Building the Adaptable Intelligent World

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Disruptive Innovation
Transistor

1940s
Computing
1970s
Distributed Computing
1990s
Mountains of Unstructured Data

One Architecture Can’t Do It Alone

This is the Era of Heterogeneous Compute
Today’s Developer Needs

Software programmability

Performance for a diverse range of applications

Adaptability to keep pace with rapid innovation
Today’s Solutions

- CPUs
- Fixed Function Accelerators: ASICs/ASSPs/GPUs
- FPGAs
Disruptive Innovation Needed: Enter ACAP

A new class of devices for today’s challenges
ACAP
Adaptive Compute Acceleration Platform
Adaptive Hardware for Domain-specific Applications
Adaptive Compute Acceleration

Scalar Engines

Adaptable Engines

Intelligent Engines
Platform

ENABLING:
Data Scientists
SW App Developers
HW Developers

Development Tools
HW/SW Libraries
Run-time Stack

SW Programmable
Silicon Infrastructure
Versal ACAP Technology Tour

- Scalar Processing Engines
- Adaptable Hardware Engines
- Intelligent Engines SW Programmable, HW Adaptable
- Breakout Integration of Advanced Protocol Engines
Scalar Processing Engines

- Arm Cortex-A72 Application Processor
- Arm Cortex-R5 Real-Time Processor
- Platform Management Controller
Adaptable Hardware Engines

Re-architected foundational HW fabric for greater compute density
Enables custom memory hierarchy
8X Faster Dynamic Reconfiguration (“on-the-fly”)
Intelligent Engines

DSP Engines
High-precision floating point & low latency
Granular control for customized datapaths

AI Engines
High throughput, low latency, and power efficient
Ideal for AI inference and advanced signal processing
AI Engines

Optimized for AI Inference and Advanced Signal Processing Workloads

- >1GHz VLIW/SIMD vector processor cores
- Massive array of interconnected cores with local memory
- Tightly coupled to adaptable hardware enabling custom memory hierarchy
- Software programmable with hardware adaptability
Network-on-Chip (NoC)

Ease of Use
Inherently software programmable
Available at boot, no place-and-route required

High Bandwidth and Low Latency
Multi-terabit/sec throughput
Guaranteed QoS

Power Efficiency
8X power efficiency vs. soft implementations
Arbitration across heterogeneous engines
## Comprehensive Tool Chain

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IN SUMMARY

**Versal ACAP**
Heterogeneous Acceleration
For Any Application
For Any Developer

**Delivers**
Disruptive Innovation
Software Programmability
Hardware Adaptability
Whole Application Acceleration
Adaptable
Intelligent