

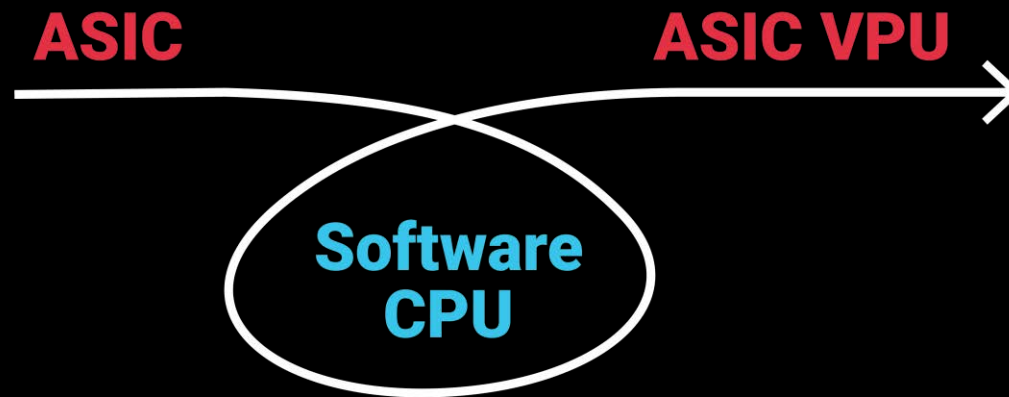
# Video Transcoding



**A Technological Odyssey**  
from ASICs to Software and back, to VPUs

# Here's what we will cover

- What is an ASIC
- The transcoding timeline
- What the future holds



# What is an ASIC?

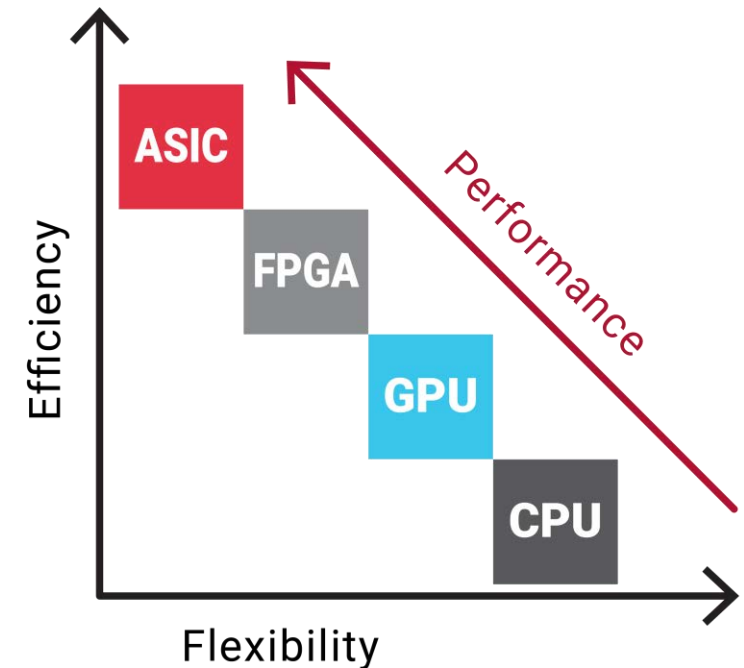
## Application-Specific Integrated Circuit (ASIC)

Purpose-built for specific functions

- Encoding, transcoding and processing video

Advantages over other hardware alternatives

- Smaller and less expensive
- Superior performance – FAST!
- Lowest power consumption



# ASICs – Original Usage for Transcoding

ASIC-based compression powered the shift from analog to digital TV

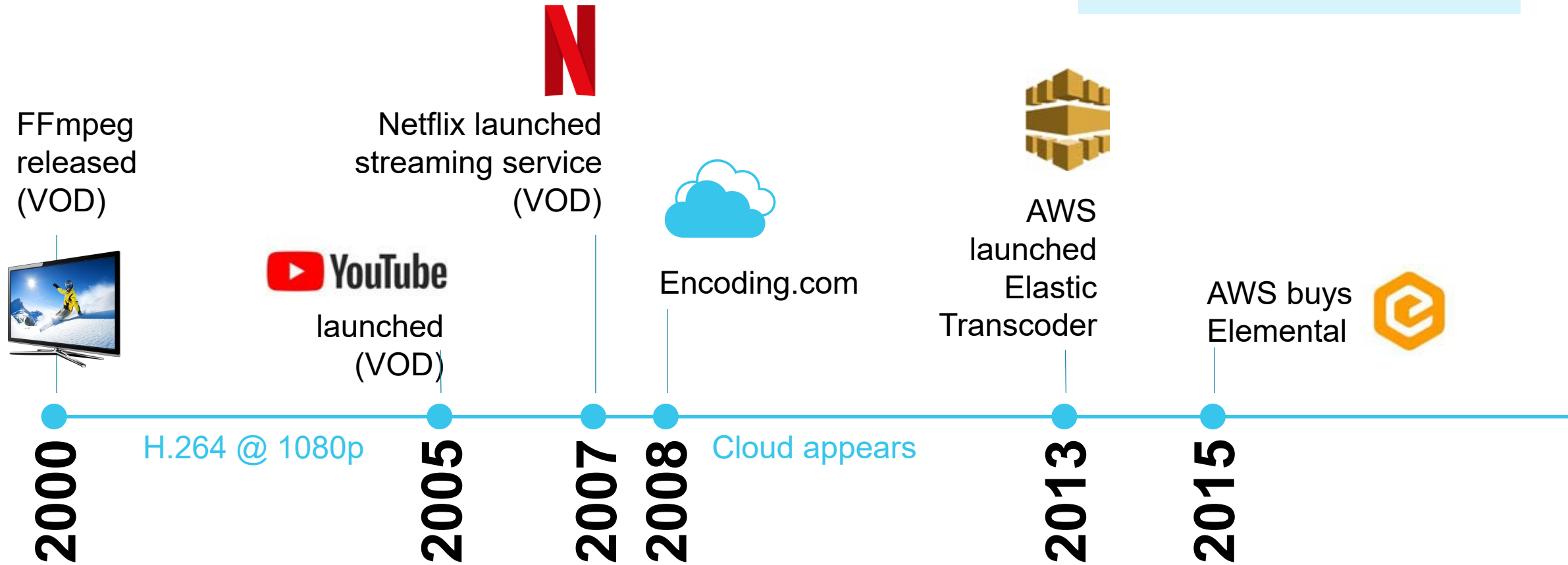
- General purpose CPUs were underpowered for live operation
- ASICs were the most practical solution

2000



# History of CPU Transcoding

Streaming industry in fast-growth phase:  
Speed over profitability



# ASIC

# Reenter the Market

Sole Purpose of Transcoding

# ASIC Timeline



NETINT was founded to develop next-gen SoC solutions

2015



Alex Liu and Tao Zhong foresaw the need for ASIC-based transcoding

2017

T408 launched: the industry's first commercially available, ASIC-based transcoder

- H.264/HEVC input
- H.264/HEVC output

2018



Launched Quadra Smart VPU, *boosted with AI and AV1 output*

- 8K60 per chip
- H.264/HEVC/VP9 in
- H.264/HEVC/AV1 out
- Onboard scaling & overlay
- 15-18 TOPS AI engine

2021

# Major Market Shifts

Live Streaming  
Skyrockets

- Entertainment
- Sports
- Conference

High-Volume  
Stream Services  
Released

- Cloud Gaming
- Surveillance

HEVC/AV1  
adapted up  
to 8K/HDR

**Streaming industry  
matures:**

- Profitability is critical
- Power usage concern
- Net Zero 2030

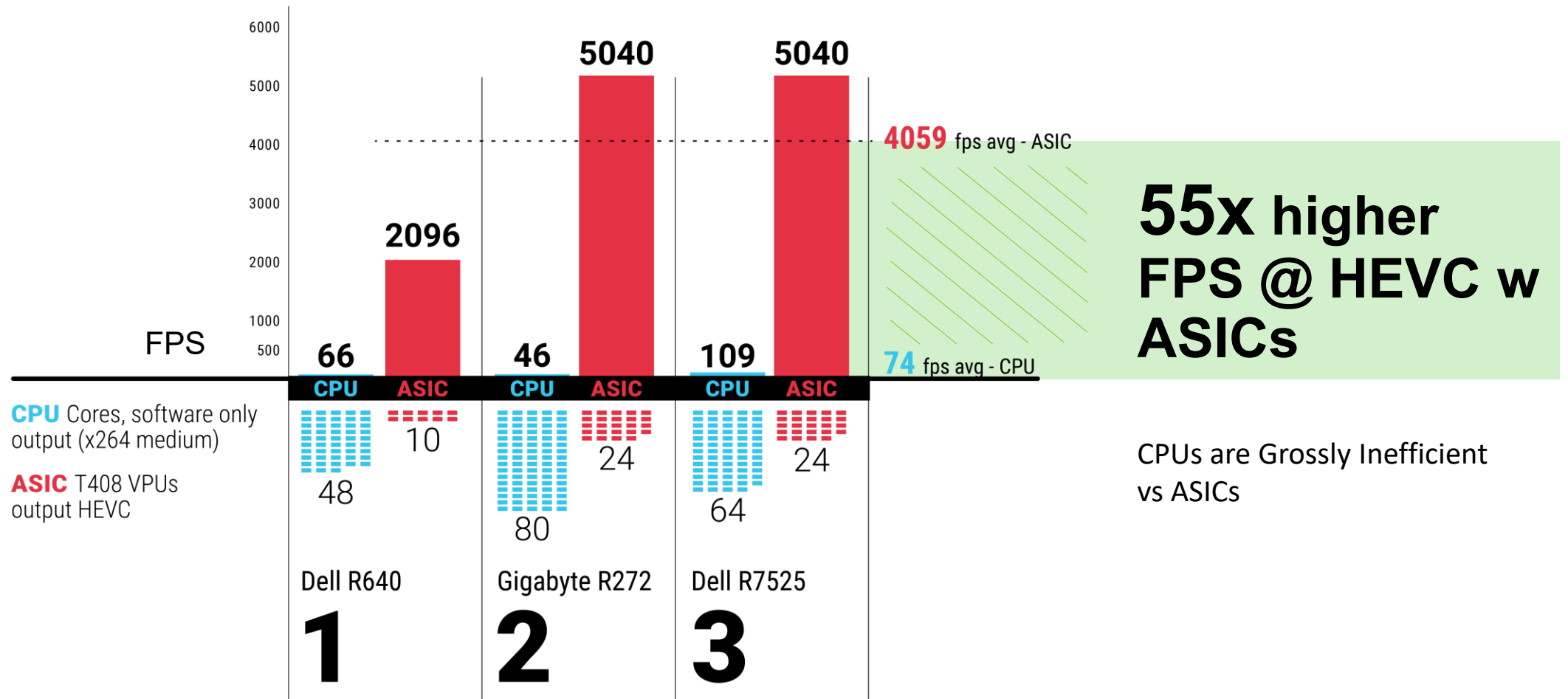
2015

2023



# FPS at HEVC output

Frames per second



# Advanced ASICs Power Smart VPU



## What makes it smart?

- 15 -18 TOPS, AI processing
- Onboard scaling & overlay
- Universal OS & Kernel compatible
- Virtualization and containerization
- NVMe option: inexpensive, low-power, highly scalable integration
- Runs on x86 and ARM servers for Linux, Windows, Mac, or Android

# First to Market; Still Ahead

			
1st Gen ASIC	<b>2018</b>	<b>2019</b>	<b>2021</b>
2nd Gen ASIC	<b>2021</b>	<b>2022</b>	-
ASIC with AV1	<b>2021</b>	-	-
ASIC with AI	<b>2021</b>	-	-

**Why yes, those are  
all industry firsts!**



# ASIC win for Mayflower

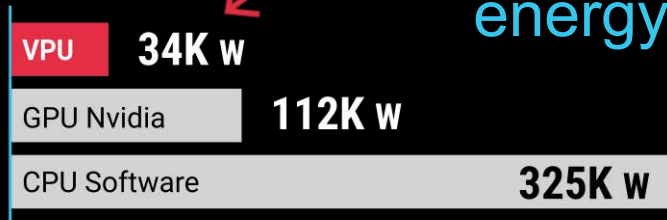
- 10,000 inputs
- 1 million outputs

\$8.6 Mil saved in 1 year converting to ASIC VPUs

## TOTAL CAPEX Million

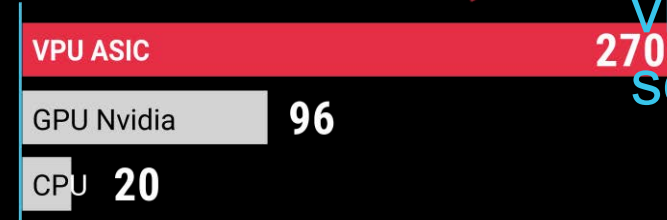


## Total Power Consumption Watts



-90% less energy used

## Server Density Streams



1,250% more streams to more viewers per session

# ASIC win for api.video

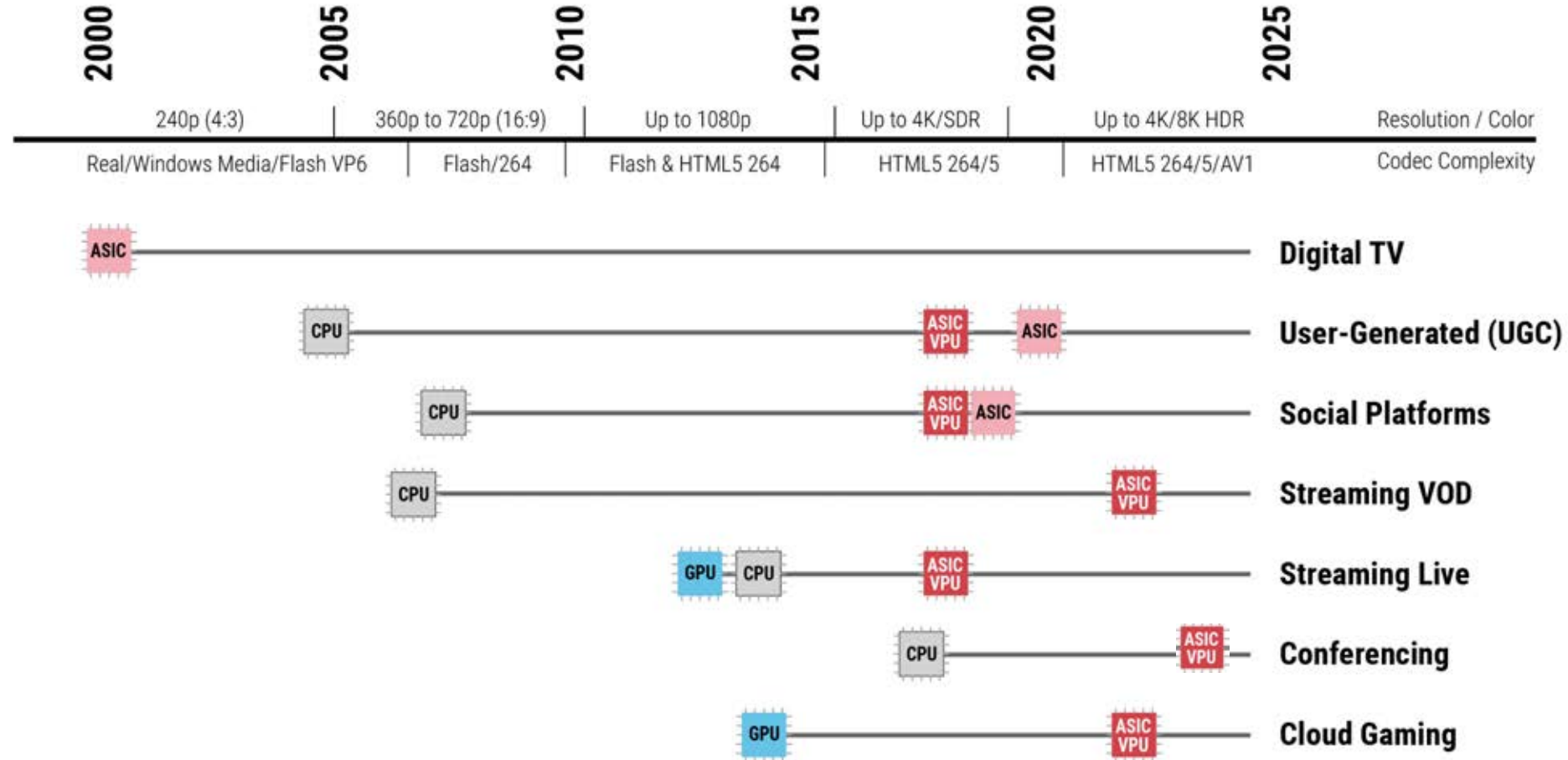
api.video is a live and VOD service provider



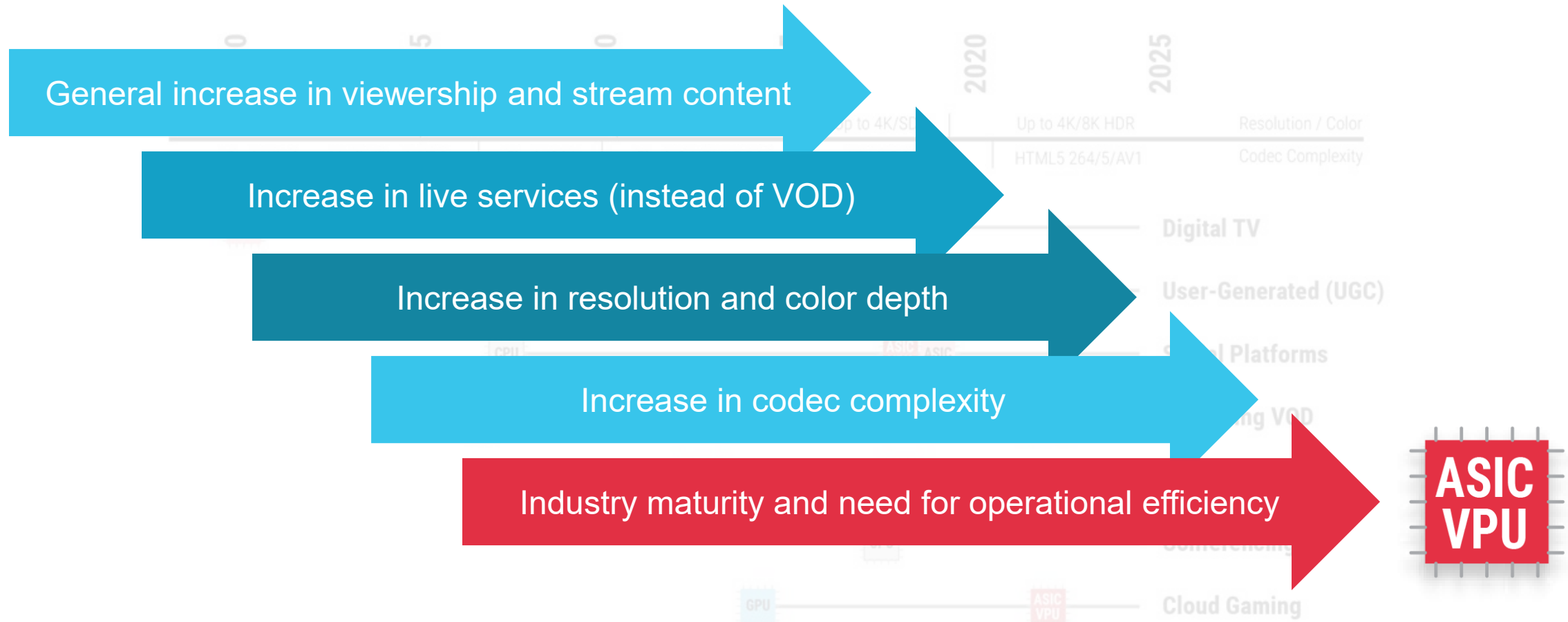
Resulting in  
their offer for  
**FREE**  
transcoding to  
its customers

Dropped transcode  
cost to **\$0.0002 /minute**  
at 50% utilization

# Relevant Transcoding Markets



# What's Driving ASIC VPU Adoption?



# The Bottom Line

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## Transcode with ASICs

NETINT has delivered over 100,000 VPU's in two ASIC generations into multiple markets, ensuring a:

- Robust, reliable solution
- Mature, highly usable software interfaces
- Extensive and mature feature sets for multiple markets

- Service providers
- Operators of live streaming
- Social media
- UGC
- Interactive streaming
- Cloud Gaming
- Surveillance & Security
- Conferencing
- And more...



# Looking Ahead

## Goals for Next Generation

**Newer  
codecs**

**Higher  
quality and  
more  
features**

**Hybrid  
encoding**

**Stronger eco-  
system**

**AI and  
Generative  
AI  
enhanceme  
nt**

Thank you

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