XILINX Data Center Update

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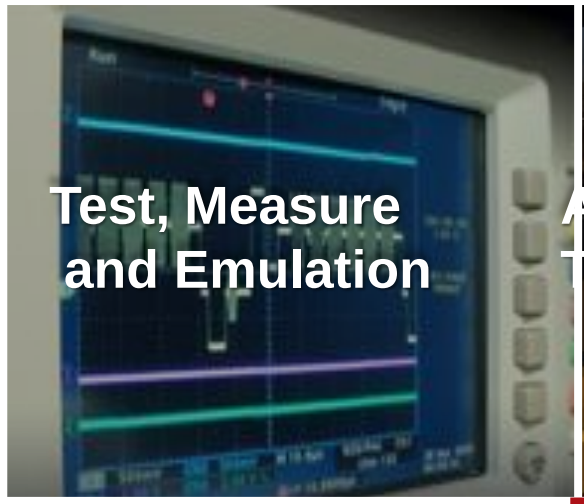
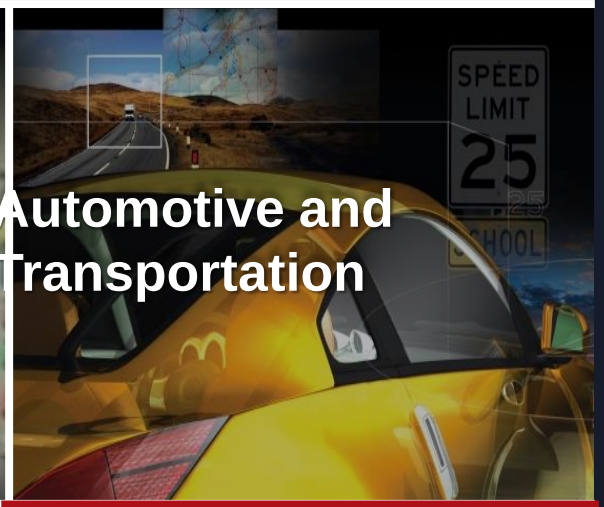
XILINX

$3.0B	~4,400	20K+	60+	4,000+
Revenue	**Employees Worldwide**	**Customers**	**Industry Firsts**	**Patents**

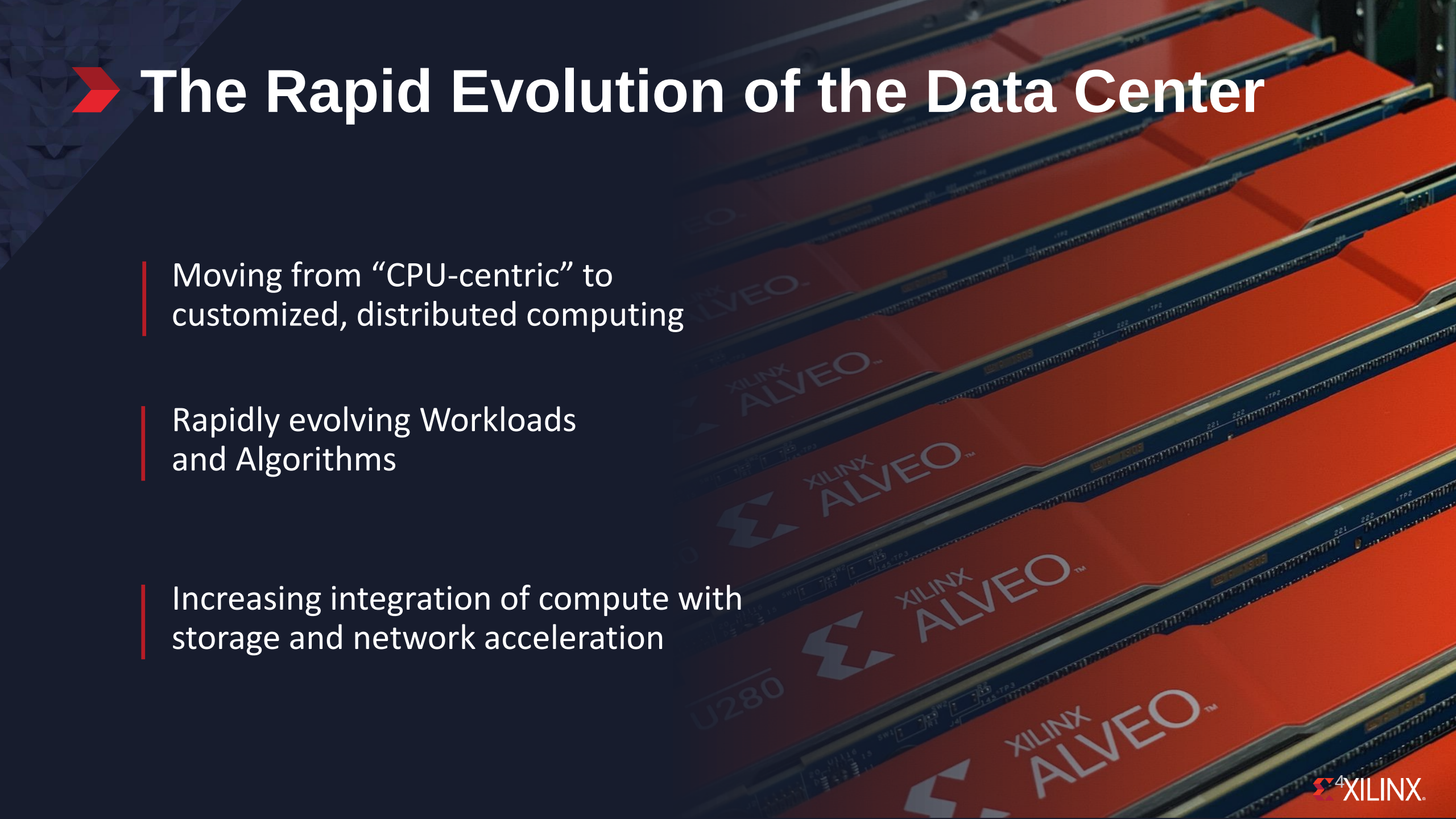
A Multi-Market Semiconductor Company



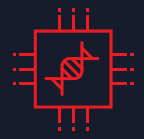


The Rapid Evolution of the Data Center

- Moving from “CPU-centric” to customized, distributed computing
- Rapidly evolving Workloads and Algorithms
- Increasing integration of compute with storage and network acceleration



One Acceleration Platform. Broad Impact.



90x

Genomic Data Analytics

illumina®

30x

Video Transcoding

twitch

12x

ML Inference for Speech Recognition

SK telecom

5x

Compression, Encryption, Database Offload

SAMSUNG

20x

Ultra-Low Latency Networking

ALGO-LOGIC®

XILINX

ALVEO™

FAST

Built for high throughput, ultra-low latency

Accelerate compute, networking, storage

ADAPTABLE

Deploy optimized domain-specific architectures

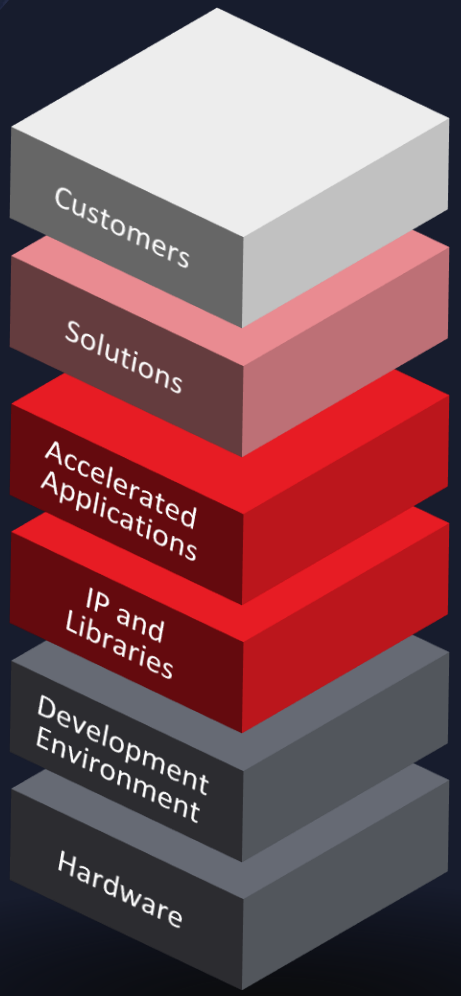
Adapt to changing algorithms

ACCESSIBLE

Deploy in the cloud or on-premises

Rich set of accelerated Applications

ALVEO Solution Stack



End Customers

Solution Providers

App & IP Developers

Channel Partners

Data Analytics	Video & Image Processing	Machine Learning	HPC & Life Science	Financial Computing

Titan IC, NGCODEC, edico genome, MAXELER Technologies, DEEPHI, PLUNIFY, CTACCEL, DEEPOLY, Falcon COMPUTING, Mipsology, byte LAKE, XELERA, BLACKLYNX, skreens, swarm64, ALGO-LOGIC, VITESSE DATA, MEGH COMPUTING, boon, V-NOVA, Nextera Video, bigstream, RENIAC, inaccel, BigZetta Systems, LegUp, mle

aws, Microsoft Azure, Tencent Cloud, NIMBIX, SUPERMICRO, inspur, DELL, Alibaba Cloud, Baidu 百度

CLOUD

ON-PREMISE

Growing Ecosystem

Data Analytics

bigstream
BLACKLYNX
swarm64
XELERA
inaccel
VITESSE DATA
BigZetta Systems
LegUp
RENIAC
SumUp

Life Sciences & HPC

illumina
byte LAKE
inaccel
Falcon COMPUTING
MAXELER Technologies
deCODE Genetics

Video Processing

NGCODEC
V-NOVA
MEGH COMPUTING
Nextera Video
skreens
VYUSYNC

Machine Learning

Mipsology
DEEPHI 深鉴科技
XELERA

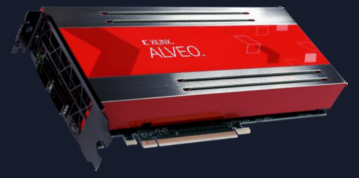
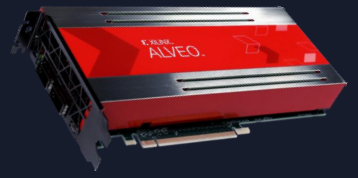
Financial Computing

ALGO-LOGIC
MAXELER Technologies
SciComp

Image Processing

DEEPOLY
CTACCEL

Xilinx Alveo Product Lineup

ALVEO™ U50	ALVEO™ U200	ALVEO™ U250	ALVEO™ U280
			
UltraScale+ Architecture	UltraScale+ Architecture	UltraScale+ Architecture	UltraScale+ Architecture
872k LUTs	1,182k LUTs	1,728k LUTs	1,304k LUTs
Single slot, half height	Dual slot, full height	Dual slot, full height	Dual slot, full height
8GB HBM2, 460GB/sec	64GB DDR, 77GB/sec	64GB DDR, 77GB/sec	8GB HBM2, 460GB/sec
PCIe Gen3, Gen4, CCIX	PCIe Gen3	PCIe Gen3	PCIe Gen3, Gen4, CCIX
1x QSFP 28 (100GbE)	2x QSFP 28 (100GbE)	2x QSFP 28 (100GbE)	2x QSFP 28 (100GbE)
< 75W	< 225W	< 225W	< 225W

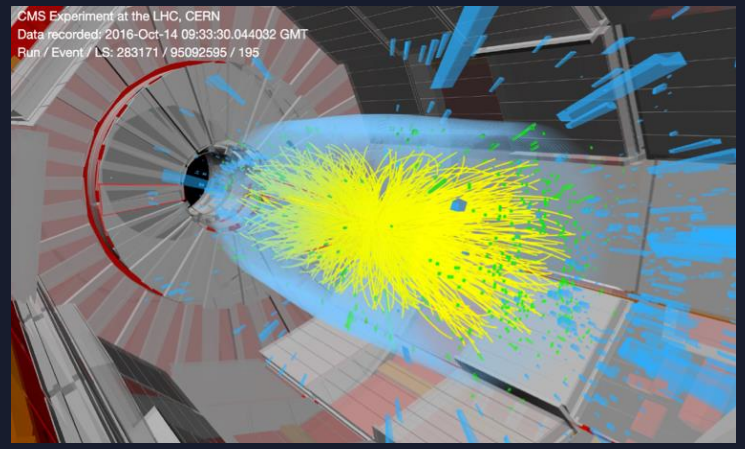
Top Emerging Use Cases for FPGAs in HPC

Use Case	Acceleration	Solution Providers	FPGA Value Prop
Weather Simulation	Simulating atmosphere / Shallow water Equation	MAXELER Technologies; byte LAKE; edico genome; Falcon COMPUTING; XILINX	14x Speed up
Oil and Gas Seismic Imaging	Acoustic wave equation		10x energy efficiency
Physical simulation, QCD, CFD	1D 2D 3D FFTs, stencil kernels		Mixed Precision, Deep execution pipelines, higher on-chip memory
Bioinformatics, protein folding and molecular dynamics	Monte Carlo Simulation		10x Speed Up
Genomics / Personalized Medicine	Gene Sequencing		10x - single human genome
HPC + ML	Inference Acceleration		Adaptive learning
Computation offload and communication	Fine grain partial offload + high speed interconnect		High BW ,Ultra low latency inter-node communication

AI Accelerated Dark Matter Search (CERN)

Real-time ML Inference + Sensor pre-processing

Achieving 100ns Inference Latency on 150 Terabytes/Second Data Rates
Unachievable by CPUs & GPUs



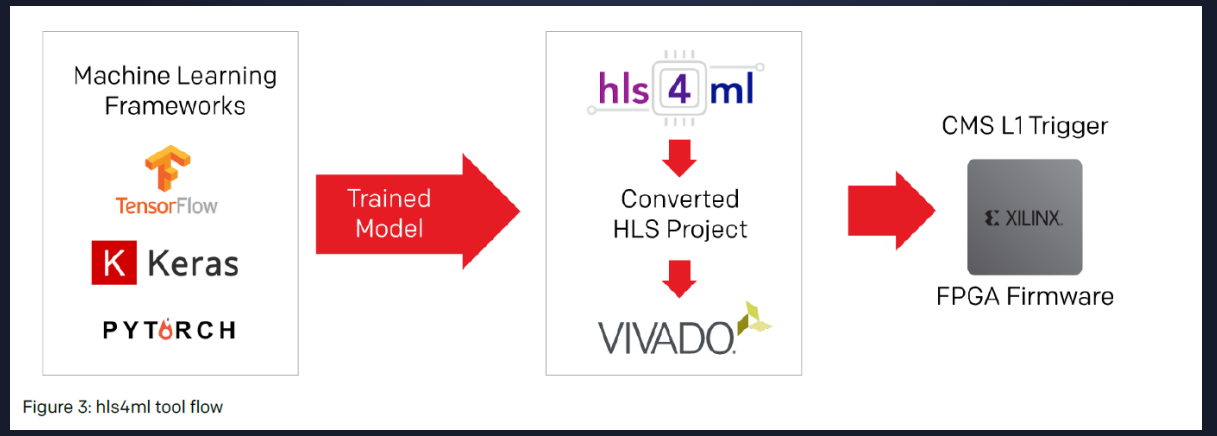


Figure 3: hls4ml tool flow

https://www.xilinx.com/content/dam/xilinx/publications/powered-by-xilinx/cern-case-study-final.pdf

One Platform. Broadest Capability

	CPU (Sequential)	GPU (Parallel)	Alveo (Sequential + Parallel)
			
3rd Party Applications	●	●	●
High Level Coding	●	●	●
Complex Memory & Datapath			●
Adaptable Hardware			●
AI Inference + Pre/Post Process			●
On-board Networking			●