

27 February 2025



The CHERI Alliance

Embedding improved security in electronic systems

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lowRISC – Founding Member of the CHERI Alliance



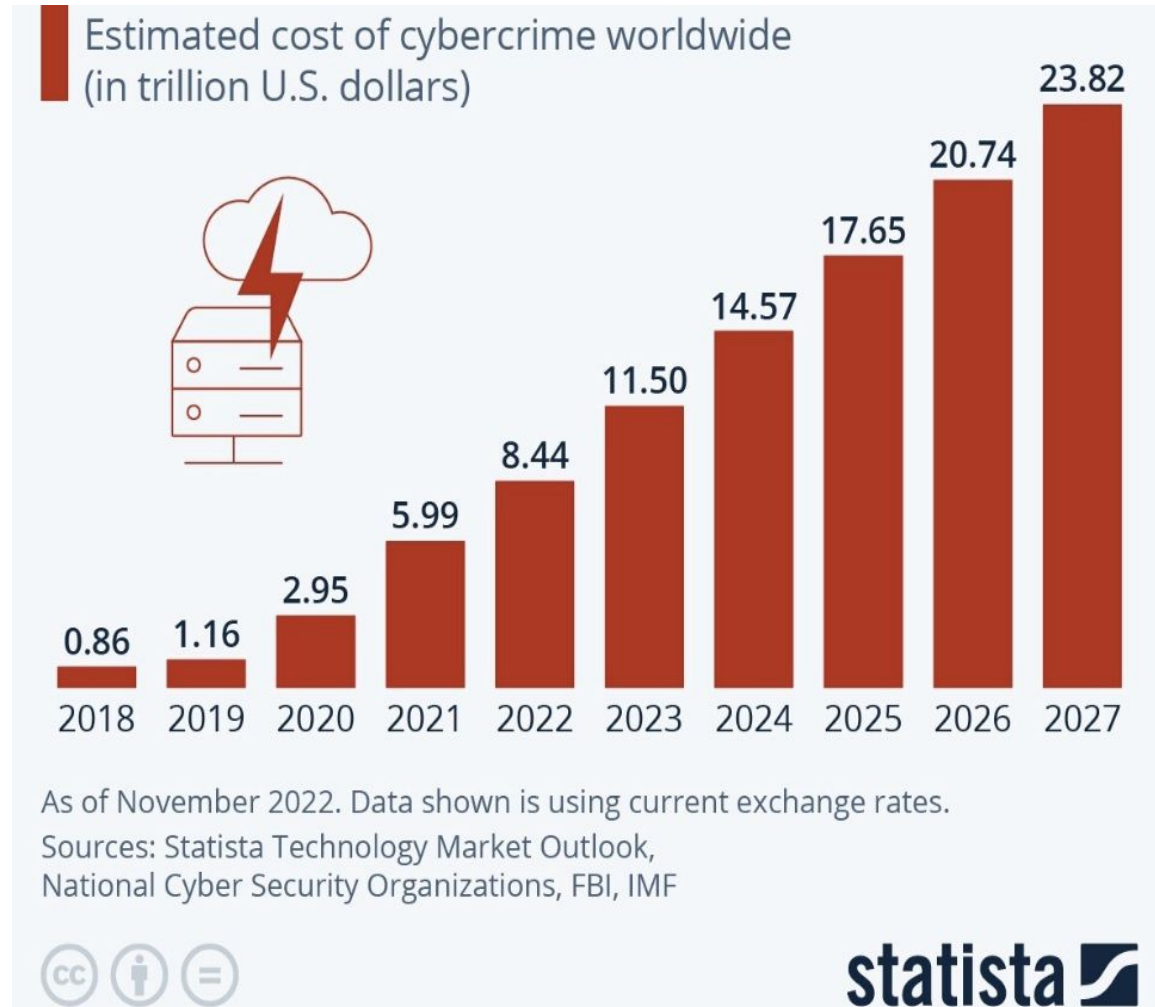
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○ Agenda

- ◆ Memory safety problem
- ◆ CHERI technology
- ◆ CHERI Alliance
- ◆ lowRISC
- ◆ Members benefits

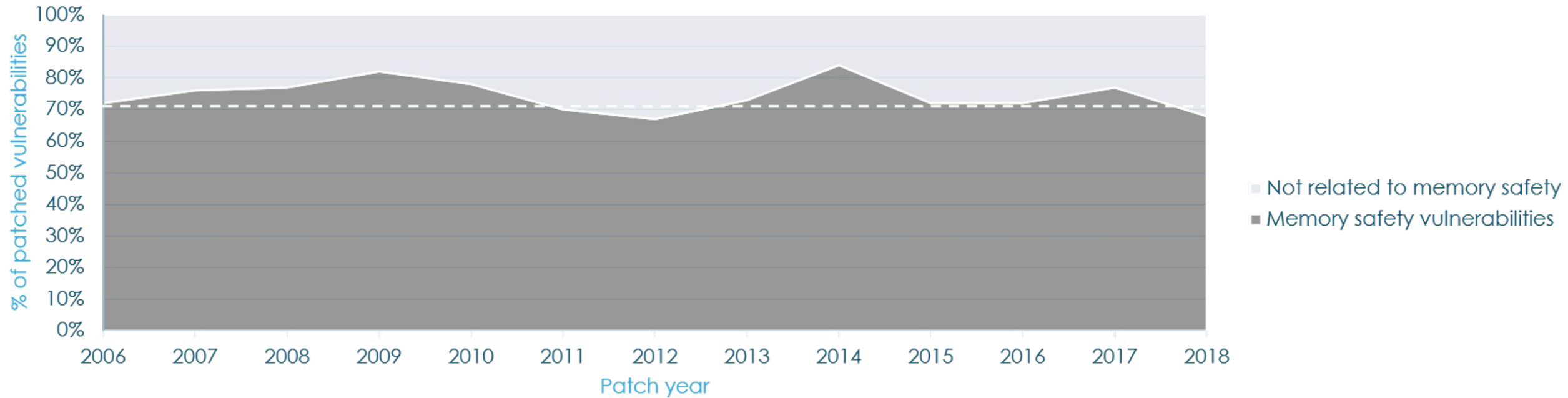
Memory safety problem

○ Software vulnerabilities are causing increasing risk



○ Problem: lack of memory safety

- ◆ Memory abuse is the main attack vector
- ◆ Constant ratio of over the past 20 years



○ Possible solutions for memory safety

- ✗ Use “memory safe” languages like Rust or .Net
 - Requires rewriting trillions of lines of C/C++ code
 - Possible for new code, but no compartmentalisation
- ✗ Use “coarse-grained” techniques like stack “canaries”
 - Helpful, but they statistically leave too many holes
 - Hacking techniques already developed
- ✓ Use “fine-grained” techniques like CHERI
 - Best option, but needs new hardware

CHERI technology

C apability
H ardware
E nhanced
R ISC
I nstructions

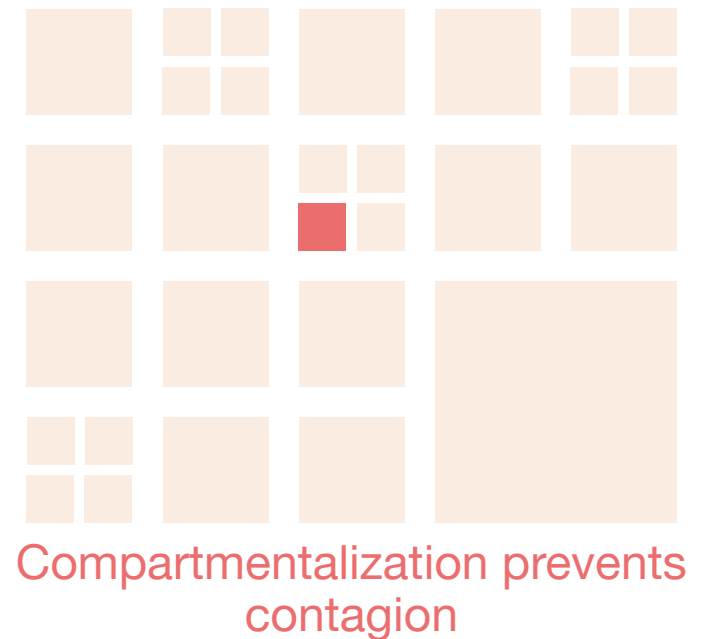
○ CHERI

◆ Benefits

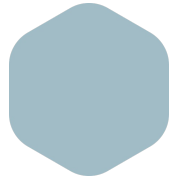
- ◆ Deterministic, fine-grained **memory protection**
- ◆ Scalable **compartmentalization**

◆ An architectural solution

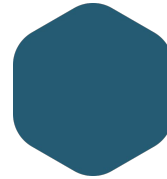
- ◆ Works with existing software
- ◆ Protects software with hardware
- ◆ Extension of conventional hardware ISAs



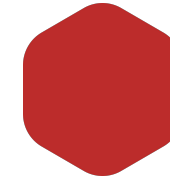
○ CHERI origins



- ◆ Initiated by a project from



- ◆ Originally developed by



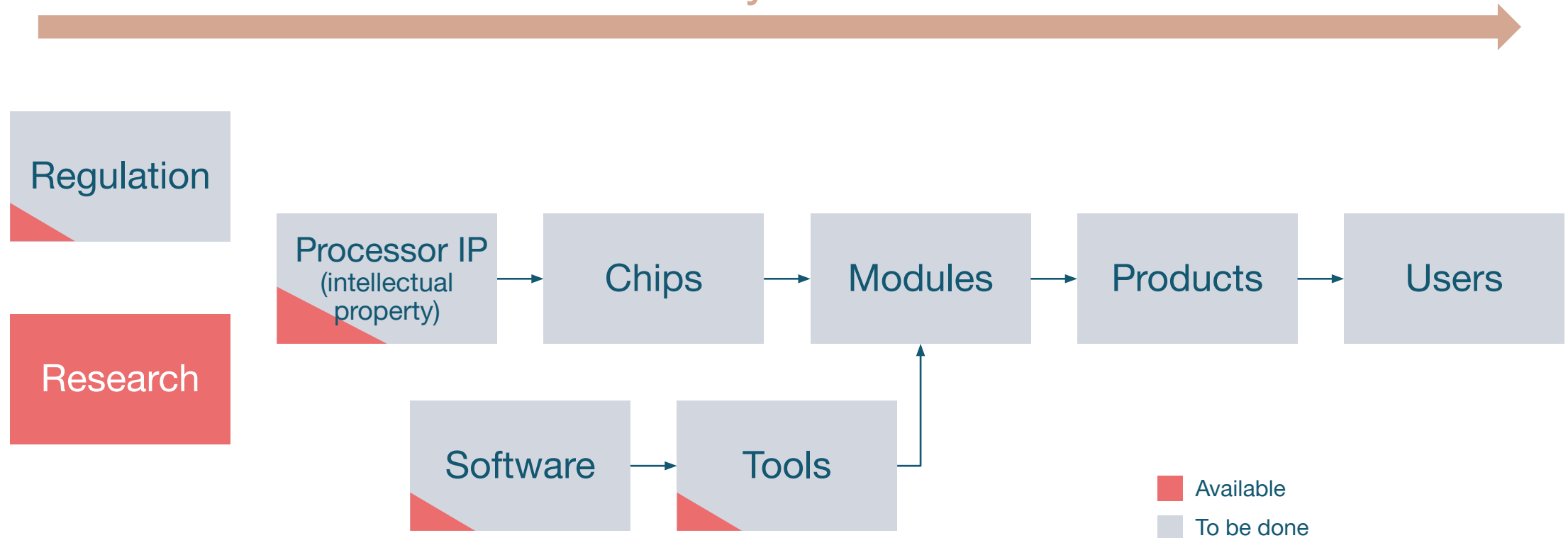
- ◆ Matured for 14 years

- ◆ Supported by



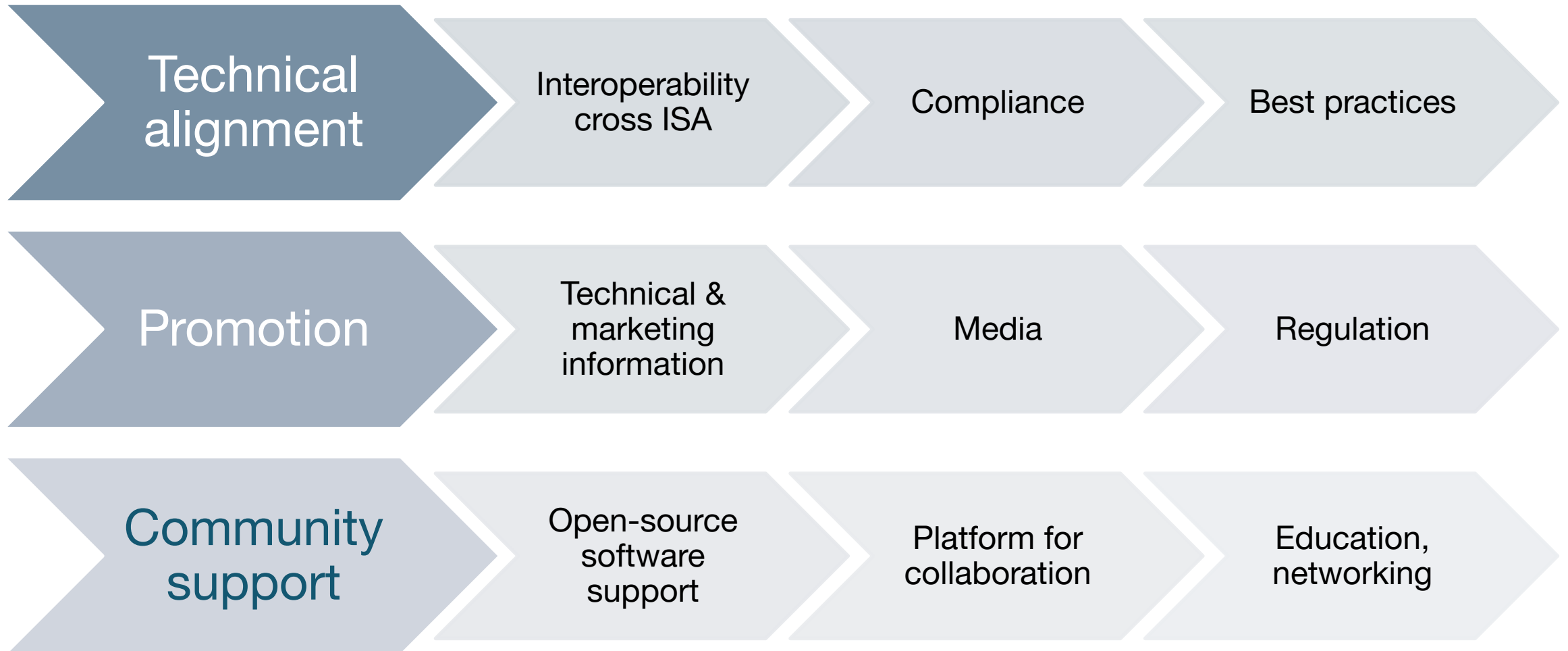
Getting CHERI adopted

Stimulate the industry!



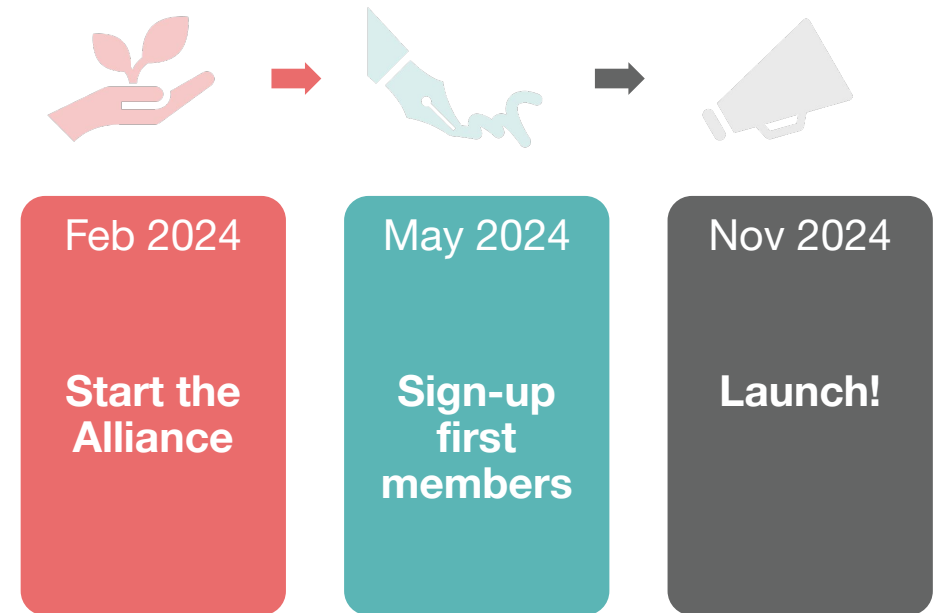
The CHERI Alliance

○ Role of the CHERI Alliance



○ An independent entity

- ISA-agnostic
 - CHERI could be added to Arm, x86, MIPS, RISC-V, ...
- Worldwide reach
- Not just one company
 - Need broad industry adoption
 - Need a community
- Financed by the industry*



○ Founding members of the CHERI Alliance



UNIVERSITY OF
BIRMINGHAM



UNIVERSITY OF
CAMBRIDGE

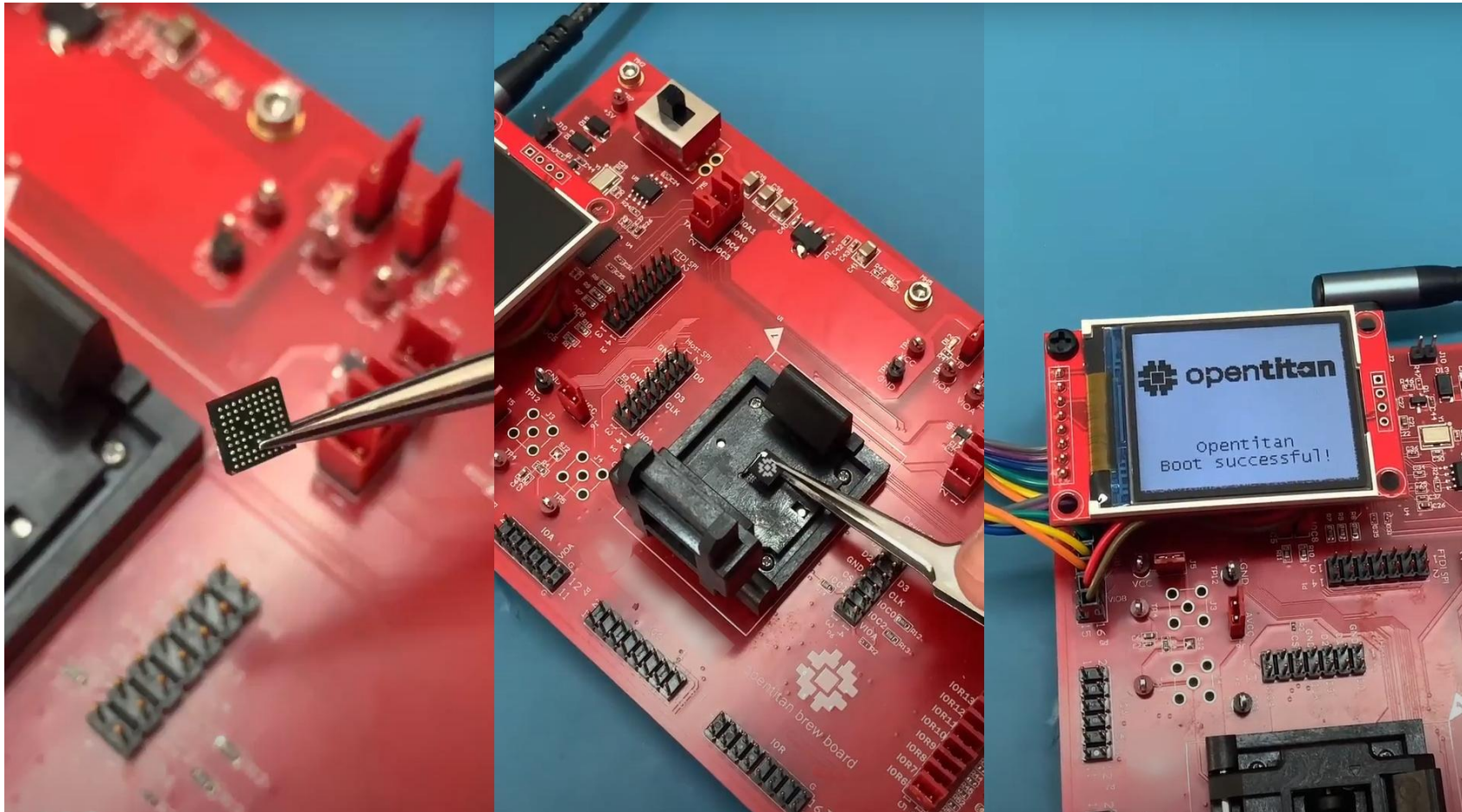


University
of Glasgow



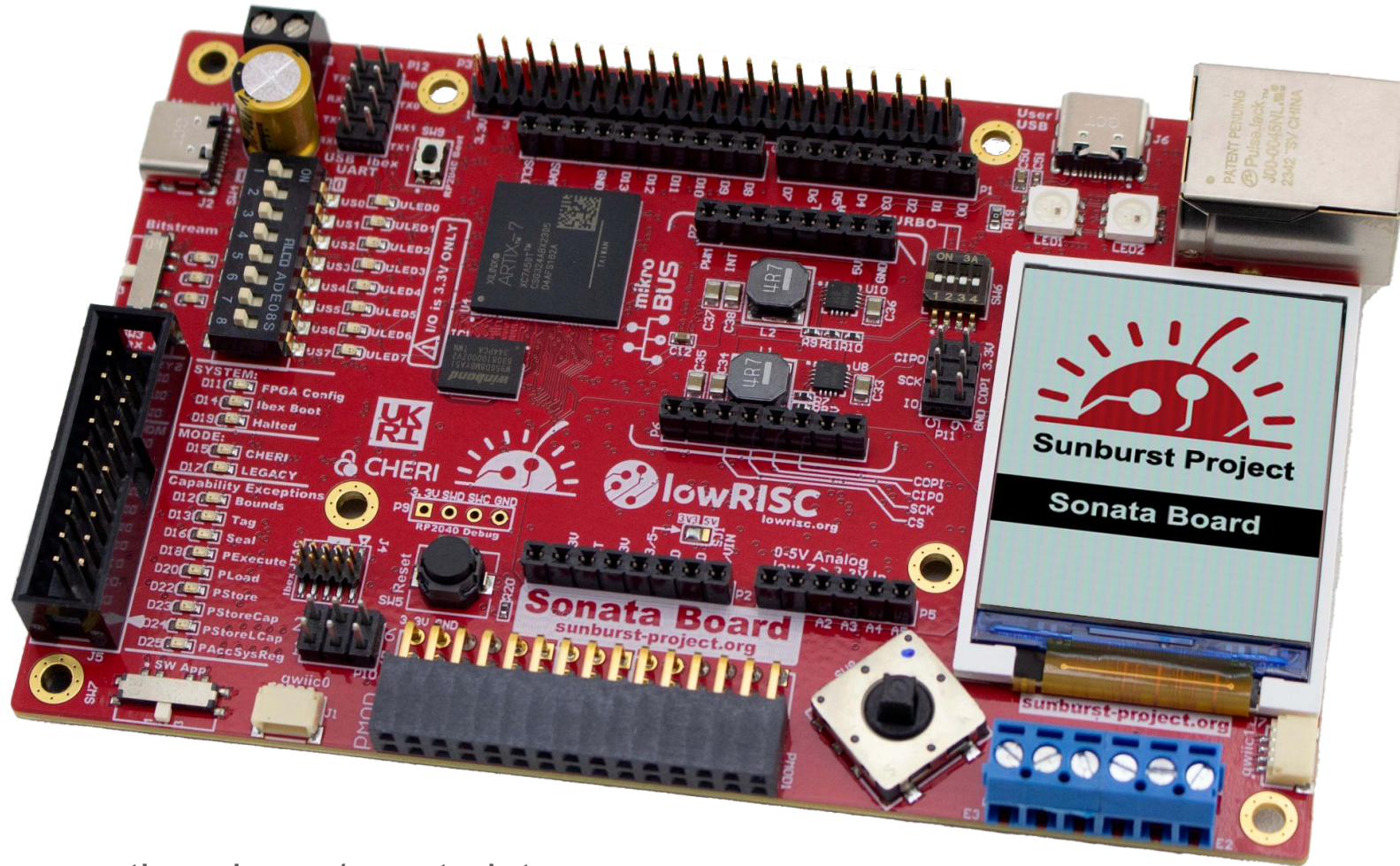
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○ 1st Commercial-Grade Open Source Chip



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○ Sonata: CHERIoT development platform



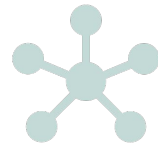
tinyurl.com/sonata-int

Members benefits

CHERI Alliance members benefits



Demonstrate security leadership



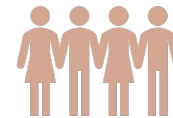
Network, collaborate and exchange



Accelerate adoption of CHERI



Share promotion costs



Activate the community





CHERI

ありがとうございます

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