Whitepaper

PIXFLEX™ Hb architecture that powers world's first Hybrid Video Processing Appliance

It is known that software-based video processing is a very versatile environment, since such processing runs directly on the COTS (Customer Off The Shelf) based CPU of the host system. Given that a COTS CPU is a highly versatile component which performs any instruction given to it, numerous A/V processing algorithms can be run on it at the same time to achieve a highly configurable workflow. While software-based processing provides us with the benefit of versatility but at a higher power usage, it falls short in the ability to run multiple such complex algorithms in large numbers due to processing constraints and the ability to give a good cost per stream advantage, when the number of streams dramatically scale up . With today's processing and compression technology becoming more complex to achieve better performance, the current CPU architecture does not provide the required processing power to meet the current market requirements.

On the otherhand coming to hardware-based video processing, it is a fact that this method does not have the processing power constraints. This is a consequence of such hardware's built specifically to perform only a set instruction/algorithm. Currently such hardware is available in the form of a GPU (Graphics Processing Unit) or a VPU (Video Processing Unit). A GPU with the current latest technology is somewhere between a CPU and a VPU, wherein it can do video-processing application as well as AI application as its primary objective. A VPU on the other hand is designed and built to perform video-processing as its primary objective.

VPU's provide the capability to perform video-processing of the more complex compression algorithms such as H.264, HEVC and AV1. While being able to perform this complex process, the VPU's can perform the same at a larger number of target streams than would be possible with CPU's or GPUs. By virtue of such VPU's running in a host system, the bulk of the processing workload is offloaded onto the VPU. This free's up the CPU to perform the menial tasks to handle the VPU and packaging of streams for delivery.

The market segment across the video food chain, would like processing flexibilities with respect to CODECS and be able to serve multi format environment simultaneously as well. Beyond this in the IP Video processing world, the work flow dynamism calls for a constant change in managing meta data and also the parameters associated with format packaging – that includes new formats being introduced.

This necessitates an appliance or a processing infrastructure that can simultaneously process video in software and be able to use additional VPU HW infrastructure. And be flexible enough to manage across the tasks across both SW and SW accelerated video processing along with VPU HW and related accelerated video processing.

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RiverSilica Technologies which has been in the forefront of cutting edge Video Processing Technologies, has come up with a pipeline architecture which is an upgrade from it's current PIXFLEX™ pipeline architecture which forms the basis of it's flagship product line PIXFIX™ Versa.

The new upgraded PIXFLEX™-Hb architecture forms the basis for it's world's first Hybrid processing capable Video Processing appliance PIXFIX™ Torq series. This architecture crafted with multi pipeline approach with its ability to direct video processing across COTS CPU and VPU simultaneously and be able to configure the required work flows based on the available total processing capacity and the need for the best in class cost per stream and associated Return on Investment.

Given the circumstances the PIXFLEX™-Hb has interleaving directors which can manage the incoming stream to be flexibly piped between the COTS and VPU and also has the capability to receive across multiple types of interfaces to achieve the video processing goals. The architecture has the capability to add future interfaces for receiving the video, be able to manage the future packaging formats along with the capability to keep alternating across different types of VPUs.

PIXFLEX™-Hb architecture powers the PIXFIX™ Torq series of products with its unmatched flexibility to help in bringing the customer to pack more and more streams in a single appliance with the flexibility of multiple interfaces and multiple formats. The architecture has helped the customer to reduce the cost per stream by 3 to 5 times and also has been able to bring down the OPEX costs – particularly the need for power by a minimum of 3 times given the number of appliances to be used.

For further information on PIXFLEX™ architecture and PIXFIX™ product line contact info@riversilica.com

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