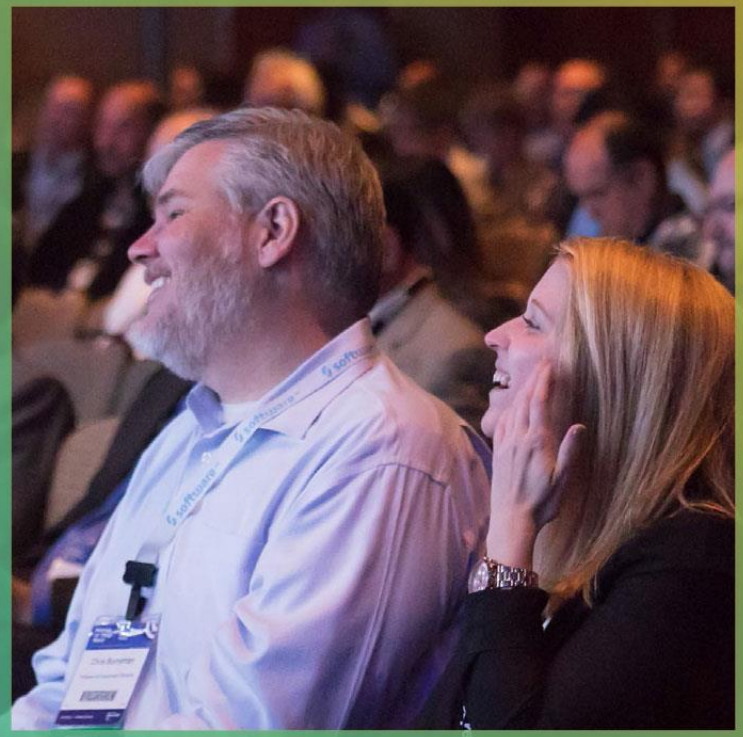
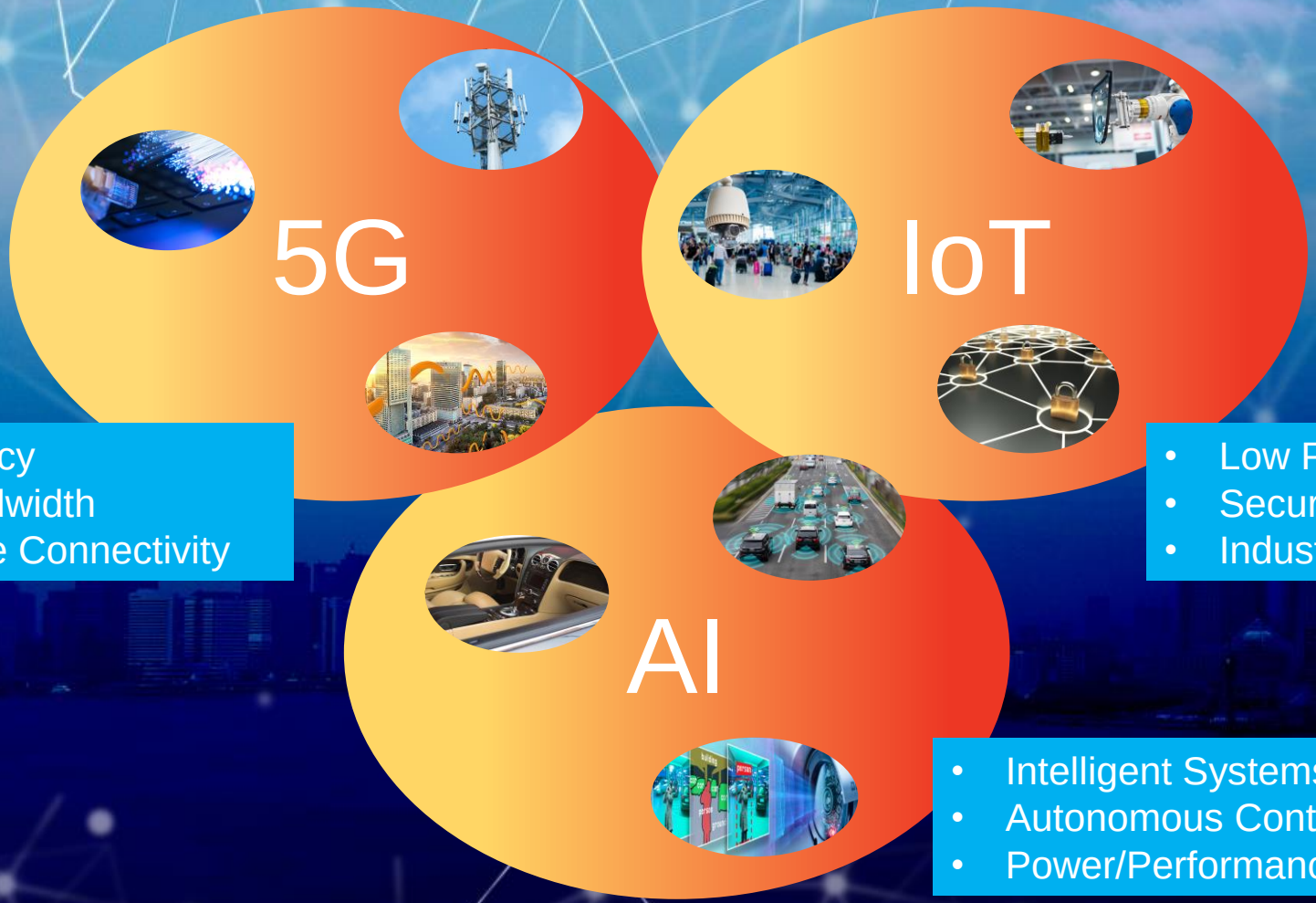
RISC-V Summit

# ENABLING THE FREEDOM TO INNOVATE



**Patrick Johnson**
Vice President, Mixed Signal & FPGA Business Units
**Microchip**

# Massive need for innovation ahead at the edge




- Energy Efficiency
- Ultra-high Bandwidth
- Massive Device Connectivity

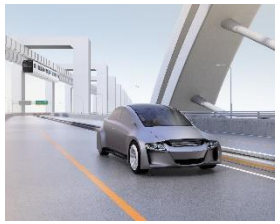
- Low Power
- Security and Reliability
- Industrial & Commercial

- Intelligent Systems
- Autonomous Control
- Power/Performance Optimized

# Challenging requirements

Low Power

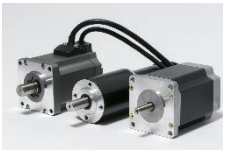
Autonomous Vehicles



Gateways

A&D

Industry 4.0



Cloud Compute Farms

Reliability

Security

Massive Acceleration at the Edge

Edge Computing in Gateways & IoT Apps

Massive Data Acceleration

Determinism

# Innovation happens in environments where people and ideas are free to connect …


## …. and with innovation, comes progress.

# Freedom to Innovate with RISC-V

**Jul 2015**

Microsemi Attends 2nd RISC-V Workshop

# Freedom to Innovate with RISC-V

**Jul 2015**

**Sep 2015**

Microsemi Joins the RISC-V Foundation as a Platinum Member

*Platinum Founding Sponsors*

bluespec

DRAPER

Microsemi

Google

Hewlett Packard Labs

ORACLE

SiFive

*Gold & Silver Founding Sponsors*

antmicro

codasip

GRAY RESEARCH

LATTICE SEMICONDUCTOR

lowRISC

Roa Logic

Rumble Development

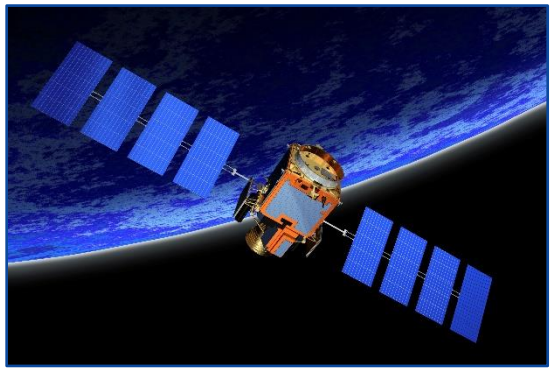
Syntacore™ Custom cores and tools

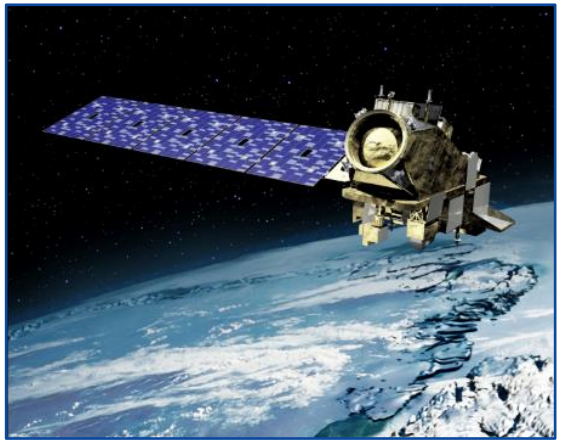
Technolution

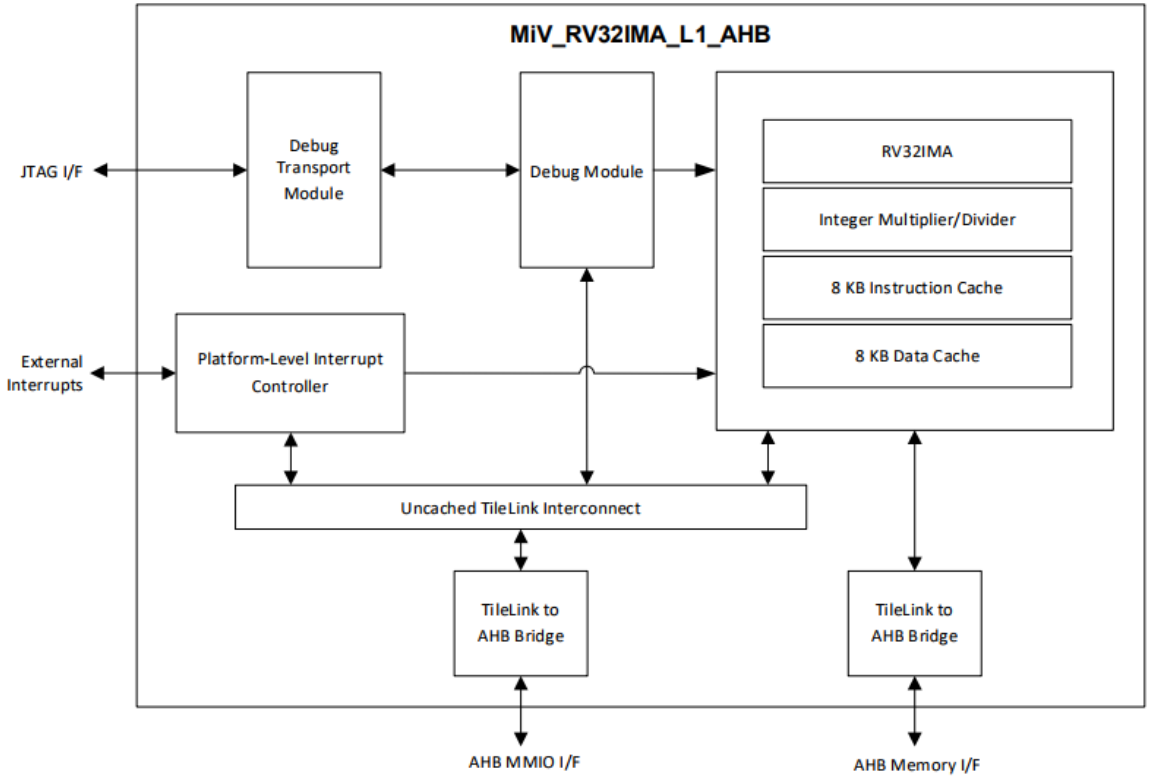
# Freedom to Innovate with RISC-V

Jul 2015 → Sep 2015 → Mar 2016

Microsemi Partners with SiFive to create a Soft RISC-V CPU in 3 months





# Freedom to Innovate with RISC-V

Jul 2015 → Sep 2015 → Mar 2016 → **May 2016**

Microsemi enables the world's 1st RISC-V volume commercial shipment on our IGLOO2 Low Power FPGA Platform

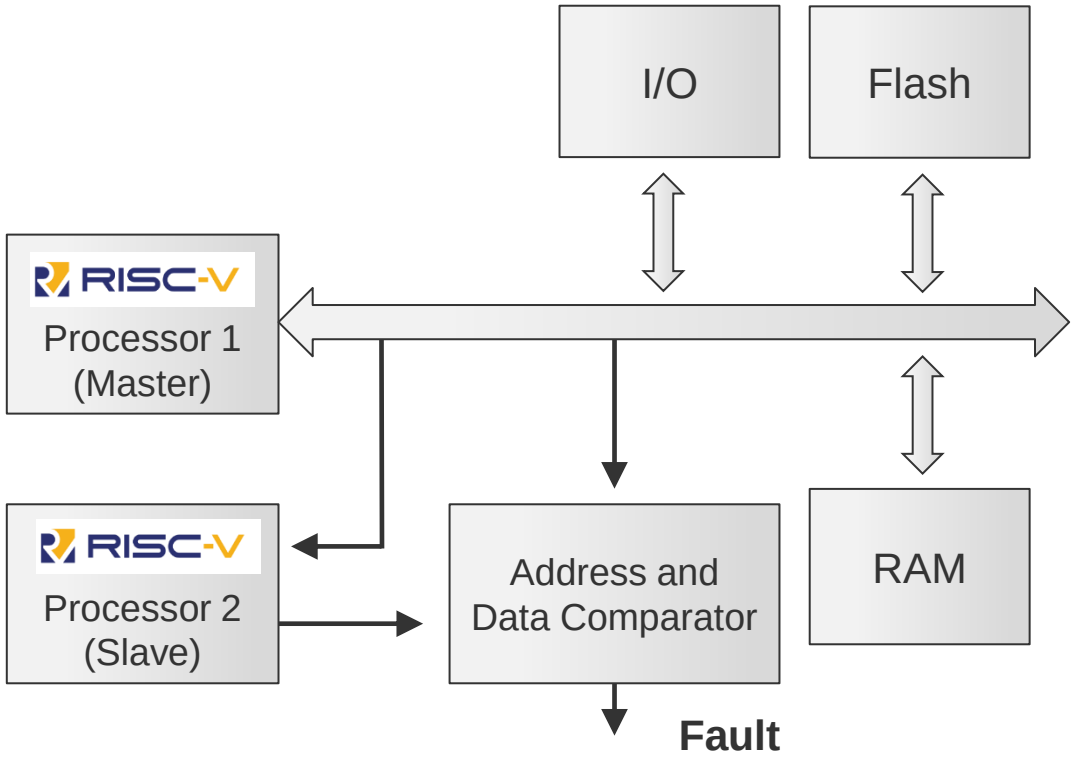
Microsemi Power Matters.
IGLOO®2 FPGA

RISC-V

# Freedom to Innovate with RISC-V

Jul 2015 | Sep 2015 | Mar 2016 | May 2016 | **May 2017**

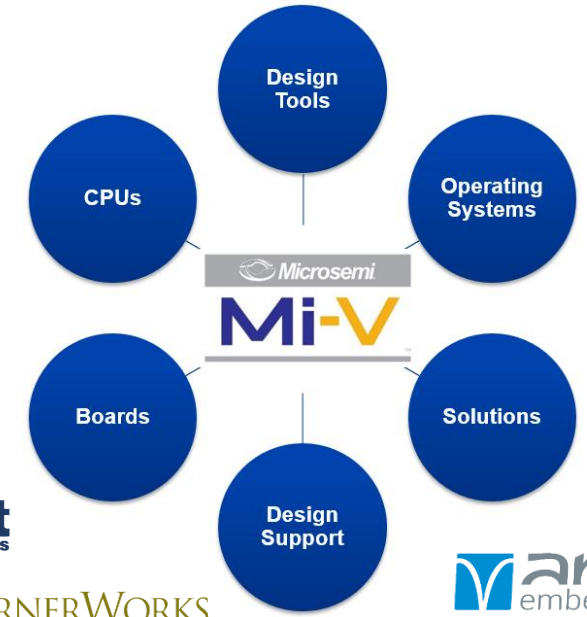
Microsemi demonstrates dual lock step RISC-V CPUs on our high reliability FPGA platforms



# Freedom to Innovate with RISC-V

Jul 2015 → Sep 2015 → Mar 2016 → May 2016 → May 2017 → Dec 2017

Microsemi creates the Mi-V ecosystem to enable adoption of RISC-V CPUs across our FPGA platforms




antmicro
imperas
SiFive
ultraSoC
Libero System-on-Chip
SoftConsole
µC/OS The Real-Time Operating System
freeRTOS
APACHE mynewt
expresslogic

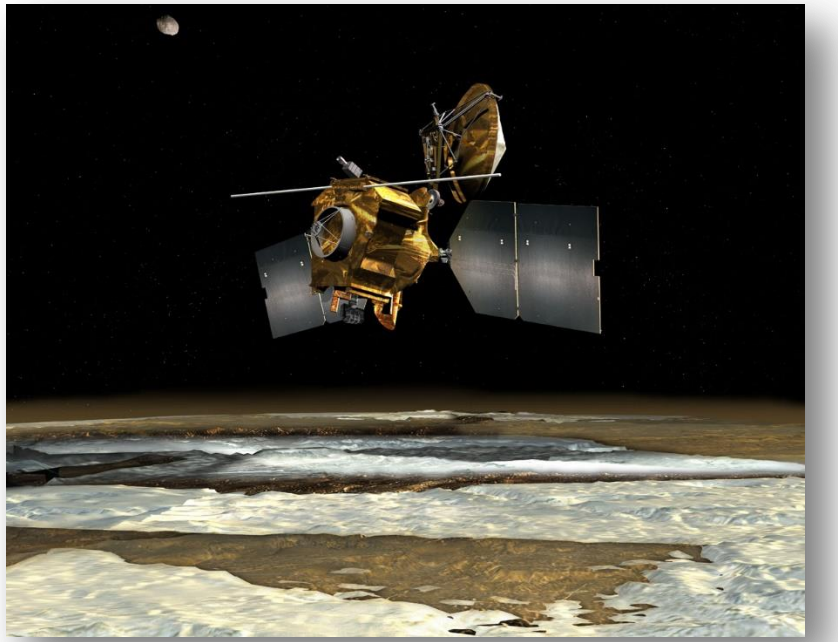

EmCraft systems

DornerWorks
DIGITAL CORE TECHNOLOGIES QUALITY BY DESIGN
PHYTEC
aries embedded Intelligence for Industry
BuildRoot Making Embedded Linux Easy
Zephyr
0x5 HEX-Five

# Freedom to Innovate with RISC-V

Jul 2015 | Sep 2015 | Mar 2016 | May 2016 | May 2017 | Dec 2017 | **Mar 2018**

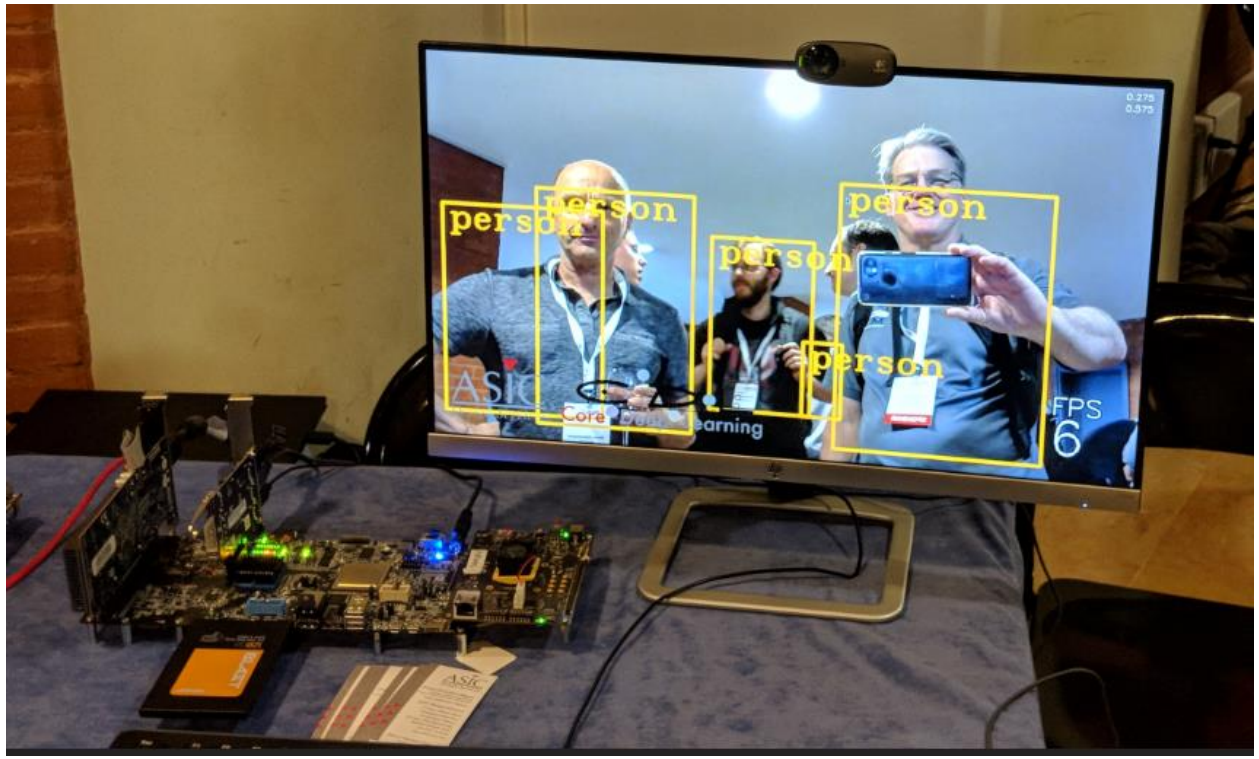
First adoption of RISC-V CPU on Hi-Rel FPGA platform for a space mission



# Freedom to Innovate with RISC-V

Jul 2015 | Sep 2015 | Mar 2016 | May 2016 | May 2017 | Dec 2017 | Mar 2018 | **May 2018**

Microsemi, SiFive, and ASIC Design Services demonstrate Machine Learning on the worlds 1st RISC-V PC



# Freedom to Innovate with RISC-V

Jul 2015 | Sep 2015 | Mar 2016 | May 2016 | May 2017 | Dec 2017 | Mar 2018 | May 2018 | May 2018

Microchip Acquires Microsemi


+



# Freedom to Innovate with RISC-V

Jul 2015 | Sep 2015 | Mar 2016 | May 2016 | May 2017 | Dec 2017 | Mar 2018 | May 2018 | May 2018

Microchip Acquires Microsemi

## Leading Embedded Control Solutions Company

- Microcontrollers, Digital Signal Controllers and Microprocessors
- EEPROM and Flash Memory Solutions
- Mixed-Signal, Analog, Interface and Security solutions
- Clock and Timing Solutions
- Wireless and Wired Connectivity Solutions
- **FPGAs**
- Grown to ~ $6 Billion revenue run rate including Microsemi
- 150ku + clients

MICROCHIP

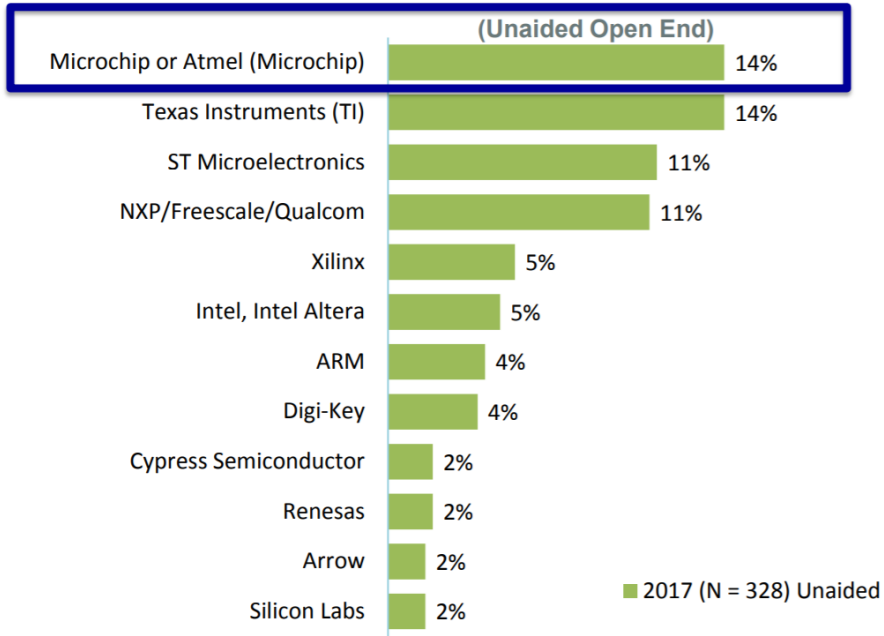
SMART | CONNECTED | SECURE

# Freedom to Innovate with RISC-V

Jul 2015 | Sep 2015 | Mar 2016 | May 2016 | May 2017 | Dec 2017 | Mar 2018 | May 2018 | May 2018

## Which vendor has the best ecosystem for your needs?

ASPENCORE




EETimes embedded 2017 Embedded Markets Study



## Microchip Acquires Microsemi

MICROCHIP

SMART | CONNECTED | SECURE

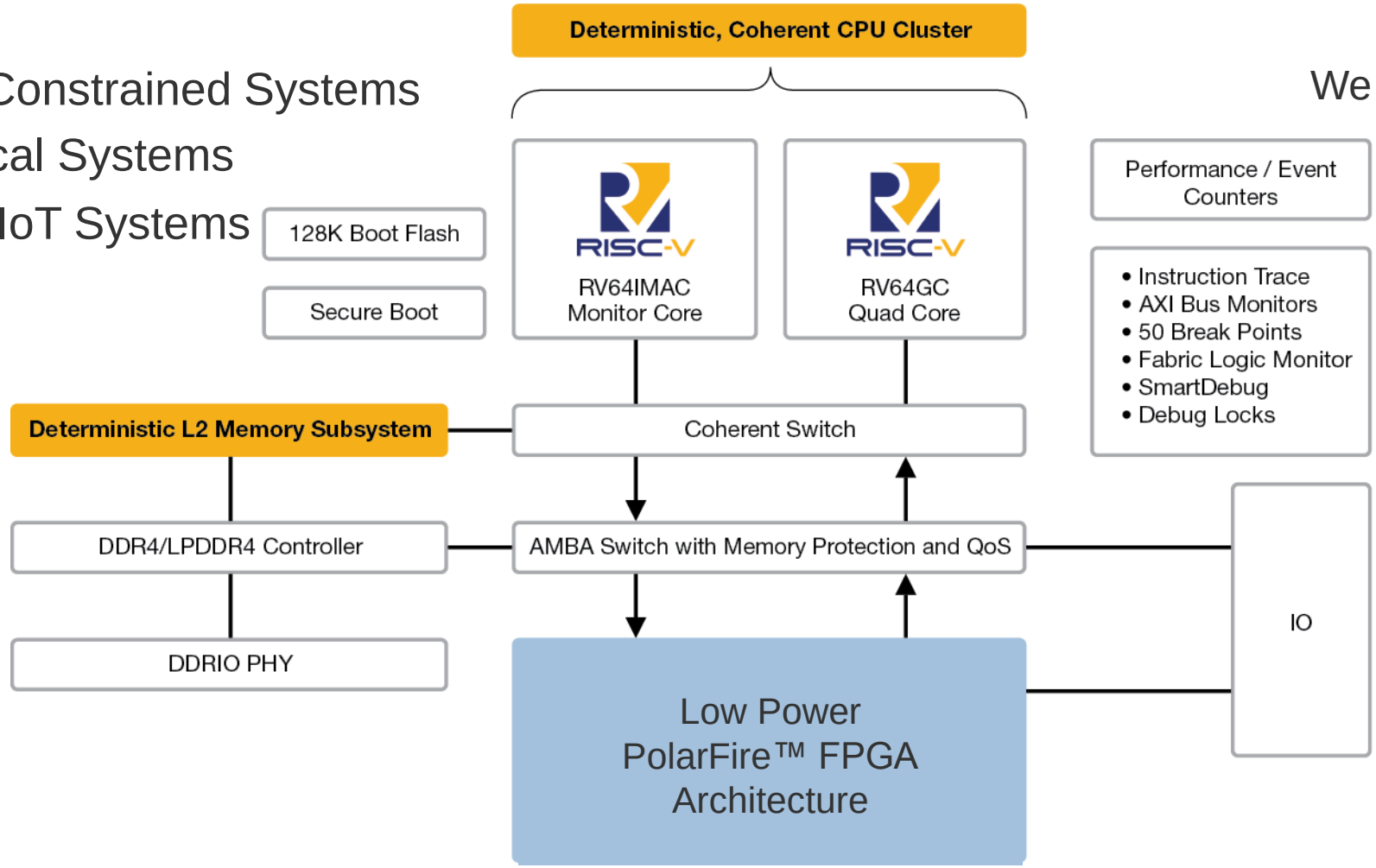
# PolarFire SoC – The World's First RISC-V SoC FPGA Architecture

## Freedom to Innovate in

- Linux and Real-Time
- Thermal and Power Constrained Systems
- High-Rel Safety Critical Systems
- Securely Connected IoT Systems

Dec 2018

We are Here




SiFive

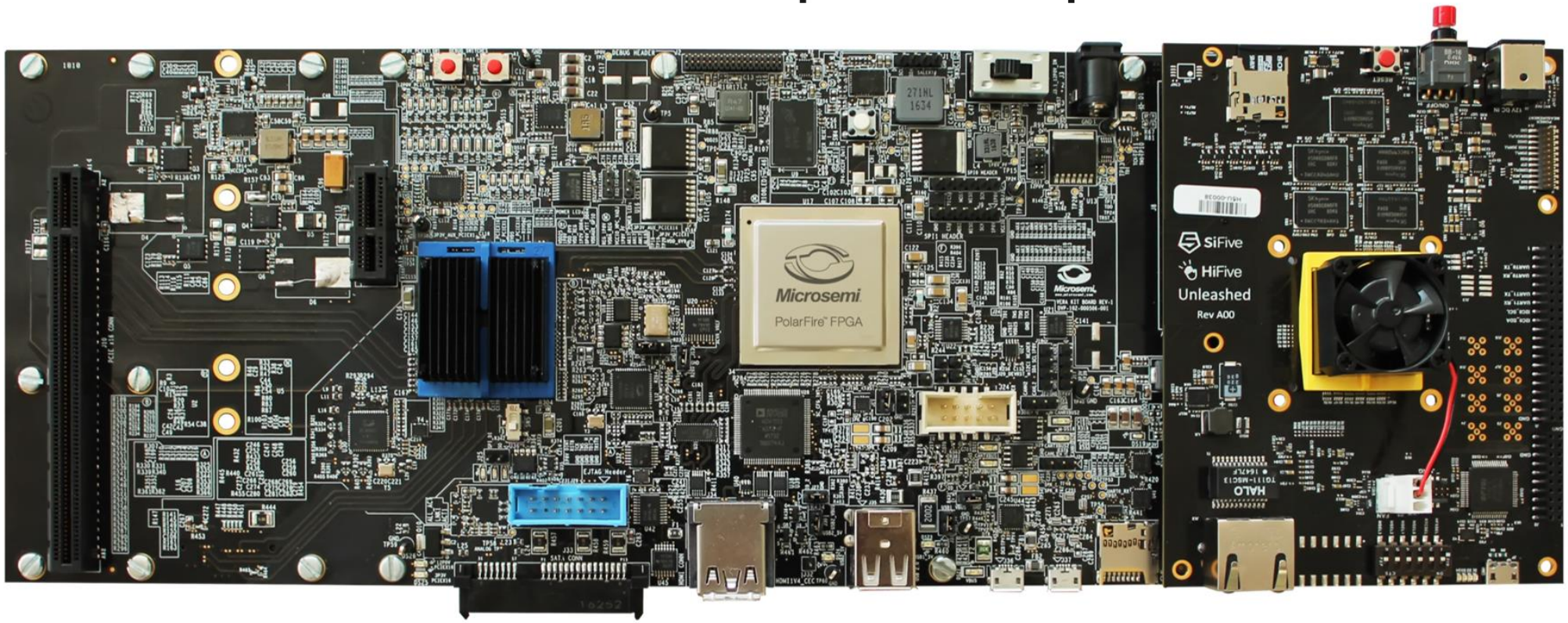
ultraSoC



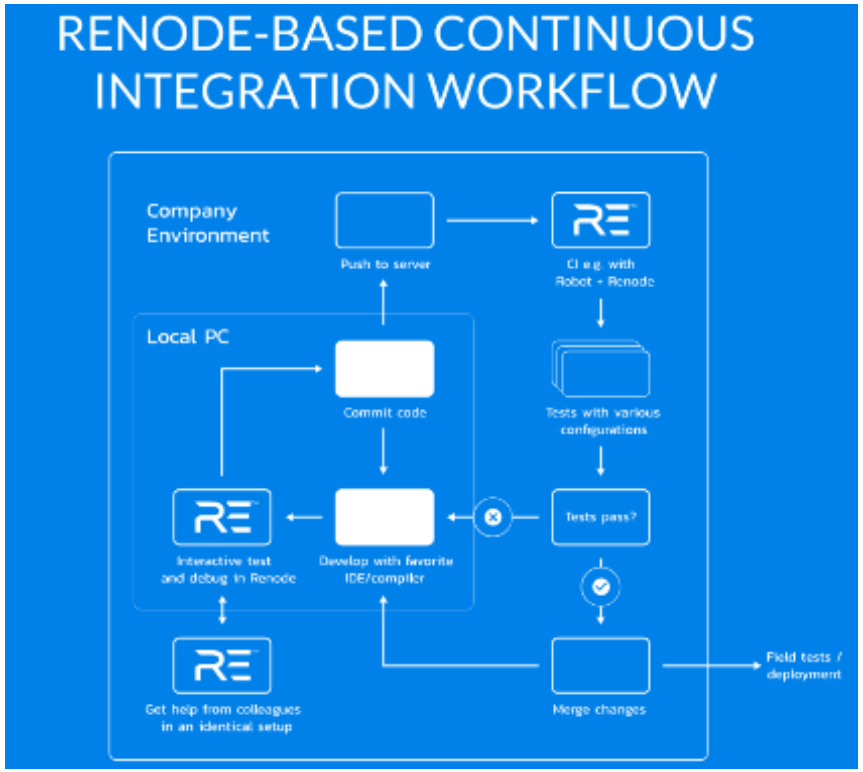
 

# Freedom to begin hardware development

## PolarFire SoC Embedded Experts Development Platform



# Freedom to start software development




RENODE™

- Free Rapid Software Development and Debug Capabilities without Hardware
- Complete PolarFire SoC Processor Subsystem Model

antmicro

# Freedom to engage with the Mi-V ecosystem

## New Mi-V Embedded Experts Network

antmicro

aries embedded
Intelligence for Industry

DIGITAL CORE TECHNOLOGIES
QUALITY BY DESIGN

DORNERWORKS

EmCraft systems

EMDALO TECHNOLOGIES
Embedded Intelligent Systems

PHYTEC

# Learn how we innovated

## RISC-V Multi-Core Secure Boot

**Pierre Selwan & Ken Irving**

System Architects, Microchip
Tuesday @ 4:30pm - 4:50pm

2nd Floor Meeting Rooms 209 / 210

## Deterministic L2 Cache Solution and Performance in an AMP capable SoC

**Cyril Jean**

Director, IP Engineering, Microchip

Tuesday @ 1:10pm - 1:30pm

1st Floor, Exhibit Hall A-1

## Using the RISC-V PMP with an Embedded RTOS to Achieve Process Separation and Isolation

**Jean Labrosse**

Software Architect, Micrium / Silicon Labs

Tuesday @ 2:50pm - 3:10pm

2nd Floor Meeting Rooms 203 / 204

## Making a Complex, Linux-enabled SoC Available to Everyone Today with Renode

**Michael Gielda**

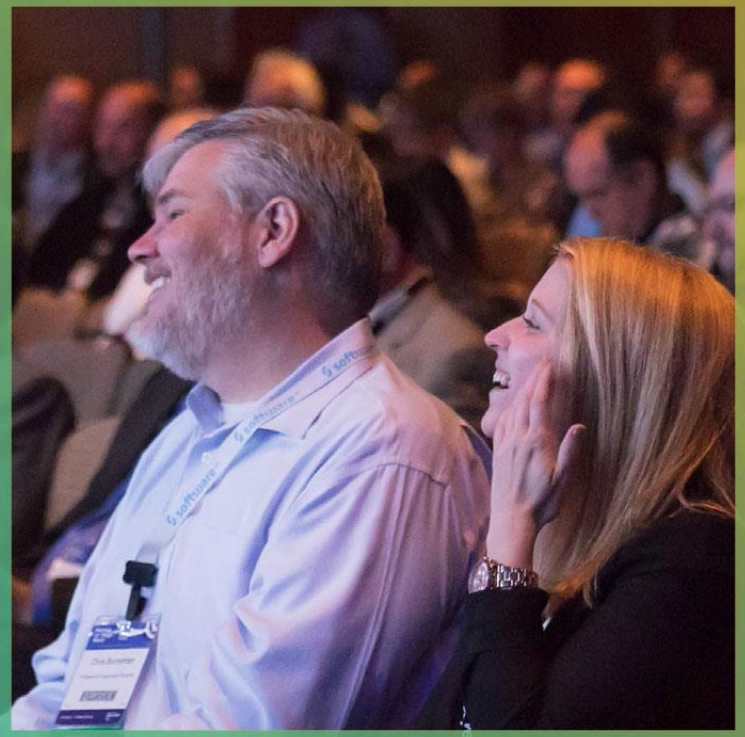
VP Business Development,  antmicro

Tuesday @ 4:30pm - 5:00pm

2nd Floor Meeting Rooms 203 / 204

RISC-V Summit

# THANK YOU



https://tmt.knect365.com/risc-v-summit

@risc_v