



## AMD Provides Twitch with Plug and Play VP9 Transcoding Solution for Live Video Streaming

Delivers 25% Cost Reduction with No Compromise to Video Quality

### AT A GLANCE:

Customer: Twitch.tv and Twitch Interactive, a subsidiary of Amazon

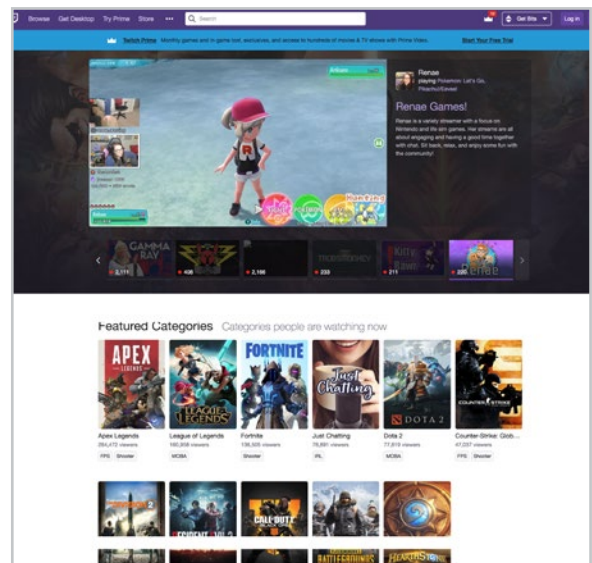
Industry: Entertainment; live video game and eSports streaming media

Headquarters: San Francisco, CA

Founded: 2011

Employees: 500+

[www.twitch.tv](http://www.twitch.tv)



### CHALLENGE:

Lowering the cost to stream real-time, broadcast quality video and scaling its delivery to millions of viewers worldwide.

### SOLUTION:

AMD Ultrascale+™ FPGA acceleration and NGCodec's VP9™ encoder IP for HD video compression and transcoding.

### RESULTS:

Twenty-five percent bitrate savings without compromise to live broadcast quality video (1080p at 60 fps). Achieved 120 frames per-second on a single FPGA representing a 30X performance improvement over CPU implementation.

**OVERVIEW:**

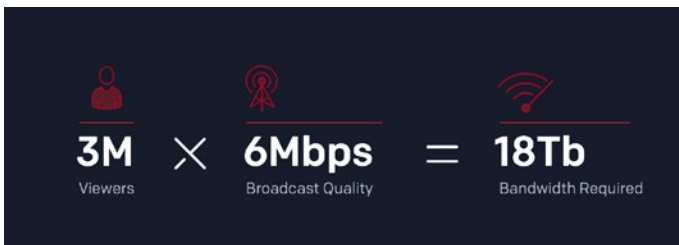
Online gaming and eSports are gaining in popularity and their participation and consumption, particularly by millennials, is rising dramatically. Twitch.tv is a live streaming media company that broadcasts interactive video game content and eSports to an audience of millions globally. The company, a subsidiary of Amazon, is the largest and fastest growing live streaming video platform in North America and the first to offer a free and interactive network for watching gaming and eSports competitions.

“The beauty of how AMD and NGCodec developed their solution is that no one at Twitch had to become an FPGA expert to use the technology. “

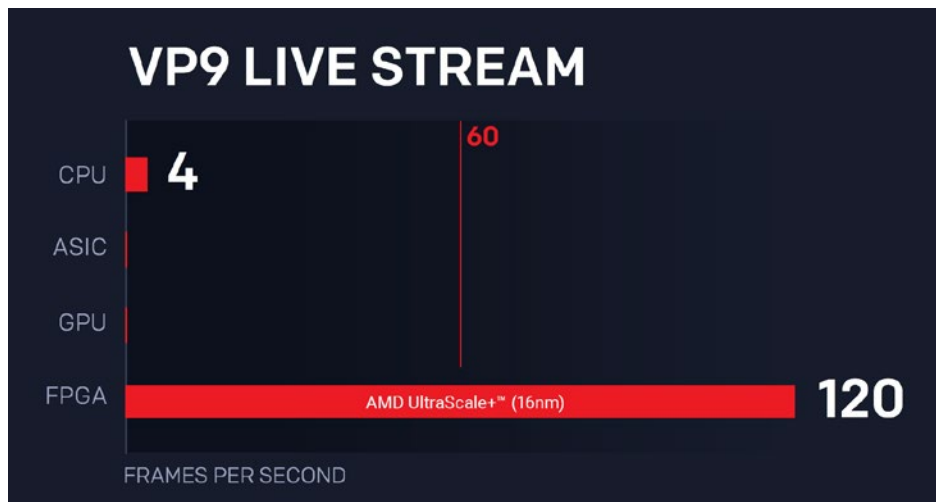
Twitch has made two innovative contributions to the live streaming industry. 1) It has greatly reduced the barrier to entry for live broadcast. On Twitch, anyone can broadcast free using a simple setup and Internet connection. 2) It has created a new broadcast paradigm based on real-time interaction between broadcasters and audience, which is what makes Twitch content so interesting to watch. The audience uses chat to interact with the game player during the broadcast session and the player responds to viewer comments while the game takes place.

As Twitch’s viewership for interactive content grew rapidly to more than 3 million concurrent viewers each requiring 6Mbps bitrate, the company faced significant limitations in computer server bandwidth and latency in its data centers. To scale delivery of its live video streaming services for peak demand, the company spun up more and more servers at considerable operating expense.

Dr. Yueshi Shen, Principal Research Engineer at Twitch, led the video transcoding project and successfully implemented the VP9 encoder IP from [AMD partner NGCodec](#) without the need to know about FPGA design or hardware engineering. [NGCodec’s VP9 encoder](#) is available for on-prem private cloud deployments and on the [AWS marketplace](#).



Dr. Shen said, “The beauty of how AMD and NGCodec developed their solution is that no one at Twitch had to become an FPGA expert to use the technology. We didn’t have to change the way we interface with our streaming technology, so this saved significant time and allowed us to simply plug into the VP9 transcoding solution with minimal work.” Dr. Shen found that the AMD and NGCodec solution significantly reduced its operating cost without compromising



the quality of its video or the immersive and interactive viewer experience. For example, at peak demand last year Twitch data centers streamed content totaling 18 terabits per second over the internet.

Dr. Shen explained, “VP9 is the most widely supported next-generation video format, so viewers can consume our content on a variety of different devices and browsers. It is the only video compression format

that we can put into production and still meet our bitrate savings goals. Encoding VP9 actually requires a lot of computation power. We found in our implementation that even on high-end CPUs, we can only achieve 4 frames per second, which is not even close to our live streaming requirement of 60 fps. There are no ASIC or GPU solutions for us to even consider. With AMD FPGA acceleration we were able to reach 120 fps on a single FPGA and become the first company in the industry to deploy VP9 streaming at broadcast quality. We strongly recommend that the entire streaming industry look at VP9, FPGA acceleration.”

## ADDITIONAL RESOURCES:

[AMD UltraScale Architecture](#)

[Twitch.tv](#)

[XDF Keynote](#)

## DISCLAIMERS

The information contained herein is for informational purposes only and is subject to change without notice. While every precaution has been taken in the preparation of this document, it may contain technical inaccuracies, omissions and typographical errors, and AMD is under no obligation to update or otherwise correct this information. Advanced Micro Devices, Inc. makes no representations or warranties with respect to the accuracy or completeness of the contents of this document, and assumes no liability of any kind, including the implied warranties of noninfringement, merchantability or fitness for purposes, with respect to the operation or use of AMD hardware, software or other products described herein. No license, including implied or arising by estoppel, to any intellectual property rights is granted by this document. Terms and limitations applicable to the purchase or use of AMD's products are as set forth in a signed agreement between the parties or in AMD's Standard Terms and Conditions of Sale.

## COPYRIGHT NOTICE

© Copyright 2023 Advanced Micro Devices, Inc. All rights reserved. Xilinx, the Xilinx logo, AMD, the AMD Arrow logo, Alveo, Artix, Kintex, Kria, Spartan, Versal, Vitis, Virtex, Vivado, Zynq, and other designated brands included herein are trademarks of Advanced Micro Devices, Inc. Other product names used in this publication are for identification purposes only and may be trademarks of their respective companies. AMBA, AMBA Designer, ARM, ARM1176JZ-S, CoreSight, Cortex, and PrimeCell are trademarks of ARM in the EU and other countries. PCIe and PCI Express are trademarks of PCI-SIG and used under license. PID 1870060