Hewlett Packard Enterprise

Product brief

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REAL-TIME LOW-BITRATE HIGH-QUALITY ABR VIDEO TRANSCODING

Leverage HPE and Xilinx technologies

Lower hardware cost and bitrate efficiency provides significant CAPEX and OPEX savings.

Solution components

- HPE ProLiant DL385 Gen10 Plus server
- Xilinx Alveo U50 accelerator cards
- Xilinx video transcoding firmware and license

Product overview

- Low-bitrate high-quality live encoding for the lowest internet bandwidth cost (OPEX)
  - AMD Second generation EPYC processor technology
- Accelerated encoding with minimal host CPU loading for video encode function
  - High-performance HEVC and H.264 encoding streams with ABR ladder support
- Fully configured transcoding pipeline solution
  - Simple API based on industry standard FFmpeg

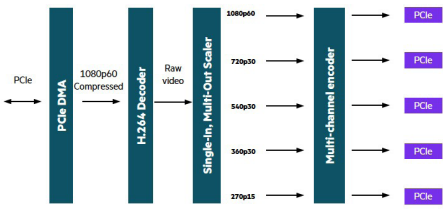

FIGURE 2. Transcoding ABR ladder

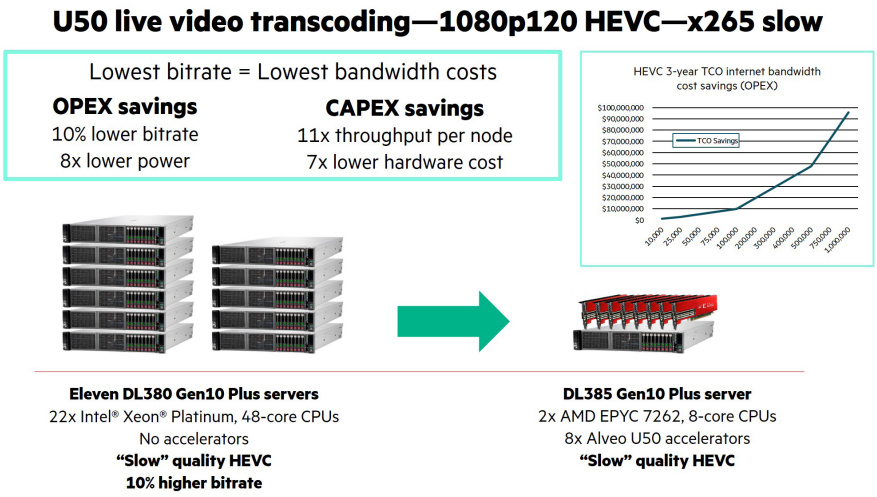

FIGURE 1. HEVC TCO example

INTRODUCTION

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

Today, video service providers manage bandwidth while guaranteeing high-quality video distribution by utilizing next-generation compression standards and adaptive bitrate (ABR) streaming protocols. Both approaches reduce bitrates but increase computational complexity.

Xilinx and Hewlett Packard Enterprise (HPE) have built an end-user solution that provides revolutionary performance using HPE ProLiant DL385 Gen10 Plus servers, with second-generation AMD EPYC processors.

A server configured with seven U50s for encoding and one U50 for H.264 decoding and scaling can support the video streams resolutions and full ABR ladders shown as shown in Table 1:

TABLE 1. Stream and ABR ladder examples

Resolution	HEVC video streams	H.264 video streams
1080p60	14	14
720p60	28	28
1080p50	14	14
720p50	28	28
ABR ladder p60	7	7
ABR ladder p50	7	7

INTELLIGENT PARTITIONING

Xilinx and HPE provide the highest system-level performance. Detailed workload profiling ensures intelligent functional partitioning between the host CPUs and the Alveo accelerator cards. Offloading the encoder function from CPUs ensures the processor can support other critical tasks like audio processing and ad insertion. FFmpeg plug-in support enables customers to easily integrate the Alveo U50 accelerator card and software into existing infrastructure. A standard command line window provides full control.

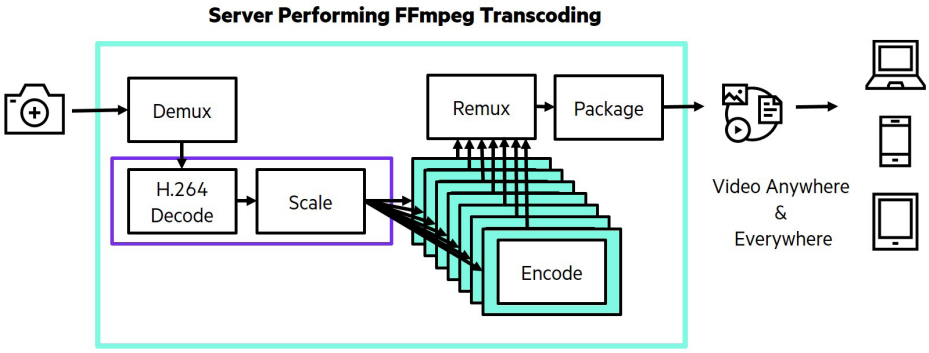

FIGURE 3. Transcoding data flow from content generator to consumer

BENEFITS AND FEATURES

- 1080p60 real-time encoding with x265 slow visual quality
- Higher throughput per node
- Lower bitrate encoding reduces network bandwidth cost
- Lower hardware cost
- Lower power consumption than CPU-based encoding
- FFmpeg plug-ins for decoder, scaler, and encoders
- Deterministic performance unlike software encoders
- HEVC: Main 10 profiles up to Level 5.1 HD/SD 4:2:0 8-bit
- H.264: Main 10 profiles up to Level 5.1 HD/SD 4:2:0 8-bit
- Bitrates: Configurable from 100 Kb/s to 40 Mb/s
- Latency: Configurable from 100 ms to 10 sec
- Constant bitrate, capped variable bitrate (VBR), and ABR modes
- Frame types: I, P, and B with flexible open/closed GOP modes and GOP lengths
- Cost-effective HPE servers to provide lower TCO than software-based solutions
- Minimal server loading on the CPU enables additional functions like audio processing and ad insertion
- HPE iLO BMC support for Alveo U50 cards

BRING YOUR OWN ENCODER IP

Customers who deploy proprietary video encoder IP written in C++ or RTL can potentially leverage accelerated offload using Alveo's Vitis tool-chain. Please contact your local HPE or Xilinx sales representative for details.

TAKE THE NEXT STEP

For complete information on HPE servers, visit hpe.com/in/en/servers.html.

To learn more about this solution, review the HPE Live Video Transcoding Reference Architecture.

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