AMD
ALVEO U55C

Accelerating Sensor Signal Processing with the AMD Alveo™ U55C Card

OVERVIEW

The explosion of sensors at the edge has accelerated the need to process data in real-time. Sensor processing applies mathematical and practical application of signal processing algorithms that learn, reason, and act. Signal processing techniques have broad usage for compute-intensive applications ranging from data analytics to machine learning.

The Alveo™ U55C accelerator card is ideally suited for processing terabytes of sensor data in real time via distributed processing across hundreds of network attached accelerator cards. Built from the ground up to deliver the best performance-per-watt for HPC and Big Data workloads, the Alveo U55C accelerator delivers data pipeline hyper-parallelism, superior memory- management, and optimized data movement.

HIGHLIGHTS

Massive Throughput at Scale Across HPC Signal Processing Cluster

> Can process terabytes of real-time sensor data across hundreds of cards

> 200Gb/s of network throughput per card to scale out across Ethernet

Dense Compute for Superior Performance-per-Watt

> Hardware accelerated data pipeline for hyper-parallelism

> Adaptable memory hierarchy for optimal data movement

> Massive memory bandwidth via HBM2 to eliminate compute bottlenecks

Simplified Scaling through Open-Standards Based Clustering

> Leverages RoCE v2 for an API-driven clustering solution

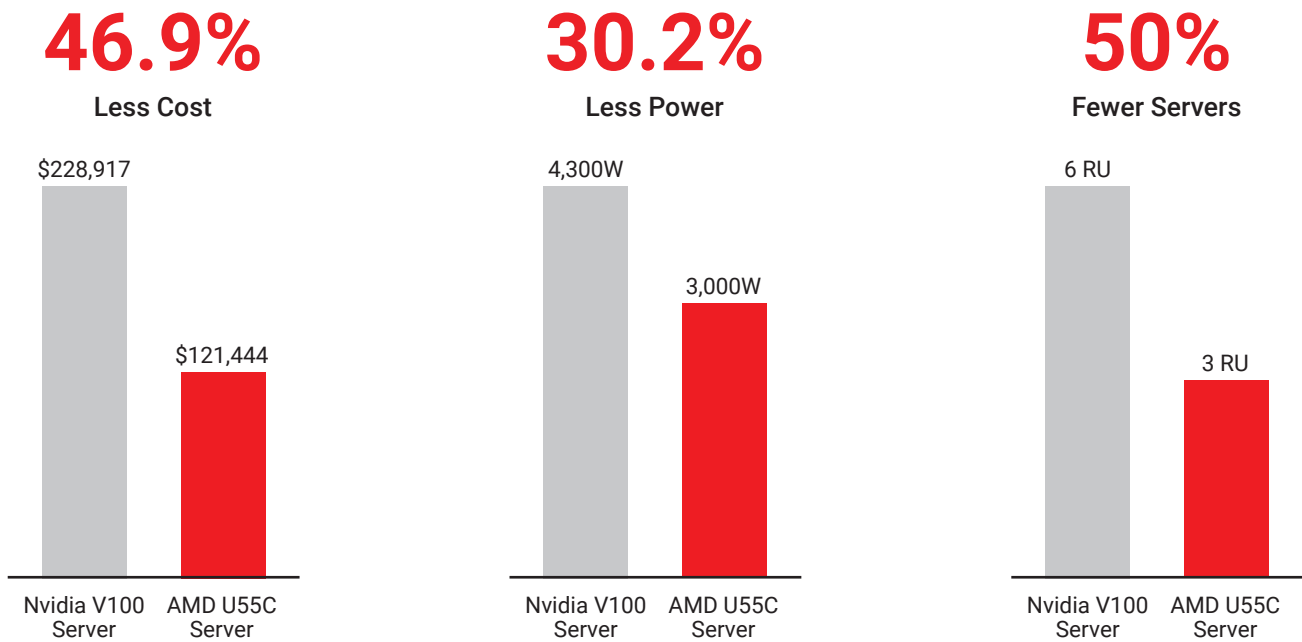> Scale hundreds of cards across existing server and network infrastructure

END-APPLICATIONS

> Biomedical imaging

> Computer vision and 3D modeling

> Machine learning

> Energy management

> Pattern recognition and analysis

> Precision farming

> Radio astronomy

> Traffic monitoring

> Weather forecasting

REAL-TIME RADIO ASTRONOMY WITH THE AMD ALVEO™ U55C

One of the world's largest radio astronomy antenna arrays has built an HPC cluster consisting of 400+ Alveo U55C cards and 20 P4 switches that perform end-to-end signal packet processing on incoming data at a total throughput of 15Tbps. Each Alveo FPGA in the beamformer implements end-to-end signal processing at a fraction of the bandwidth, while requiring half the number of servers and less than half the power compared to commodity GPUs for significant cost savings.

Read the **case study** to learn more.

Alveo U55C Delivers Superior Cost Savings, Area & Power Efficiency than GPU Implementations

46.9%
Less Cost

$228,917

$121,444

Nvidia V100 Server   AMD U55C Server

30.2%
Less Power

4,300W

3,000W

Nvidia V100 Server   AMD U55C Server

50%
Fewer Servers

6 RU

3 RU

Nvidia V100 Server   AMD U55C Server

TAKE THE NEXT STEP

Learn more about the Alveo U55C accelerator card at **www.xilinx.com/u55c**
Learn more about AMD big data solutions at
www.xilinx.com/applications/data-center/database-data-analytics.html