BARCELONA **ZETTASCALE** LAB

Hacia el Zettascale: Avances del Barcelona Zettascale Lab

Evento Final del proyecto BZL Madrid (España)
16 de Junio de 2026

Barcelona Supercomputing Center
Centro Nacional de Supercomputación

BARCELONA ZETTASCALE LAB

Avances en la Arquitectura de Computadores de BZL

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Barcelona Supercomputing Center
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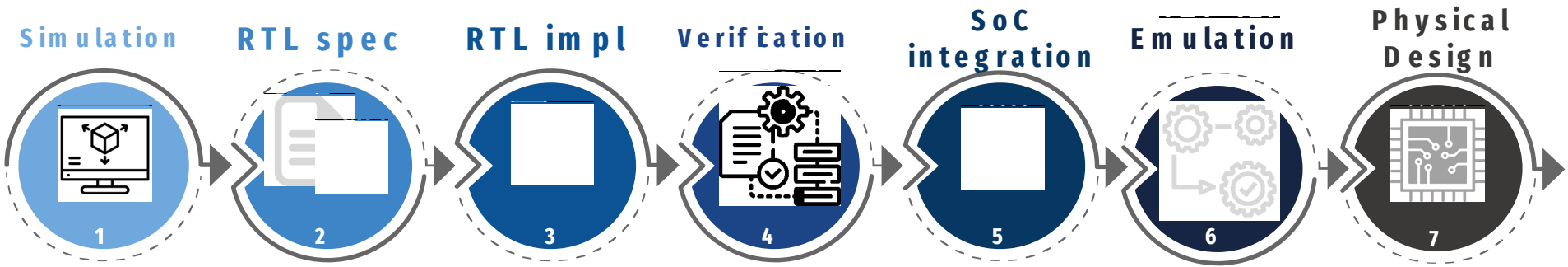
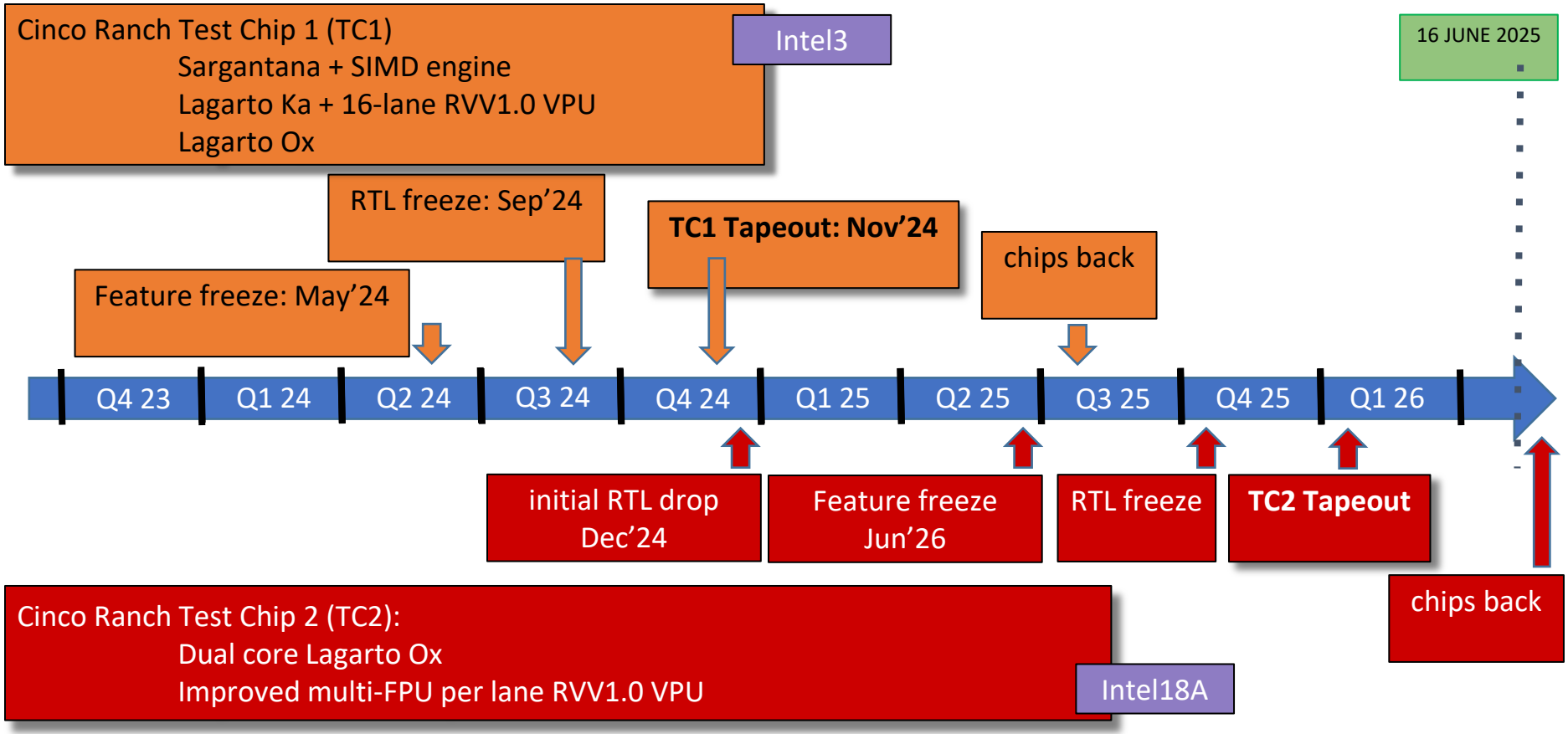
BZL Chip Design Organization



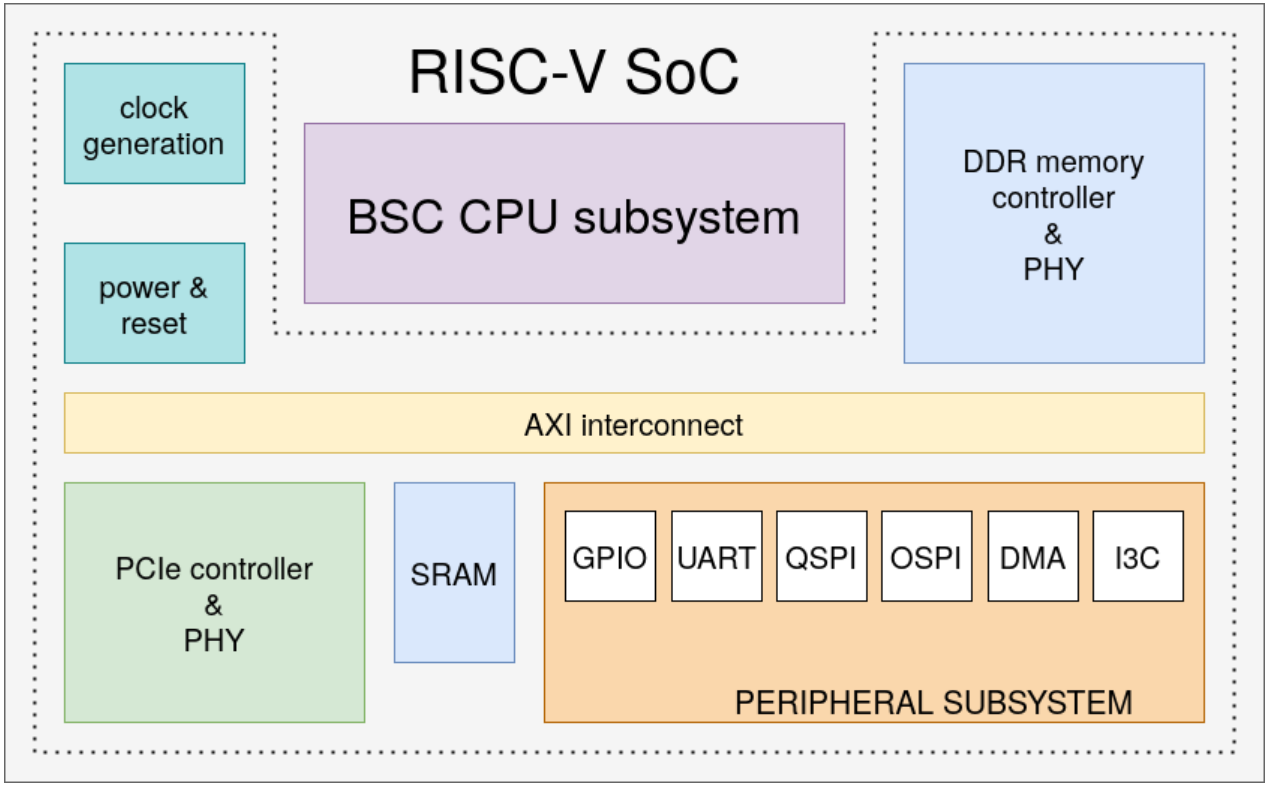
- Create new engineering teams specialized in the different stages of a chip design
- Incorporate industry best practices in the chip design methodoloy at BSC (Intel and other collaborators in European projects)
- Automation (DevOps) and periodic quality assesment reviews

BZL Tapeouts Timeline

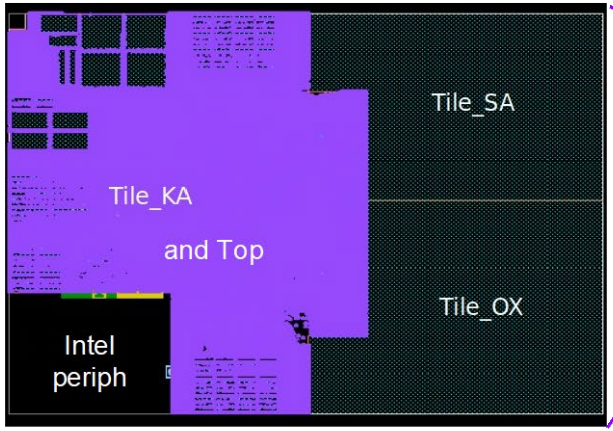


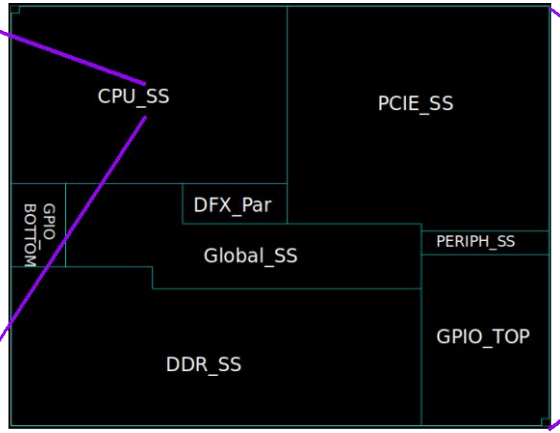
Cinco Ranch Test Chip 1

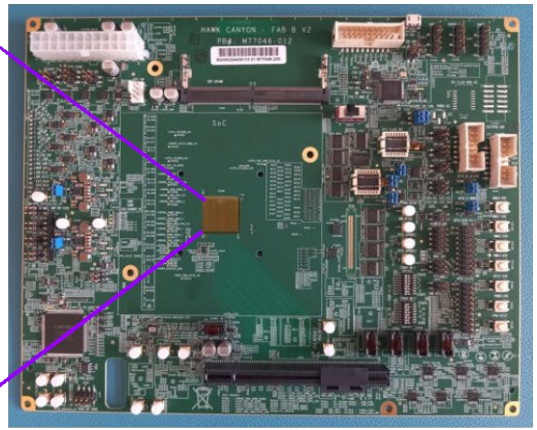
- Single core design with 3 different cores selected at boot time
  - Sargantana in-order single-issue RV64G with custom extensions for genomics sequence alignment
  - Lagarto Ka dual-issue out-of-order with a 16-lane Vitruvius RVV1.0 VPU
  - Lagarto Ox 6-way out-of-order RV64GC
- Tech. node: Intel3



Cinco Ranch Test Chip 1







BSC cpu subsystem

CincoRanch TC1 chip

Hawk Canyon platform

- Area (Intel3):
  - CPU: 3.2mm2
  - Die size 4,05mm * 3,75mm (15,2mm2)
- Submitted for fabrication in Nov 2024
-

- Boards received in Jan 2025 (without chips)
- Intel received chips in the end of May
- Chips expected at BSC in the end of June
- Bring-up during July-Sept 2025
- Successful Linux boot!!

Cinco Ranch TC1 Board

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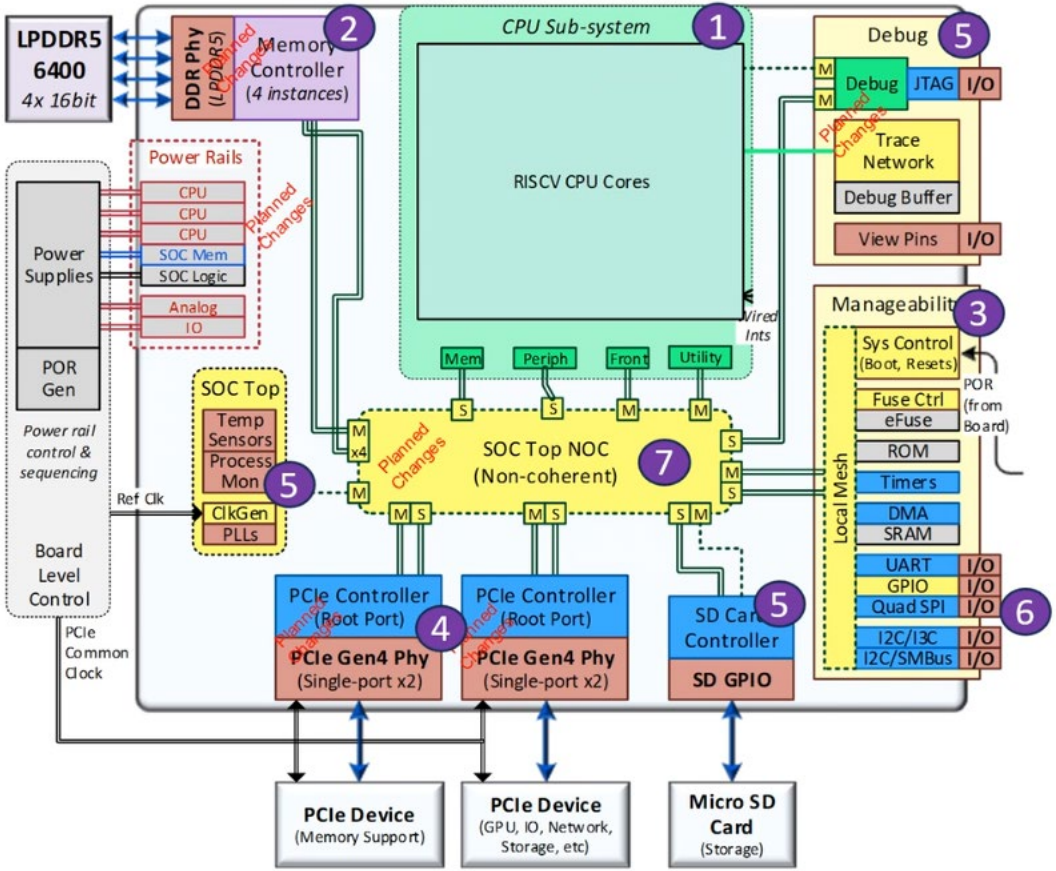
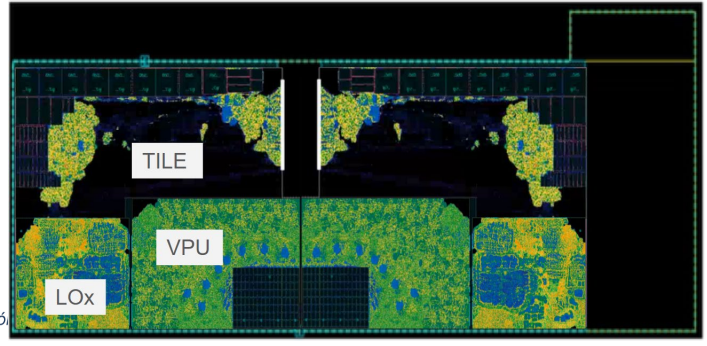
Cinco Ranch Test Chip 2

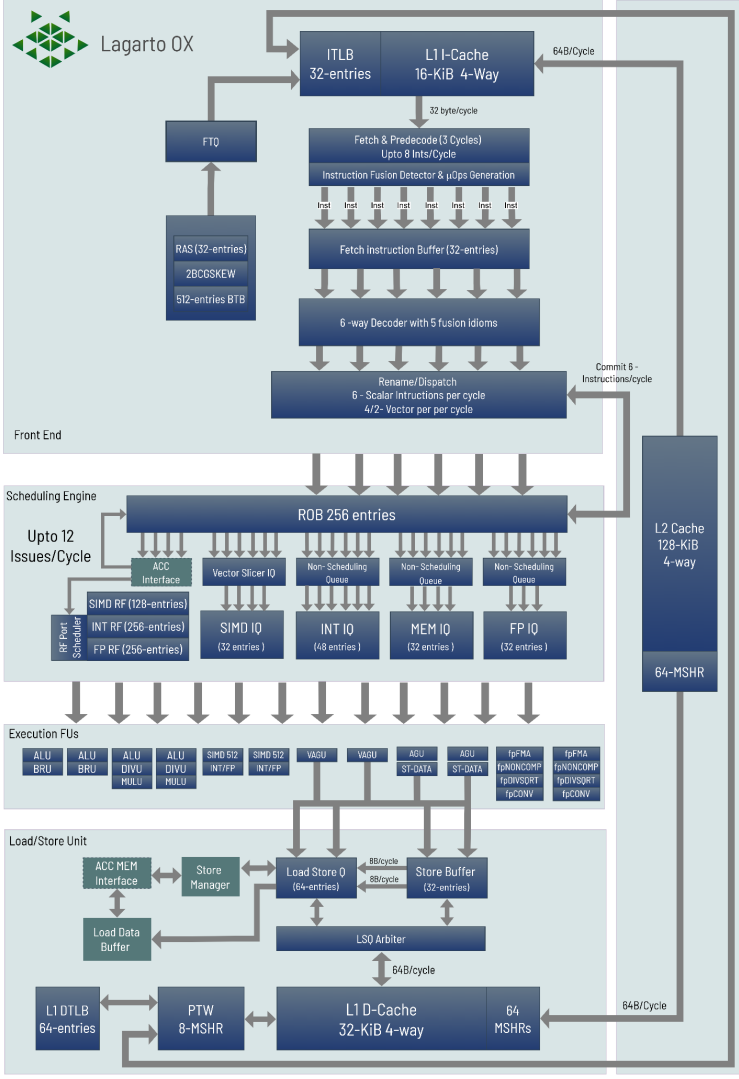
- Very similar top-level IPs with increased performance
- Increased memory BW
- New technology node: **Intel 18A**
- More area: 12x4mm2 (die), ~5mm2 (BSC), ~12mm2 (OCT)
- **Access to PDK!**
- AXI5 interface with CPU
- New address mapping



Cinco Ranch Test Chip 2

- Dual core design
  Lagarto Ox 6-way out-of-order RV64GC
  RVV1.0 VPU with 32 FPUs (8 lanes, 4FPUs per lane)
  Three-level cache hierarchy
  Boots Ubuntu, Fedora and Arch distributions
- RTL freeze in Oct 2025
- Submission for fabrication in Feb 2026
- Total area: 5.2mm2





Cinco Ranch TC2 Board

THANKS

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Este proyecto está financiado por el Ministerio para la Transformación Digital y de la función pública, en el marco del Plan de Recuperación Transformación y Resiliencia – y la Unión Europea – NextGenerationEU. Los puntos de vista y las opiniones expresadas son únicamente los del autor o autores y no reflejan necesariamente los de la Unión Europea. Ni la Unión Europea ni la Comisión Europea pueden ser consideradas responsables de las mismas.

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