PLUM OPTIMIZES AV-OVER-IP DELIVERY USING AMD ADAPTIVE SOCS

Advanced by AMD Zynq™ UltraScale+™ adaptive SoCs, Plum's Dante AV Ultra line delivers cutting-edge performance across global campuses

Plum develops audio-video encoding and decoding solutions that enable businesses and organizations to stream content and broadcast live events. The company's Dante AV Ultra line supports lightly compressed video formats up to 4K60 4:4:4, delivering high video quality with minimal latency. Designed to be compact and durable, the systems are ideal for digital signage, broadcasting, corporate AV, houses of worship, education and more.

In the fast-evolving world of professional AV solutions, Plum faced a critical design challenge: delivering high-performance audio and video processing within tight environmental constraints. Powered by the AMD Zynq™ UltraScale+™ adaptive SoC, the Dante AV Ultra line offers low latency, high-resolution output, and efficient heat dissipation.

CHALLENGE

One of the biggest design challenges that Plum faced was finding a solution that met its thermal requirements. "Heat dissipation is very important when choosing a chipset. We are creating a box, and anything within that small space is governed by very strict building code requirements for thermal output and dissipation," said Yogesh Kanjee, vice president of operations at Plum. "We also needed something that was processor heavy, sips power, and has very low latency, so hardware-based low-latency conversion was very important."

Kanjee explained that its Dante AV Ultra product is designed for extremely compact spaces. "The tolerances are very tight. If our customer is using a camera that's connected to an AV Ultra box, the processing time should be less than one frame, end to end. Synchronous timing is important as is asynchronous clocking on the network. Taking the clock and understanding how to synchronize and being able to do in a millisecond…that's where the AMD Zynq device really excels. Processing efficiency, power, and low latency," said Kanjee.

SOLUTION

Plum's Dante AV Ultra line, powered by AMD FPGAs, includes the Dante AV Ultra Encoder and Decoder – professional-grade devices designed to transmit high-quality audio and video over 1GbE IP networks. The encoder captures HDMI 2.0 video and audio, lightly compresses it with sub-frame latency, and transmits it across the network. It supports HDR10, Dolby Vision, and HDCP 2.2 content protection. The decoder receives the IP stream and converts it back into HDMI for display. Together, the devices enable real-time, synchronized AV distribution for businesses and houses of worship looking to broadcast meetings or prayer services across multiple buildings.

INDUSTRY

Broadcast & Pro AV

CHALLENGES

Plum wanted to deliver a solution with high-quality video processing, low latency, and high-performance computing, all within a thermally efficient design.

SOLUTION

With the AMD Zynq™ UltraScale+™ adaptive SoCs, Plum supports 4K AV-over-IP in a compact, thermally optimized design that offers compute power to support current and future needs.

RESULTS

Powered by AMD FPGAs, Plum delivers reliable, high-performance AV solutions for applications such as digital signage, corporate communications, and live event broadcasting, all with minimal infrastructure requirements.

AMD TECHNOLOGY AT A GLANCE

AMD Zynq™ UltraScale+™ adaptive SoCs

"These firms will use the Plum Ultra encoders and decoders for in-room magnification. We're able to cut the 4K60 feed with the decoder and scale it down to 1080p, which is good enough for the participants in the room. We can then combine the video feed with Dante audio in the room for a simple, high-quality setup," said Kanjee.

The AMD Zynq adaptive SoC proved to be the best fit for Plum's processing and computing needs, offering the necessary thermal compatibility in their Dante AV Ultra line.

"FPGAs let us do much more than video, we have the ability to do video management," said Kanjee. "The AMD Zynq adaptive SoC gave us the processing power for what we need to do today but also the compute power and processing ability we need for the future."

RESULT

"We looked at other chip solutions, but they were very power hungry. Some were good with efficiency but could not process 4K video as smoothly as the AMD Zynq adaptive SoC," said Kanjee. "One other SoC we tried was good for audio, but didn't have enough processing power or bandwidth for video. The AMD Zynq adaptive SoC blew the others out of the water and was more cost-efficient."

One of Plum's customers is BAPS Swaminarayan Akshardham, a Hindu place of worship with the world's second-largest Hindu temple, based in Windsor, N.J. The site serves a community of about 10,000 visitors per day, with prayer services and other content broadcast across the campus for 13 to 14 hours each day. The 180-acre campus includes six buildings: the marble and stone temple, a museum, café, headquarters, welcome center, and assembly hall.

Prem Patel, a project manager overseeing technology integration at the site, said Plum's technology was a major improvement for the center. "We broadcast within the campus from one building to other, but also on global scale as well. We use them to broadcast rituals from the main monument that take place five times per day to other buildings on campus. The beauty of it is that we are able to broadcast 4K60 quality video anywhere. It doesn't matter the distance. It's about 1.5 kilometers from the main building to furthest away on campus, and there is no latency."

Patel said the campus was retrofitting a lot of different boxes and devices to broadcast content prior to installing the Plum boxes. "It was a nightmare," Patel said. "There were a lot of delays, and many broadcasts had video resolution issues. When it comes time for prayers, we want to make sure that everyone can take part. It was becoming a challenge."

"We put the Plum solution through rigorous testing. We set up a remote station two kilometers away and it worked perfectly. The AMD chip inside the device performs flawlessly. We used to have one solution for video and one for audio and we overlayed them, but syncing was an issue. With this box and Dante audio built in, it's a game-changer," Patel said.

Patel said in addition to the New Jersey campus, BAPS Swaminarayan also recently inaugurated a new campus in Syndey, Australia, with 118 endpoints using Plum boxes.

"We definitely had the support we needed throughout the design process," said Kanjee. "AMD was very collaborative. We explained our unique needs...what we wanted the chip to do, and they were quick to understand what we wanted and were easy to work with."

Want to learn more about AMD FPGAs?
Visit our website.

ABOUT PLUM

Plum makes audio-visual encoding and decoding solutions that enable businesses and organizations to broadcast live events, campuswide, in 4K resolution. The devices, Plum Ultra and AV-H, support uncompressed and compressed video formats, provide high video quality and minimal latency. Their compact and rugged design enhance reliability, making them suitable for broadcast, digital signage, corporate AV, and more.

https://plum-av.com/

ABOUT AMD

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