

# Aupera: Smart World Video AI Analytics



## INTRODUCTION

Many aspects of life are utilizing video analytics to solve real problems and make business and people’s lives smarter, whether this is Smart City applications that monitor traffic congestion, parking lot availability and detect crime, to monitoring COVID-19 requirements for face masks and social distancing, to a Smart building where secure points can be controlled via facial recognition for far better security than a badge. However, these applications are complex and require deterministic low latency, requiring an architecture that can deliver performance while maintaining an advantageous TCO.

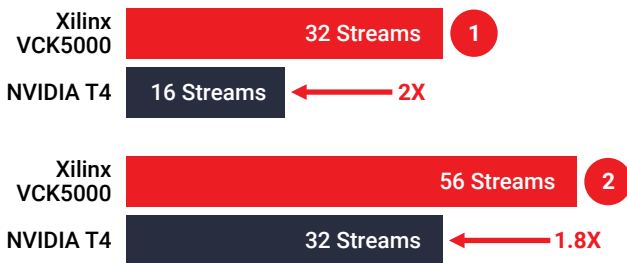
Aupera’s Smart World solution, built on Xilinx Alveo® accelerator cards, Versal ACAP, and Zynq™ SoCs, delivers high throughput, low latency with unsurpassed performance at a low hardware investment, assuring best-in- class TCO.

Built on the integration of the Xilinx Video Machine Learning Streaming Server (VMSS) framework with Aupera’s AupXStream video analytics pipeline processing, these solutions enables hassle free field deployment even with custom models.

## SOLUTION OVERVIEW

Aupera Smart World video AI solutions support very high density of video feeds from multiple full HD cameras for object identification and classification. The additional unique proposition of this solution is its ability to run multiple inferencing models concurrently and deliver accurate results at a deterministic low latency, resulting in industry-leading low Total Cost of Ownership (TCO).

## THROUGHPUT ADVANTAGE



## TCO ADVANTAGE



## FEATURES AND BENEFITS

### Full FPGA Accelerated Pipeline

- > Real-time, low-latency, high throughput
- > Concurrent multi-model inference
- > Best-in-class accuracy

### Best-in-Class TCO

- > Fewer servers and Lower power
- > Fast deploying, turnkey solution

### Adaptable & Extensible Framework

- > Ready for edge, datacenter, and cloud deployment
- > Support for 3rd party plugins
- > Standard API interface

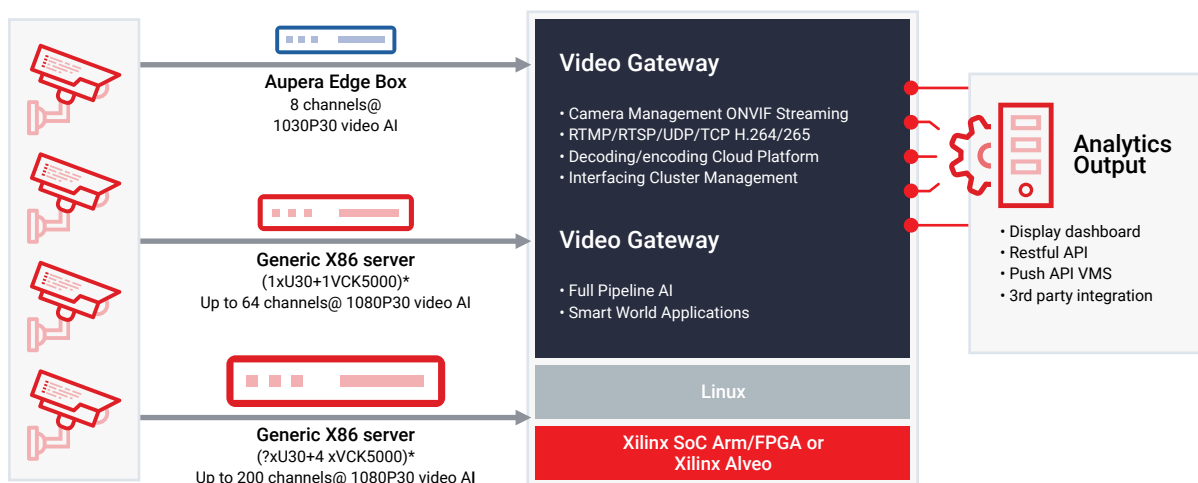
**1** AI model: YoloV3+: Resnet 18  
HW: 1x Xilinx VCK5000 vs 1 x Nvidia T4

**2** AI model: Resnet 50 & TinyYoloV3  
HW: 1x Xilinx VCK5000 vs 1 x Nvidia T4

**Notes:**  
Results from PoC at major global retailer 32 cameras/store  
Res:1080P30fps  
AI model: Resnet 50 & TinyYoloV3  
HW: (1 x U30 + 1 x U50LV) vs 3 x Nvidia T4

## SOLUTION DEPLOYMENT

Aupera’s video AI solution provides a full software stack that encompasses video gateway (video decoding/encoding/ streaming & processing), ready to deploy AI models for inference acceleration and a standard API for easy integration with 3rd party software platform. The solution can be deployed on the edge or a regional data center.

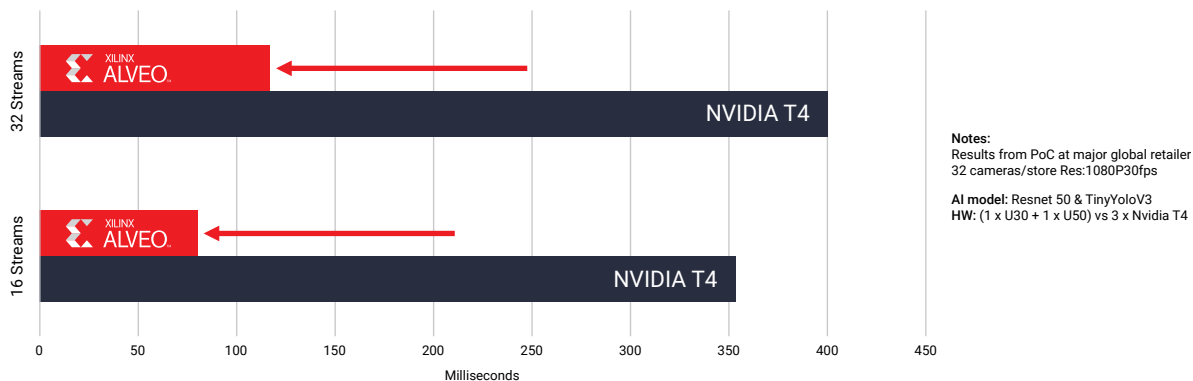


\* Note: Multiple cards can be flexibly configured. Current validated servers include: Boston StreamAI server, Dell, Lenovo, Gigabyte, Supermicro. (Specific model information upon request)

The Aupera Smart World solution supports high density video feeds from multiple full HD cameras. The Alveo U30 executes the video decode, scaling and preprocessing and the Alveo U50 accelerator runs multiple models needed for AI inference. The number of channels (video streams) and concurrent AI models can be increased by simply adding more Alveo accelerator cards.

## LOWER DETERMINISTIC LATENCY

The VMSS framework delivers end-to-end pipeline acceleration by running pre- and post-processing as well as inferring on the FPGA fabric, delivering deterministic latency about 75% lower than the GPU-based competition in a typical large retailer 32-camera store deployment.



## TAKE THE NEXT STEP

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