AMD Powers DeePoly GIF2WebP Animated Graphic Solution

AMD Alveo™ U200 Accelerator Card Helps DeePoly's ThunderImage Transcoding Solution Deliver Innovative Multimedia Presentation Experiences

AT A GLANCE:

Founded in 2016, DeePoly Tech provides data centers with high-performance image and video processing solutions and products based on FPGA + CPU heterogeneous computing technologies.

In 2021, the company introduced its ThunderImage GIF2WebP animated graphic transcoding solution on the Aliyun Market. Powered by AMD technology, it is the first FPGA-based SaaS animated graphic transcoding product launched in China.

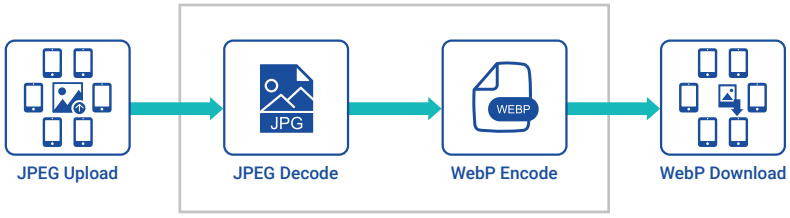

Figure 1. Transcoding process using DeePoly's ThunderImage GIF2WebP solution

Industry: Data Center
Head Office: Beijing, China
Established: 2016
Website: http://www.deepoly.com

SUMMARY:

The explosive growth of mobile internet has driven content service providers to use large quantities of animated graphics. Though GIF remains the most-prominent animated graphic format for the web, it can be impeded by such issues as heavy network traffic and compute-intensive decoding, sometimes resulting in a poor user experience or even content unavailability. WebP animated graphic processing presents an excellent alternative to GIF, however its highly complex computation brings excessive transcoding latencies that are unfeasible in practice.

To solve the issue of excessive latency in WebP animated graphic transcoding, DeePoly chose AMD's Alveo U200 accelerator card for its ThunderImage GIF2WebP animated graphic transcoding solution. This acceleration technology allows the ThunderImage solution to deliver an innovative, multimedia presentation experience to content providers.

CHALLENGE:

With the growth of mobile internet, content providers are more-frequently choosing intuitively expressive animated graphics for web pages.

GIF remains the dominant animated graphic format for the web, even though it has been 32 years since the specification was last updated (1989). Since that time, software and hardware environments have undergone many breakthroughs to the point that it has exposed many of the limitations of the GIF file format, which include large file size, limited color palette, and poor decoding efficiency. GIF animated graphics can take up a large amount of network traffic, placing a heavy burden on decoding, and leading to undesirable or even unacceptable user experiences.

To address these issues, a new animated graphic format, called WebP, rose to the challenge. The primary benefit of WebP is a significantly reduced file size that saves network traffic and reduces transmission latency. WebP animated graphics use 50% less storage space than GIF images of the same resolution. And with scaling, WebP images can cut storage requirements by an average of 62% versus GIF. Furthermore, due to its powerful compression and color palette, WebP is also able to produce animations with higher definition image quality, compared to GIF.

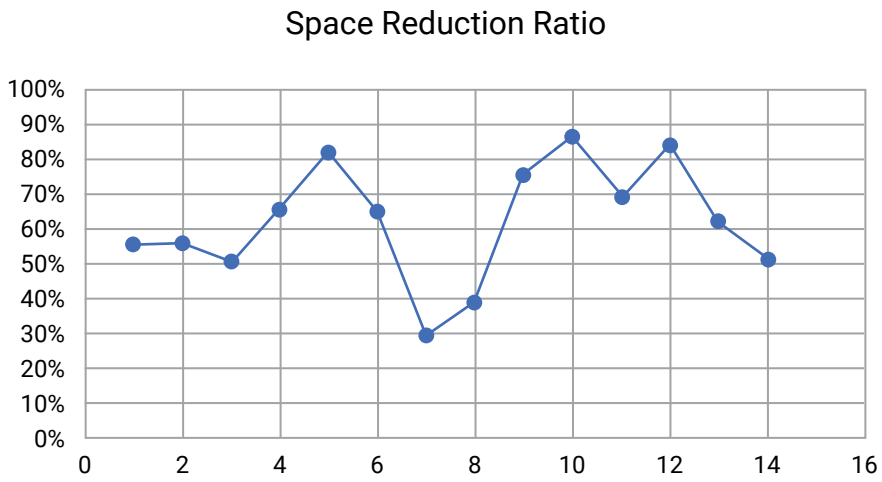

Image 1: This small-scale data sample indicates WebP images with the same resolution save 62% space on average vs. GIF

Despite solving file size and image quality issues, the WebP animated graphics still had a latency issue to deal with. That's because coding WebP animated graphics required the equivalent of processing tens to hundreds of WebP still images, resulting in very high computational complexity. Even using the fastest open-source algorithms and running a CPU, the transcoding operation had a latency exceeding ten seconds, resulting in a poor user experience.

SOLUTION:

To solve the issue of excessive transcoding latency, DeePoly chose AMD's Alveo U200 accelerator card for its ThunderImage GIF2WebP solution. The Alveo U200 provides performance that cannot be achieved by current CPUs for critical data center workloads, including machine learning inference, video transcoding, and database search and analysis. With this platform, DeepPoly effectively overcame the issues of latency, traffic, storage, and computing.

Solution-ThunderImage Gif2WebP

Solve latency, traffic, storage, and calculation problems once and for all

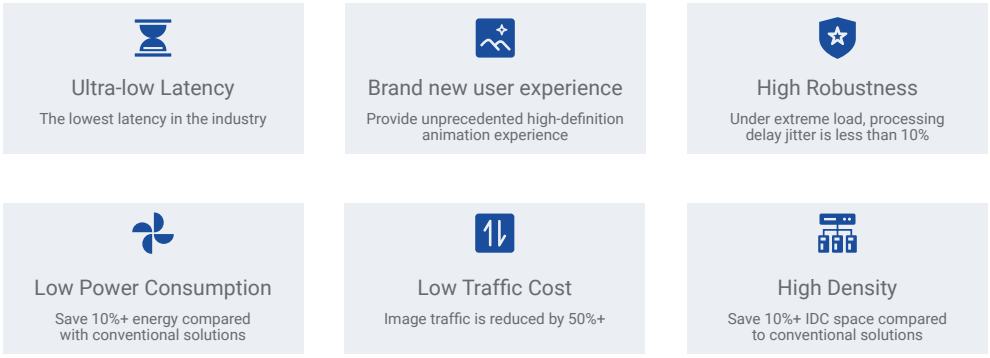

Image 2: ThunderImage GIF2WebP solution

"The AMD high-performance, heterogeneous processing platform enables our ThunderImage GIF2WebP solution to achieve the advantages of high quality and small size for WebP animated images and it brings a new experience of multimedia displays to broad internet content service providers," said Fan Ping, CEO of DeePoly.

Specifically, the ThunderImage GIF2WebP animated graphic transcoding solutions provides:

1. **Ultra-low Latency**
   Compared with CPU processing, the ThunderImageGIF2WebP transcoding solution reduces the transcoding processing latency (end-to-end single image processing latency) by an average of 15x. (Note: The test benchmark CPU is Xeon E5-2680v4 dual core and the memory is 256GB DDR4. The test input is 1,000 GIFs and the output is 400x400 WebP animated images. The test data is based on a AMD Alveo U200 accelerator card.)

2. **Robust Image Quality**
   Due to the powerful compression and color palette (24bit vs 8bit) of WebP compared to GIF, ThunderImage GIF2WebP can present much more refined and higher definition image quality compared to GIF.

3. **Ultra-high Robustness**
   When workloads reach processing limitations, the latency of GIF2WebP transcoding fluctuates by no more than 10%. This effectively improves service reliability.

4. **Low Power Consumption**
   The solution fully leverages the power-efficiency benefits provided by AMD's acceleration cards and saves customers more than 10% in energy consumption compared with GIF2WebP running on CPUs.

5. **Traffic Savings**
   Compared to GIF, GIF2WebP can insangtantly cut down network traffic by more than 50% for users.

6. **Small Footprint**
   Customers can save more than 10% in physical board space compared to a GIF2WebP solution running on CPUs.

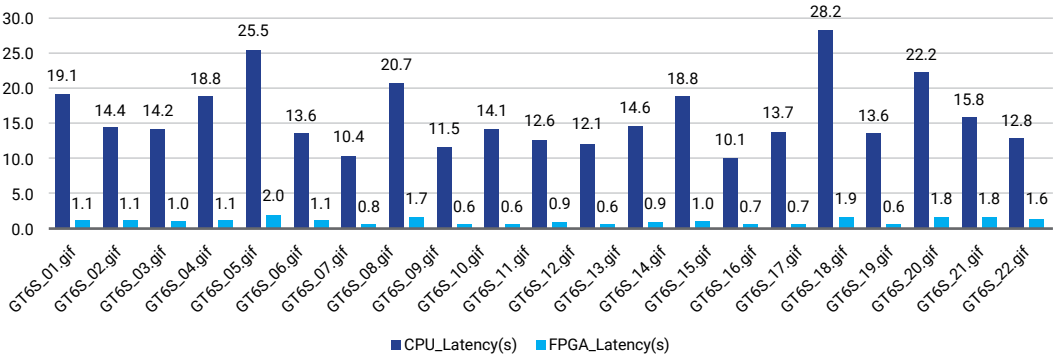

Image 3: The 400x400 latency result achieved in field testing is 15 times lower, on average, compared with CPU

RESULT:

In January 2021, DeePoly's ThunderImage GIF2WebP animated graphic transcoding solution was launched on the Aliyun Marketplace as the first ever SaaS-animated graphic transcoding product based on high-performance FPGA heterogeneous computing in China. The tool is already providing services to the animated poster function of Virtual Cinema, a leading film and television video provider in China.

"Virtual Cinema has many excellent films but failed to garner the interest of users due to the lack of an effective recommendation method in content listing," said by Zhuang Xulin, COO of Virtual Cinema. "With the DeePoly GIF2WebP animated graphics solution, we are able to use high-definition, animated images with plenty of playback time. By presenting recommended films to users in this way, we can help them preview films quickly, significantly increasing the probability that they will watch the listed content."

In addition to film recommendation, the GIF2WebP solution is also expected to be widely used in UGC video, e-commerce, interest communities, animated smartphone screensavers, social media, and other fields.

ADDITIONAL RESOURCES:

Learn More About AMD's Alveo U200

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