SiFive Overview

FOR RISC-V 2nd week in Paris only

October 2019

Silicon At The Speed Of Software

SiFive in a nutshell

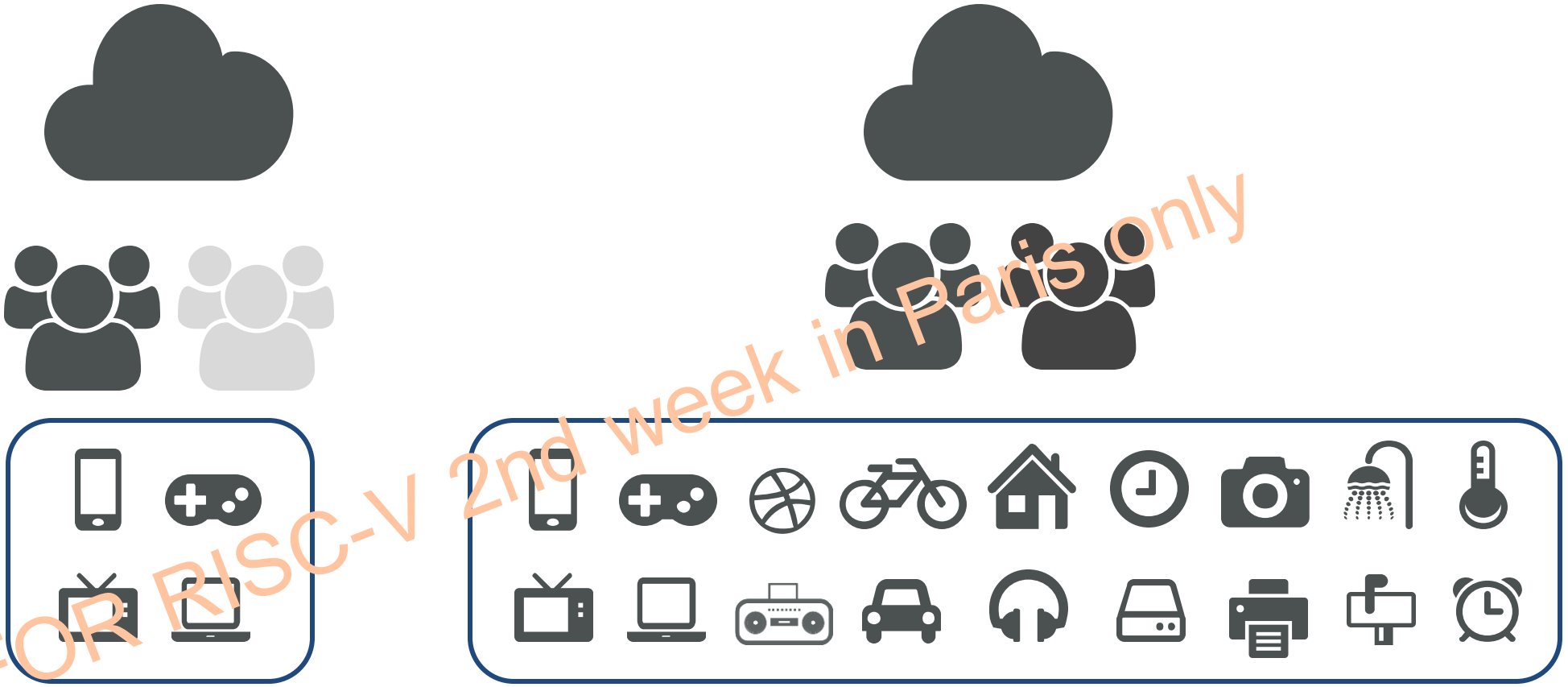
450
employees
(and hiring)

15
offices

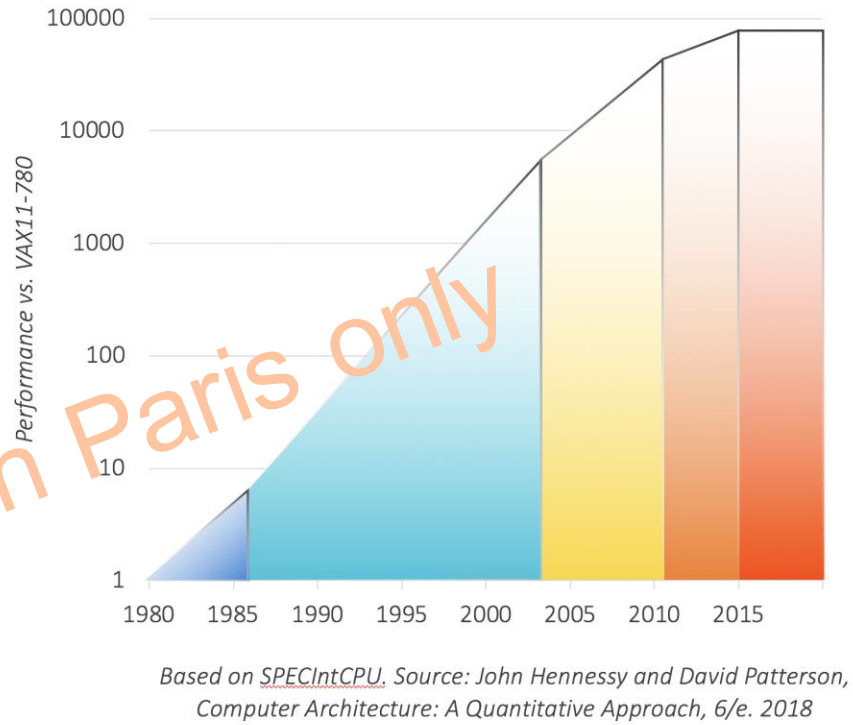
16+
SiFive CoreIPs

120+
design wins

Massive Growth in Devices & Data



Compute Needs Are Changing



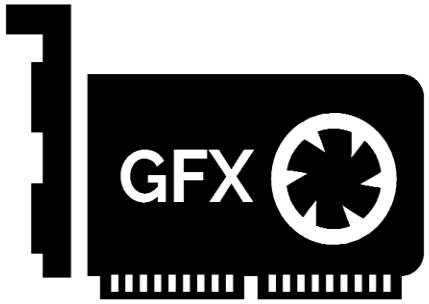
Based on SPECIntCPU. Source: John Hennessy and David Patterson, Computer Architecture: A Quantitative Approach, 6/e. 2018

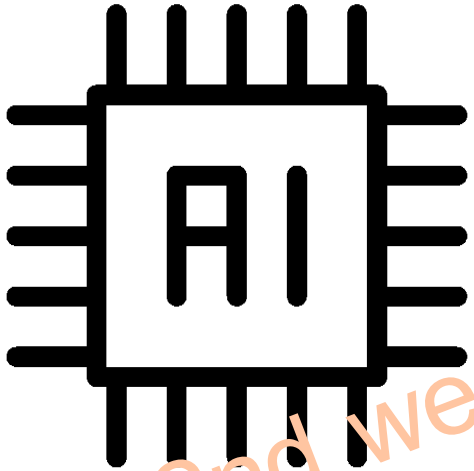
e.g., machine learning

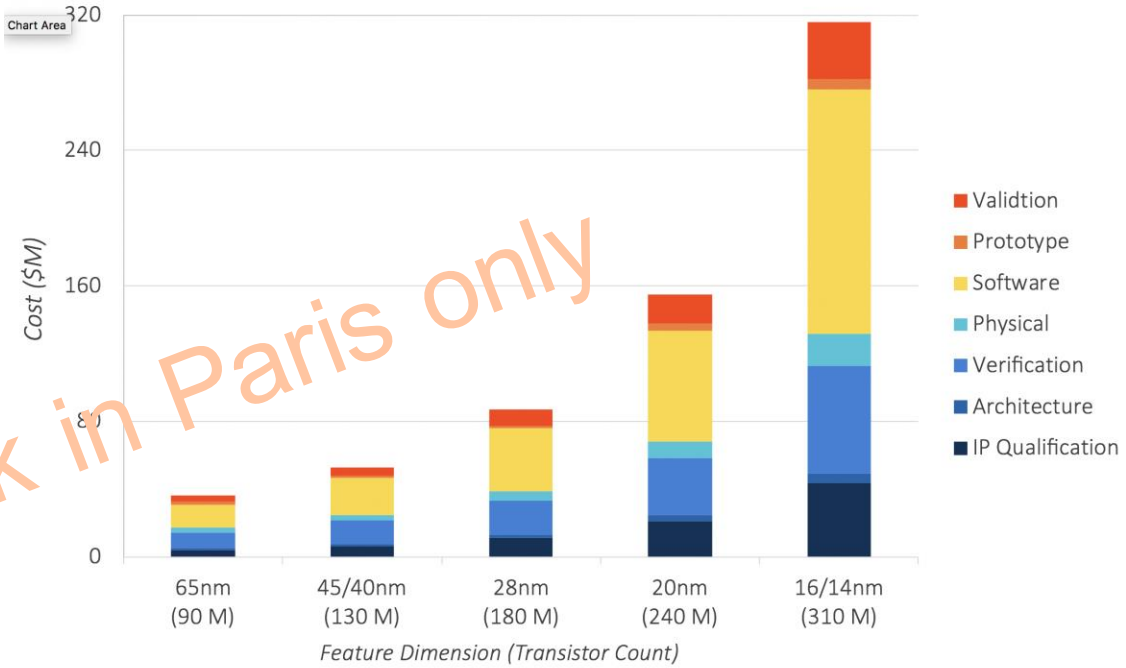
But, CPUs are not getting faster!

Source: Medium, Entering the world of Machine Learning

Hardware Trends: Custom Hardware To The Rescue!







GPUs

Custom Chips (e.g., Google TPU)

But, custom chip development costs are too high!

Embedding Intelligence: From the Edge to the Cloud

U Cores

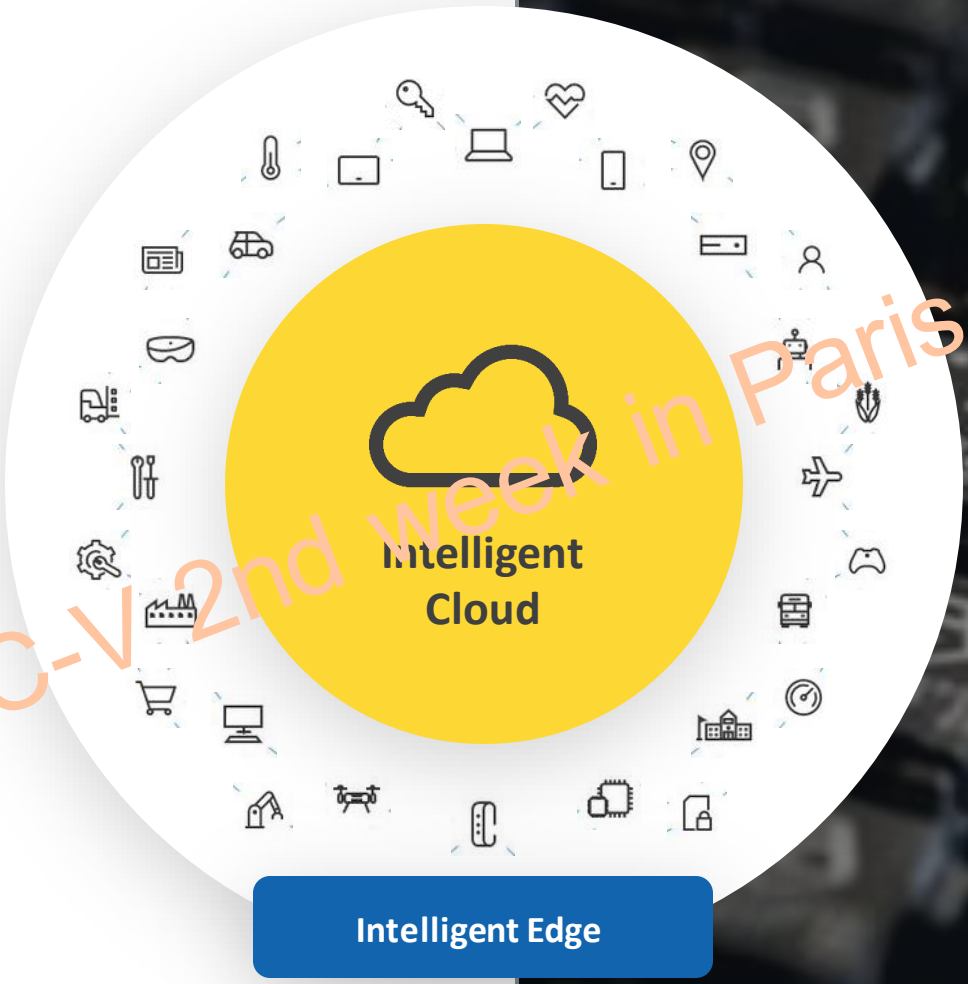
64-bit Application Processors

S Cores

64-bit Embedded Processors

E Cores

32-bit Embedded Processors



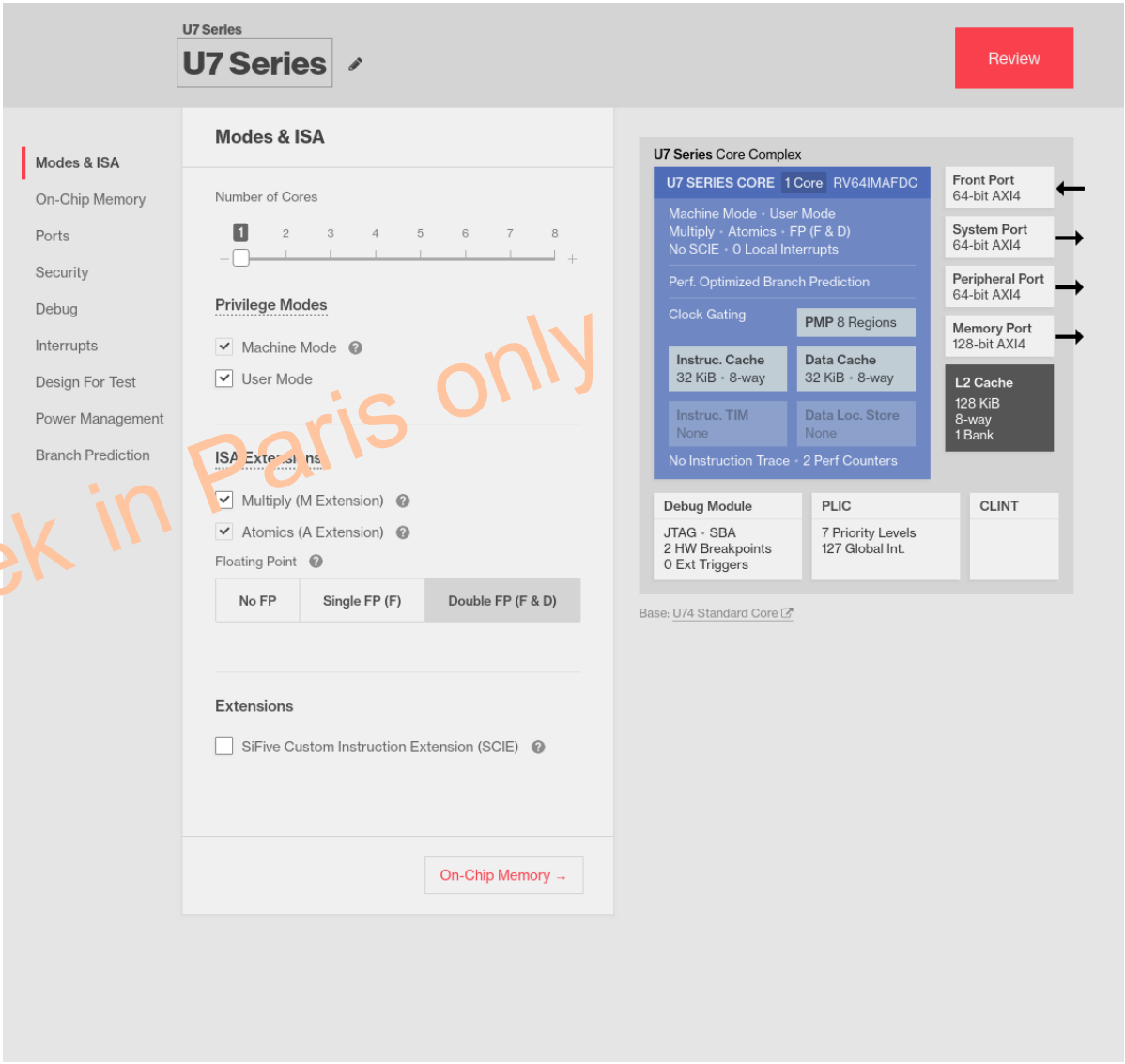
Embedding Intelligence from the Edge to the Cloud

SiFive Core IP RISC-V Configurable Cores

	E Cores — 32-bit embedded cores: MCU, edge computing, AI, IoT	**S Cores** — 64-bit embedded cores: Storage, AR/VR, machine learning	**U Cores** — 64-bit application cores: Linux, datacenter, network baseband
7 Series — **Highest performance:** 8-stage, dual-issue superscalar pipeline	**E7 Series** **E76-MC** — Compare to Cortex-M7 Quad-core 32-bit embedded processor **E76** — Compare to Cortex-M7 High performance 32-bit embedded core	**S7 Series** **S76-MC** — No 64-bit Cortex equivalent Quad-core 64-bit embedded processor **S76** — No 64-bit Cortex equivalent High-performance 64-bit embedded core	**U7 Series** **U74-MC** — Compare to Cortex-A55 MP4 Multicore four U74 cores and one S76 core **U74** — Compare to Cortex-A55 High performance LInux-capable processor
3/5 Series — **Efficient performance:** 5–6-stage, single-issue pipeline	**E3 Series** **E34** — Compare to Cortex-R5F E31 features + single-precision floating point **E31** — Compare to Cortex-R5 Balanced performance and efficiency	**S5 Series** **S54** — No 64-bit Cortex equivalent S51 features + single-precision floating point **S51** — No 64-bit Cortex equivalent Low-power 64-bit MCU core	**U5 Series** **U54-MC** — Compare to Cortex-A53 Multicore application processor with four U54 cores and one S76 core **U54** — Compare to Cortex-A53 Linux-capable application processor
2 Series — **Power & area optimized:** 2–3-stage, single-issue pipeline	**E2 Series** **E24** — Compare to Cortex-M4F E21 + single-precision floating point **E21** — Compare to Cortex-M4 E20 + User Mode, Atomics, Multiply, TIM **E20** — Compare to Cortex-M0+ Our smallest, most efficient core	**S2 Series** **S21** — No 64-bit Cortex equivalent Area-efficient 64-bit MCU core	

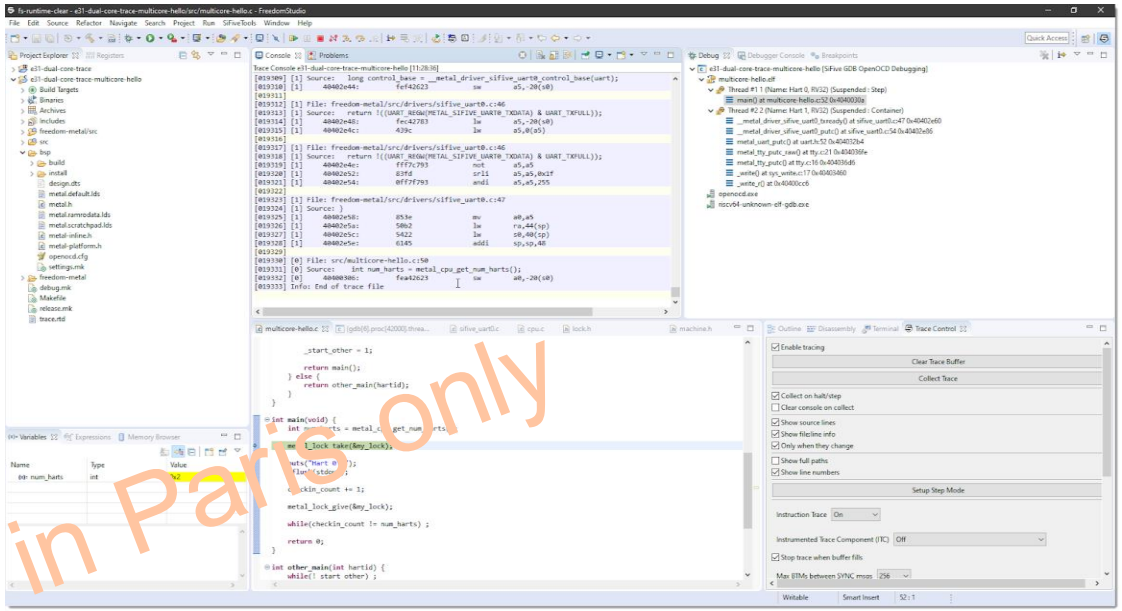
SiFive Cloud Services

- SiFive Core Designer
- Click to configure a RISC-V Core!
- RTL download in 24hrs!
- Core IP configured to your needs!



Quarterly updates

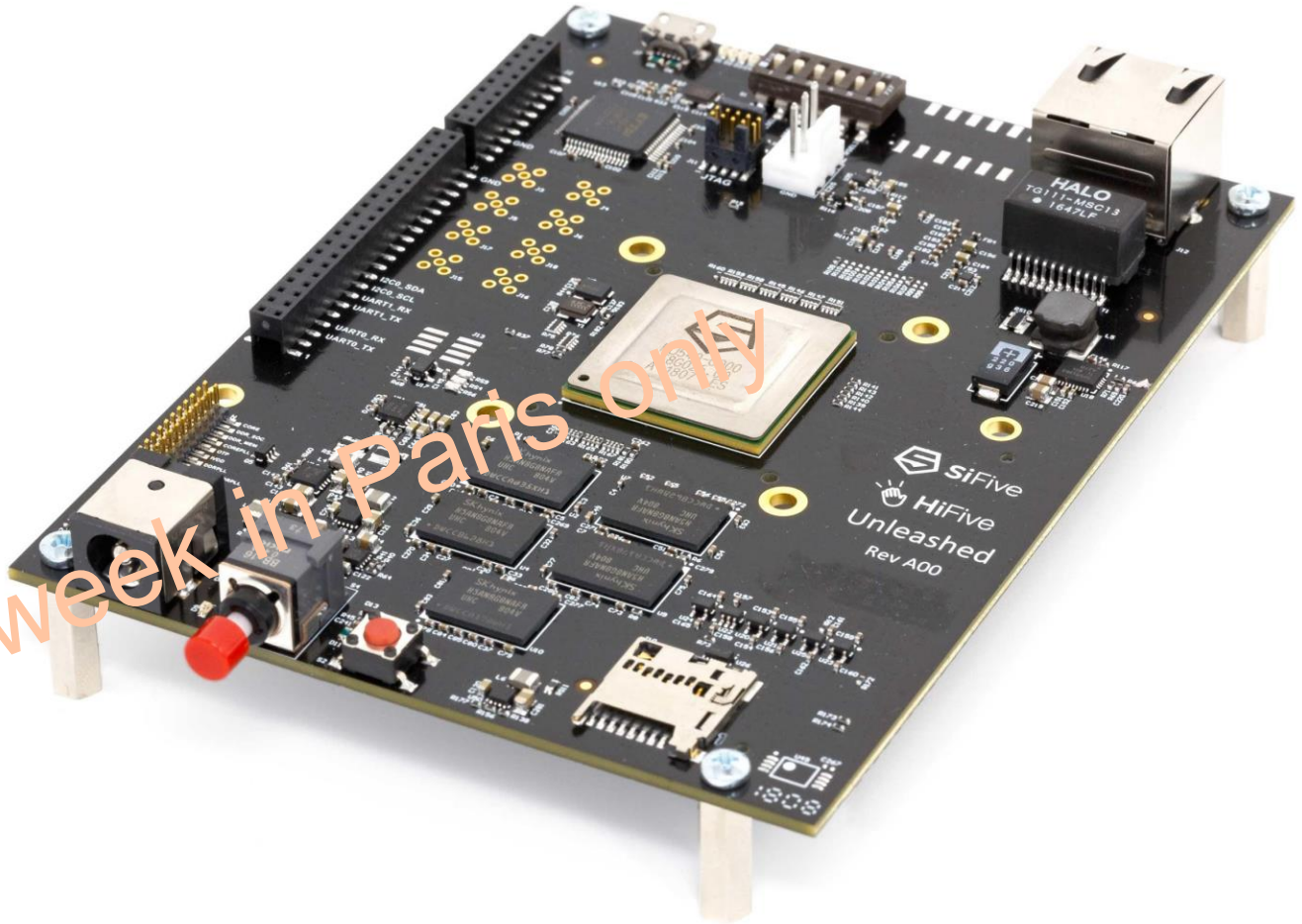
- SiFive delivers IP and product updates on a quarterly basis
- Q3 Update includes Nexus 5001 trace encoders
- SiFive Freedom Studio support
- Open Source RISC-V Trace Decoder now on github



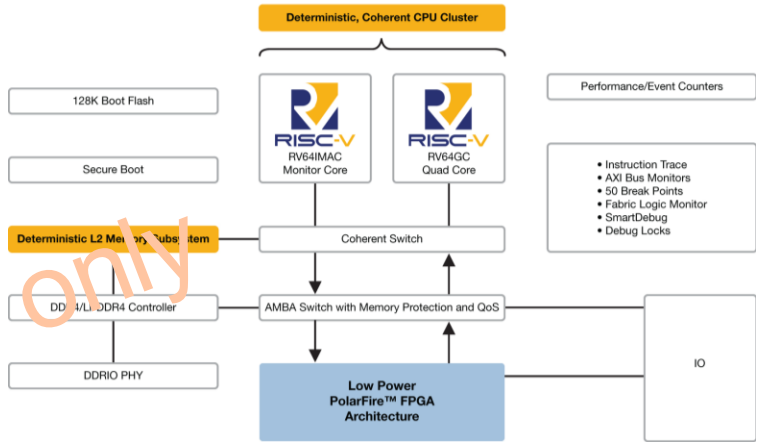
SiFive Freedom Studio

Learn More - SIFIVE.COM

- HiFive Unleashed
  - Quad Core Linux Capable CPU
  - Available via CrowdSupply
- SiFive World Tour
  - 50-City Tour
  - SiFiveTechSymposium.com



SiFive Commercial Success



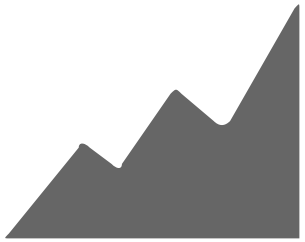
FADU

Microsemi
a MICROCHIP company

SoC security best practices

- Avoid fragmented security solutions
- Get rid of legacy security
- Get a Root-of-Trust
- Improve auditability

RISC-V SoC needs more security



Scalable architecture

Enhanced isolation

Finer grained controls

System level security

Silicon At The Speed Of Software

Linley Fall Processor Conference 2019

Santa Clara, CA., USA

October 23rd & 24th

Join SiFive CTO, Yunsup Lee, and Security Director, Dany Nativel, for the latest innovations and updates on SiFive architectures!