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# Adaptive Bitrate Transcoding on Alveo™ Accelerator Cards

OVERVIEW

The demand for live video streaming has become a critical business need. Video service providers are faced with balancing high-quality experiences for their customers, while managing their infrastructure and operating costs. Given the computational intensity of converting video, transcoding has prompted the need for adaptable hardware acceleration.

Xilinx has assembled a high-performance video transcoding package that delivers the power and performance service providers need without altering existing infrastructure.

In addition, the solution utilizes the very powerful industry proven FFmpeg command-line based processing from which anyone can develop a transcoding application or easily bolt into an existing application or their own infrastructure.

PRODUCT OVERVIEW

> Highest quality live encoding for low bitrate or high density applications

> Accelerated encoding with minimal host CPU requirements

> HEVC and H.264 encoding streams with ABR Ladder on a Alveo U50 and U30 accelerator cards
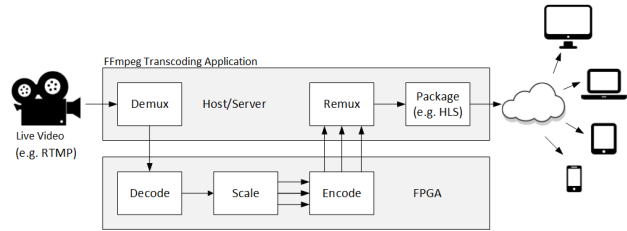
> Simple API based on FFmpeg industry standard
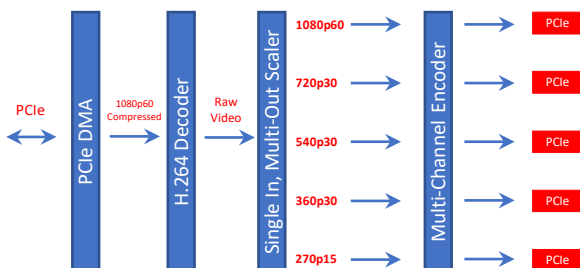
XILINX ADVANTAGE

> Quick evaluation on Xilinx Alveo™ data center accelerator cards

> Low Bitrate HEVC / H.265, H.264 & VP9 encoders and decoders on Alveo U50

> 8 x 1080p60 High Density HEVC / H.265, H.264 encoders and decoders on Alveo U30

> Easy development with FFmpeg command-line processing

> Fully configured transcoding pipeline with ABR ladder

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Adaptable. Intelligent.

INTELLIGENT PARTIONING

Xilinx provides the highest performance at the system level. By offloading the encoding from the CPU ensures the CPU can support other critical functions like audio and ad insertion.
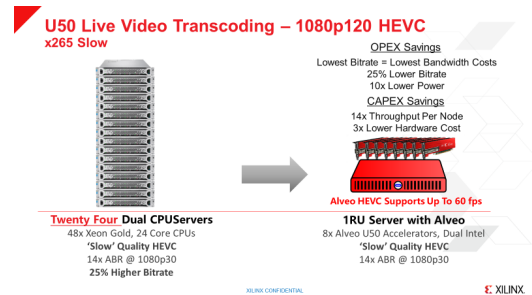
FFmpeg API support enables customers to integrate up to eight Alveo HHHL U50 or U30 accelerator cards and software into their 1 RU server with ease.
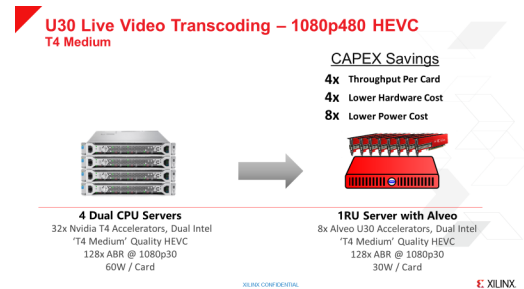

FFmpeg Transcoding Application

Live Video (e.g. RTMP) → Demux → Host/Server → Remux → Package (e.g. HLS)

Decode → Scale → Encode — FPGA

FEATURES

> Real-time encoding at visual quality up to x265 'slow' preset levels

> Lowest bitrate encoding for broadcasts with a large number of viewers on U50

> Low bitrate = lowest internet bandwidth costs

> High Density encoding when many encoders are needed such as User Generated Content (UGC)

> 10x lower power consumption than CPU

> 2x lower power than GPU

> Full ABR Ladder Support with advanced scaler

> Flexible multiple ABR Ladder outputs with up to 32 streams with a single instance

> Consistent output quality, independent of number of encoding channels

> FFmpeg plugins for decoder, scaler, and encoders

> HEVC: Main 10 profile up to Level 5.1 HD/SD 4:2:0 8 bit on U50, 4:2:2 10bit on U30.

> H.264: Main 10 profile up to Level 5.1 HD/SD 4:2:0 8 bit on U50, 4:2:0 10bit on U30.

> Constant bitrate (CBR), capped VBR, and ABR modes

> Bitrates: Configurable from 100 Kb/s to 40 Mb/s

> Latency: Configurable from 30ms to 20s

> Slice types: I, P, and B with flexible open/closed GOP modes and GOP lengths

Xilinx Real-Time Video Server
Bitrate Optimized Edition

U50 Live Video Transcoding – 1080p120 HEVC
x265 Slow

OPEX Savings
Lowest Bitrate = Lowest Bandwidth Costs
25% Lower Bitrate
10x Lower Power

CAPEX Savings
14x Throughput Per Node
3x Lower Hardware Cost

Alveo HEVC Supports Up To 60 fps

Twenty Four Dual CPUServers
48x Xeon Gold, 24 Core CPUs
'Slow' Quality HEVC
14x ABR @ 1080p30
25% Higher Bitrate

1RU Server with Alveo
8x Alveo U50 Accelerators, Dual Intel
'Slow' Quality HEVC
14x ABR @ 1080p30

Xilinx Real-Time Video Server
High Channel Density Edition

U30 Live Video Transcoding – 1080p480 HEVC
T4 Medium

CAPEX Savings
4x Throughput Per Card
4x Lower Hardware Cost
8x Lower Power Cost

4 Dual CPU Servers
32x Nvidia T4 Accelerators, Dual Intel
'T4 Medium' Quality HEVC
128x ABR @ 1080p30
60W / Card

1RU Server with Alveo
8x Alveo U30 Accelerators, Dual Intel
'T4 Medium' Quality HEVC
128x ABR @ 1080p30
30W / Card

TAKE THE NEXT STEP

Learn more about Xilinx Real-Time Video Server Appliance
Contact Sales: RTVideoServer@Xilinx.com