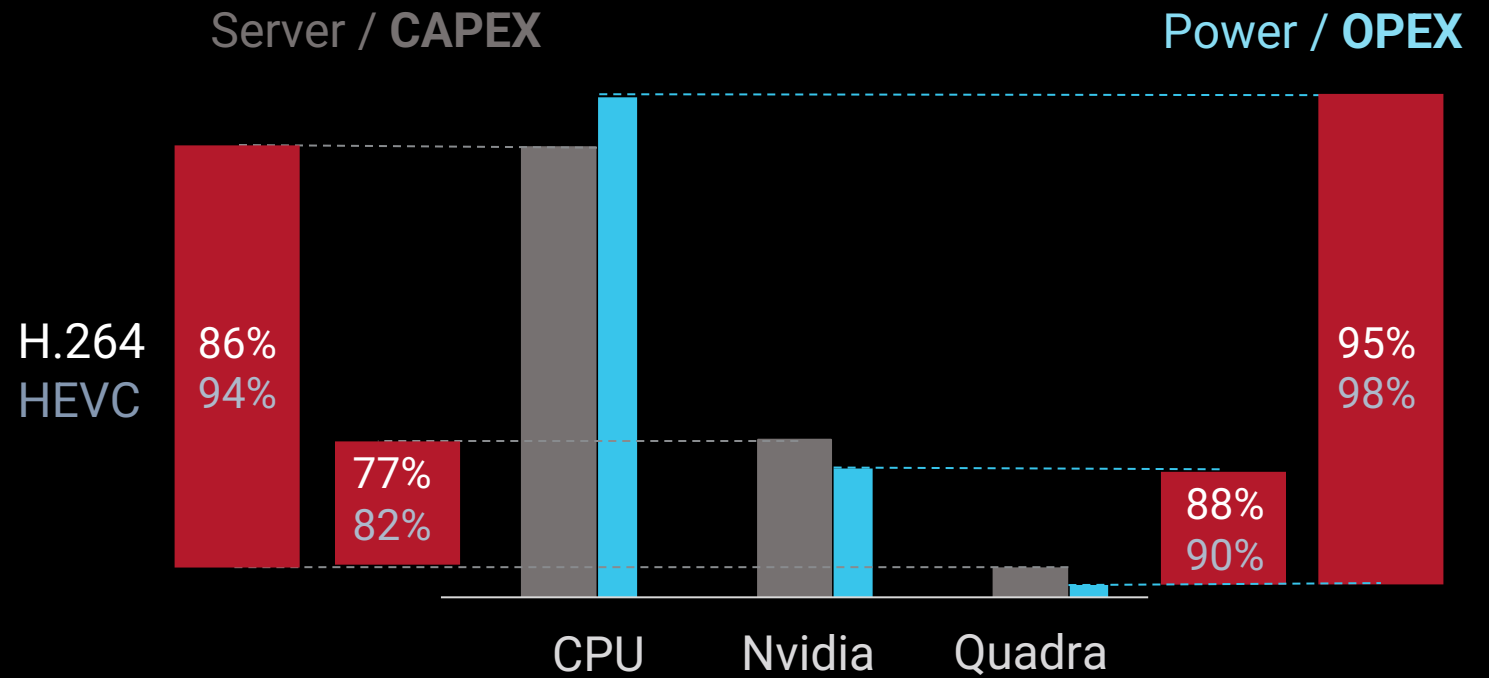
Server Cost: (320 Channel) - HEVC

	No. Servers	Cost per Server	Total Cost
CPU	46	\$7,100	\$324,571
Nvidia L4	8	\$14,214	\$113,712
Quadra Video Server	1	\$21,000	\$21,000

Power Consumption: (320 Channel) - HEVC

	No. Servers	Watts per Server	Total Wattage
CPU	46	394	18,124
Nvidia L4	8	580	4,640
Quadra Video Server	1	450	450

Real savings of VPU



A grayscale photograph of a server room. Several tall server racks are visible, filled with electronic equipment. The room has a tiled floor and a grid ceiling with recessed lighting. The image is used as a background for the left portion of the slide.

Question:

**What about
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**Full 1:1 Hardware redundancy and with
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Full 1:1 Hardware redundancy and with geo-redundancy

- VPU's will require four (4) servers
- Total Cost of \$84,000
- LESS than a non-redundant GPU or CPU system

Thank you



NETINT

HYPERSCALE PROFITABLY

Logan Video Server

Quadra Video Server

Hardware Details

Servers

Logan

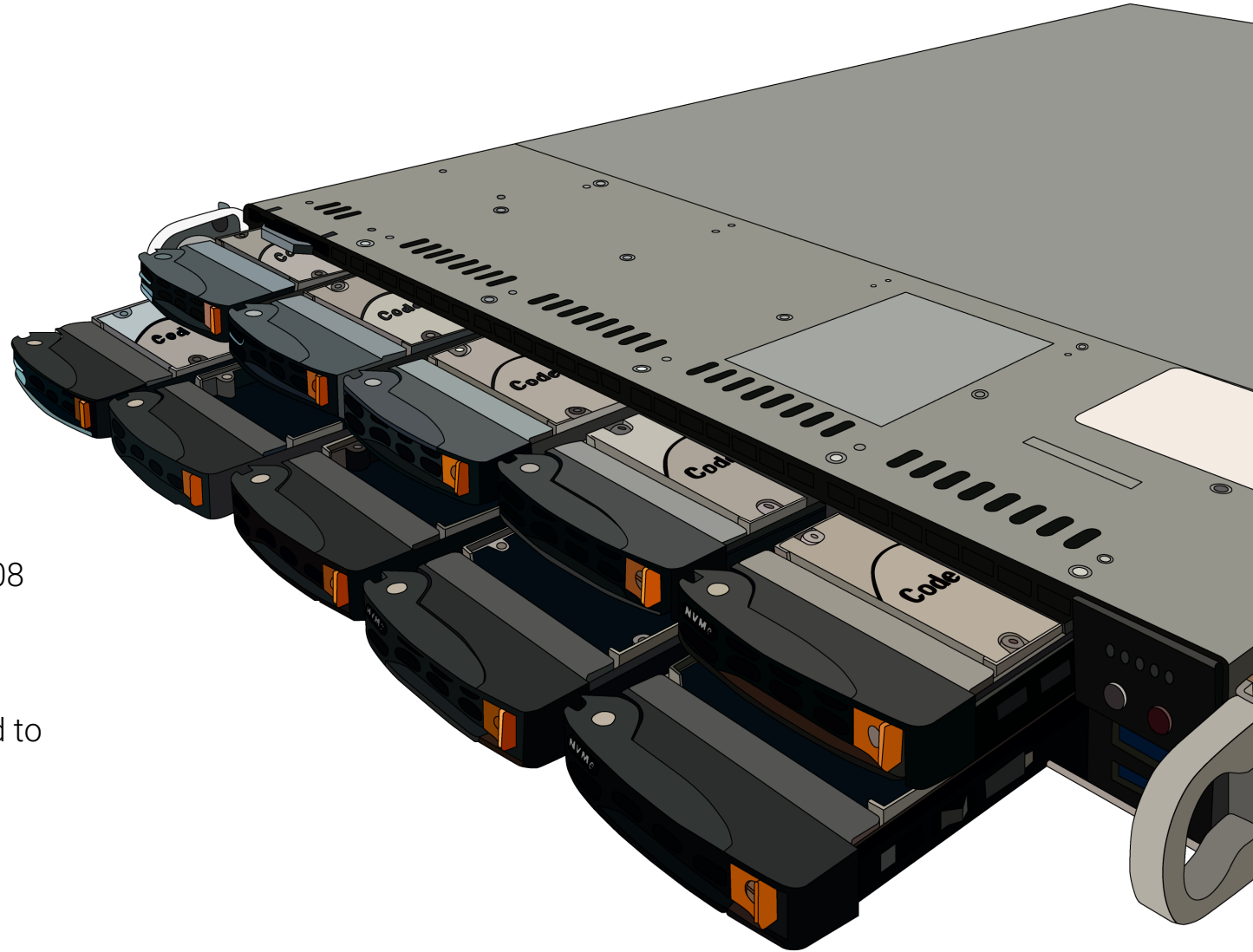
Transcoding Video Server

- High-density live UHD transcoding
- Ten T408 video transcoders
- Highest power efficiency, lowest watt draw @ 7W per T408
- Supermicro 1114S-WN10RT server platform
- Ultra-low latency encoding
- Up to 80 broadcast quality 1080p30 streams
- Up to 80% reduction in OPEX and CAPEX costs compared to software-based encoding systems.



Supports:

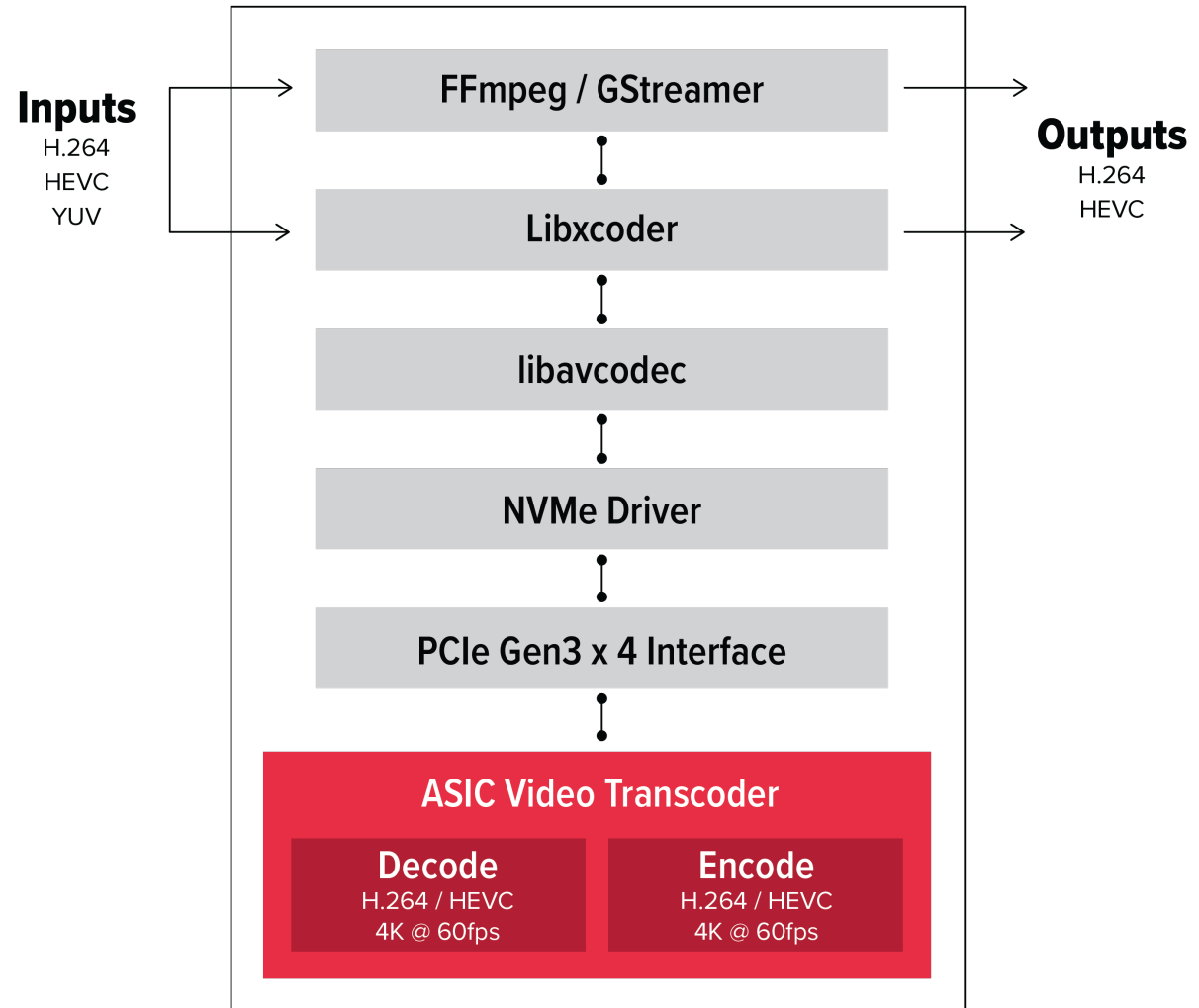
- HEVC and H.264 video encoding
- Up to 4K resolution
- 10-bit HDR
- Enterprise NVMe integration



Servers

Logan

Transcoding Video Server



Servers

Quadra

VPU Video Server

- High-density live UHD transcoding capacity up to 90-95% less in OPEX & CAPEX costs compared to software encoding
- Ultra-low latency encoding
- Ten Quadra T1U video processing units
- AI-based, 2 Deep Neural Network engines with 18 trillion operations per second (TOPS)
- High power efficiency, low watt draw @ 20W per T1U
- Up to 320 broadcast quality 1080p30 streams
- Supermicro 1114S-WN10RT server platform



Supports:

- HEVC, H.264, AV1 and VP9 video encoding/decoding
- Up to 8K resolution
- 10-bit HDR
- Enterprise NVMe integration



Servers Quadra

VPU Video Server



Inputs

H.264
HEVC
VP9
YUV

