RISC-V goes mainstream – next steps for the ecosystem

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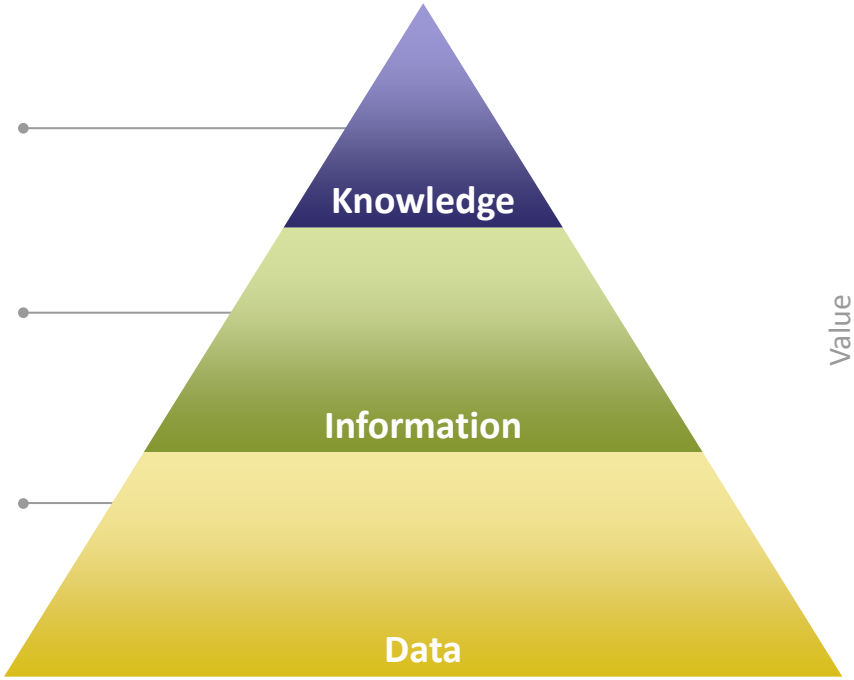
UltraSoC: actionable analytics from any SoC

UltraSoC delivers actionable *insights*

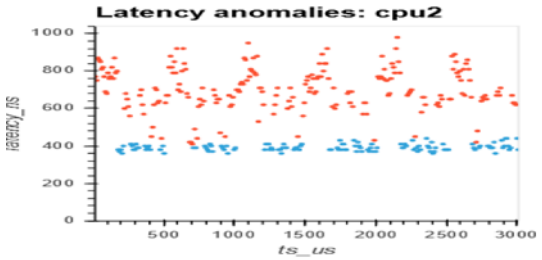
With system-wide *understanding*

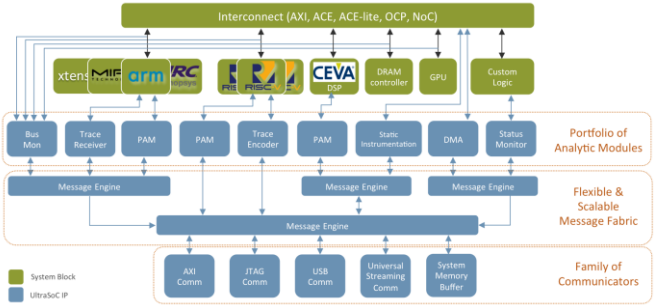
From rich *data* across the whole SoC



UltraSoC enables *full* visibility of SoC

Value



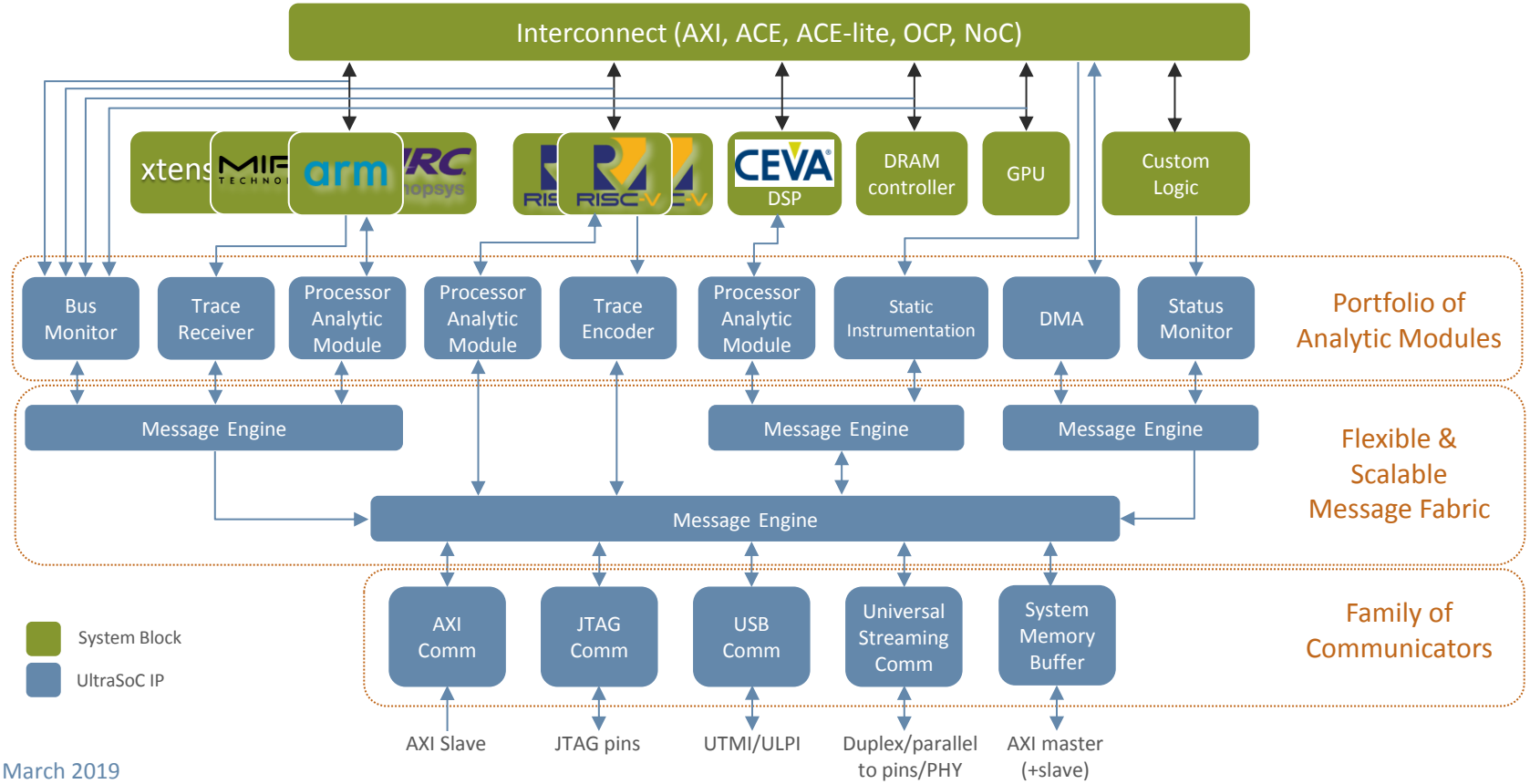


- UltraSoC is “processor agnostic”
  - We’ve always supported ANY processor architecture
- Foundation member since 2016
- June ‘17: first, still only, commercial CPU trace solution
- Chair of the trace group, member/contributor debug group
- Partners include Andes, Esperanto, Lauterbach, Microchip, SiFive, Western Digital

RISC-V trajectory

- At first it was ‘about the ISA’
- Then it was ‘about core design’
- Then it was ‘about real hardware’’
- Foundation membership has doubled in the last year
- Today it’s about:
  - A compelling commercial case
  - An easy technical coexistence – managing complexity

Advanced debug/monitoring for the whole SoC



Ecosystem requirements

- Need a true heterogeneous tool chain
  - RISC-V is entering an era of coexistence
  - Need one cockpit for the different cores in a system
- Both commercial and open-source tools have their place
  - Believe it or not, some engineers prefer commercial tools!!
  - This is especially true for debugging tools
- Specs need to freeze AND evolve
  - People need both certainty and a roadmap
- Security, functionally safe operation
  - Other architectures have these “hygiene factors” built-in

Software tools for heterogeneous designs

Eclipse based UltraDevelop 2 IDE

Control

Multiple CPUs

Configuration

Single step & breakpoint CPU code

SW & HW in one tool

Real-time HW Data

Instruction trace

Third Party Tool Vendor Partnerships

arm
cadence
CEVA
Green Hills SOFTWARE
eclipse
IMG Systems
imperas
LAUTERBACH DEVELOPMENT TOOLS
Mentor A Siemens Business
percepio
SYNOPSYS
TELEDYNE LECROY Everywhereyoulook

Commercial considerations – the dream

- Commercial benefits of open source are well versed
  - Vendor lock-in is harder – drives down prices
  - Motivates adoption and investment – diversity of choice for users
  - Barriers to entry are lower
- The current market dominance suits no-one except the incumbent CPU suppliers
  - Licensing / royalty models are changing in front of our eyes

Commercial considerations – the reality

- An OEM won't up-end its approved supplier list overnight
- When customers buy chips, they buy more than an architecture
  - Supply chain, tech support, etc etc etc
  - The impact of late or off-spec delivery is massive
- Today's tech industry sets astonishingly high standards
  - The idea that "anyone can do it" is fanciful in many commercial environments

Great ideas are nothing without execution

Ideas are just a multiplier of execution

It's so funny when I hear people being so protective of ideas. (People who want me to sign an NDA to tell me the simplest idea.) To me, ideas are worth nothing unless executed. They are just a multiplier. Execution is worth millions:

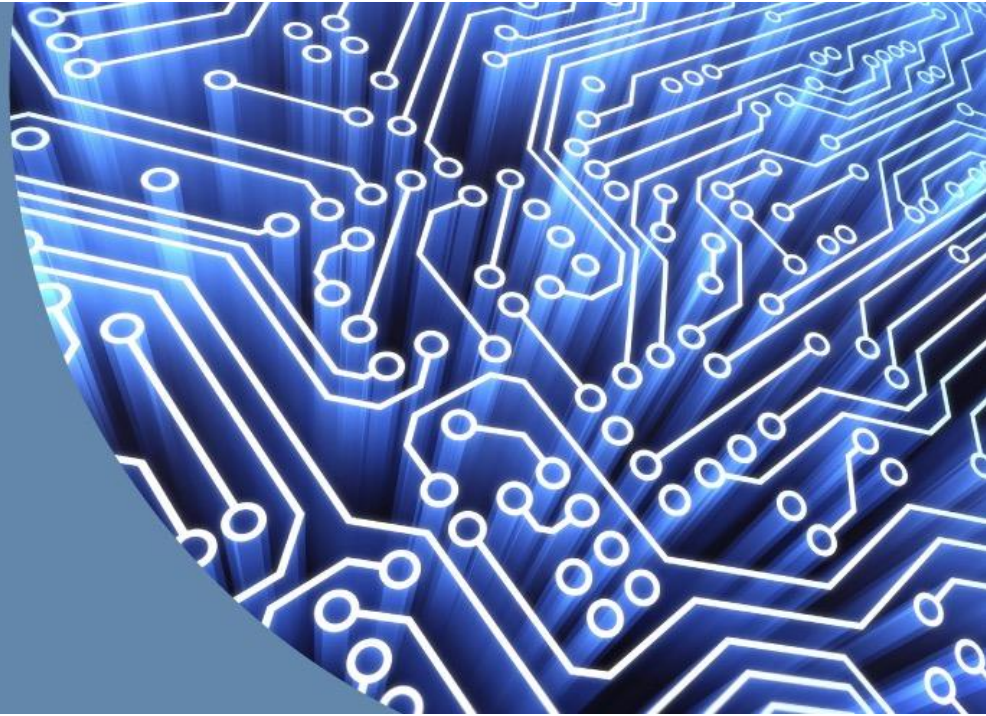
Awful idea =	-1	No execution =	$1
Weak idea =	1	Weak execution =	$1,000
So-so idea =	5	So-so execution =	$10,000
Good idea =	10	Good execution =	$100,000
Great idea =	15	Great execution =	$1,000,000
Brilliant idea =	20	Brilliant execution =	$10,000,000

To make a business, you need to multiply the two.
The most brilliant idea, with no execution, is worth $20.
The most brilliant idea takes great execution to be worth $20,000,000.
That's why I don't want to hear people's ideas.
I'm not interested until I see their execution.

Derek Sivers (sivers.org)
Originally posted on Oreillynet.com, August 16, 2005

Summary

- RISC-V has come a long way
- It's now about commercial execution more than ideas
- RISC-V will be used alongside other architectures for the foreseeable future: the RISC-V ecosystem needs to embrace that fact
  - Foster both open source AND commercial tools
  - Give architects and designers what they need

Contact details:

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