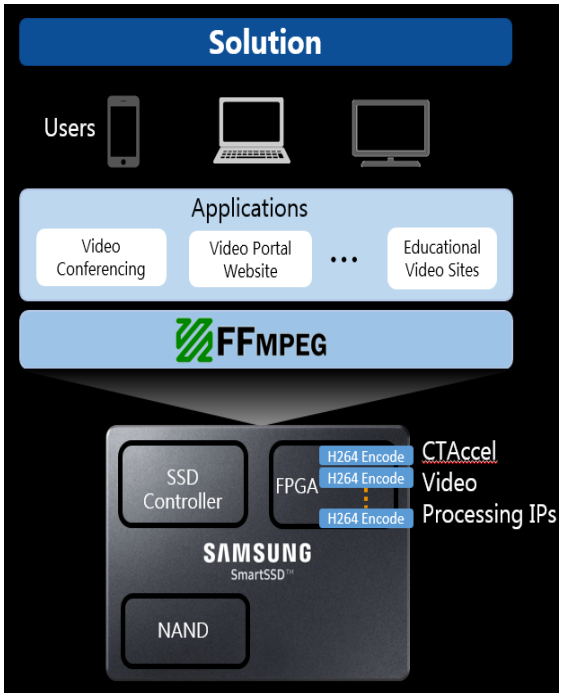
SOLUTION BRIEF

CTAccel Video Processing Acceleration on Samsung SmartSSD® CSDs powered by Xilinx FPGAs

CHALLENGE: CPU Performance is not Keeping Pace with Growth of Video Workloads

Internet companies are dealing with 26-33% growth in video data, driven by video sharing services and video conferencing. As users share video on social media and access video from multiple devices, this generates massive video processing and transcoding workloads in internet data centers. However, improvements in CPU performance are not keeping pace with the increased computation workload.



Accelerate Video Processing with SmartSSD CSDs and CTAccel

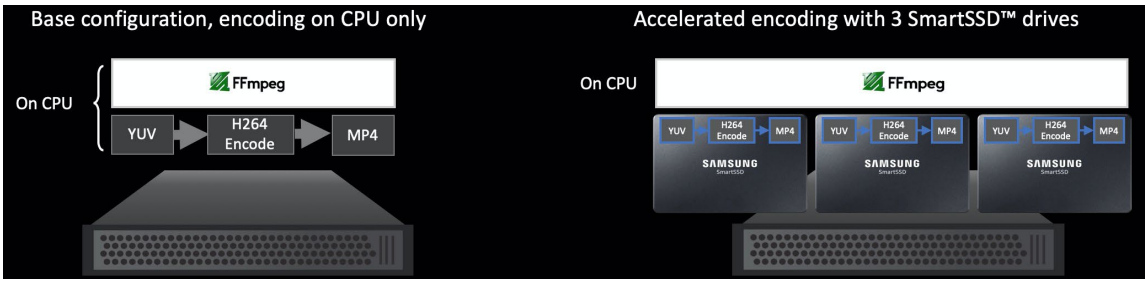
Samsung SmartSSD CSDs and CTAccel IP together significantly reduce the number of video processing servers needed to handle video transcoding workloads. This allows data centers to scale to meet the growing demand for video processing.

Fast: The SmartSSD drive combines a Samsung enterprise-class SSD (Solid State Drive) with a Xilinx FPGA accelerator in one device, enabling fast computation on data directly where it is stored. CTAccel's video processor IP uses this computation power to perform faster H.264 encoding and offload the overloaded data center CPU resources.

Scalable: A single server can be equipped with up to 24 SmartSSD drives. Each SmartSSD drive can run video encoding acceleration in parallel, producing almost linear speedup.

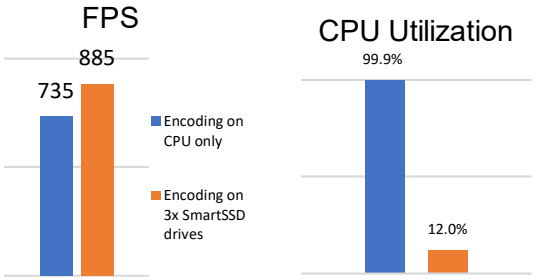
Easy to deploy hardware: High capacity, compact U.2 form factor SmartSSD drives connect using existing SSD PCIe lanes.

Easy to deploy IP: CTAccel video acceleration is fully compatible with FFmpeg, the most popular open-source video processing software. This level of integration with mainstream video processing software makes for a seamless migration from conventional (CPU-intensive) software-based encoding to faster SmartSSD drive-based encoding.



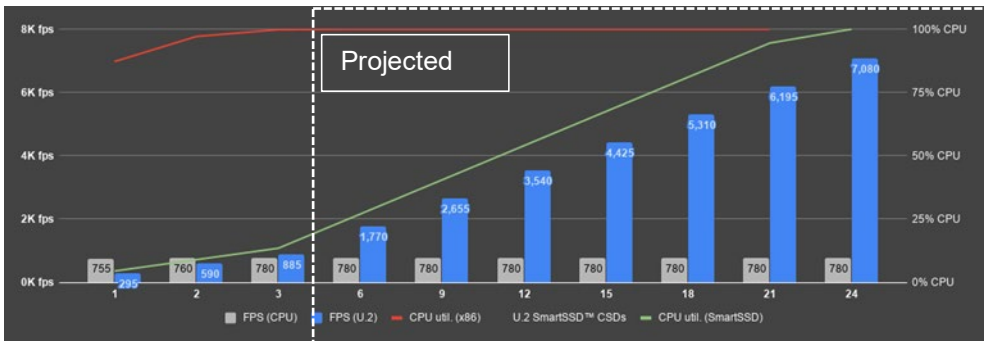
PERFORMANCE

CPU Offload: The following result demonstrates the CPU offload of three SmartSSD CSDs connected to a single server. As compared with standard SSDs and software-based encoding on the CPU, the SmartSSD drives deliver similar maximum FPS throughput but at just 10% of the CPU utilization.



Test Environment - Video Resolution: 1920x1080, CPU: Dual Intel® Xeon® Gold 6152 @ 2.1GHz, Server: Dell R740, OS: CentOS Linux release 7, Accelerator: SmartSSD Drives

Scalable Acceleration: Adding more SmartSSD drives further increases the available CPU offload capacity and internal bandwidth. 24 SmartSSD drives deliver 10x more video frames per second per server, illustrating the transcoding infrastructure savings potential.



	Item	Specification
CTAccel IP and Software	Input/ Output Format	YUV / YUV, RBG, TS, ES
	Host Operating System	CentOS, Ubuntu, Debian
	Resolution	Up to 1920x1080
Samsung SmartSSD® Drives	SSD	Enterprise Class SSD with Samsung V-NAND, 4TB capacity
	Acceleration Engine	Xilinx Kintex UltraScale+ FPGA
	Form factor	U.2
	Host interface	PCIe Gen 3x4

TAKE THE NEXT STEP

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