20/11/2025

NG-Ultra Application Development Ecosystem

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20/11/2025
13h30

Virtual Platforms / Modelisation

Marion LE PENVEN

Airbus Defence and Space – Team Leader FPGA

With support of Jean-Luc Poupat

Technical Authority

NG-Ultra Application Development Ecosystem

What component do space market dream about ?

Suitable for Space

High performance processing solution

With high flexibility for future applications

Allowing multitasks for integration

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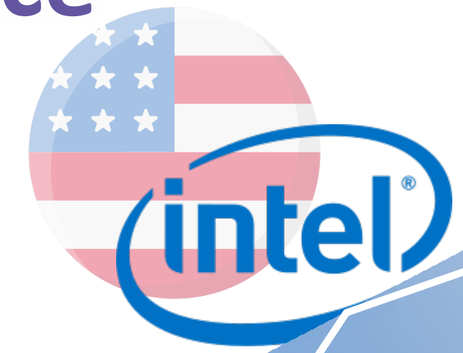

Most of the FPGA Market providers are non-European

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At the exception of NanoXplore who provides European rad-hard components

Airbus Amber

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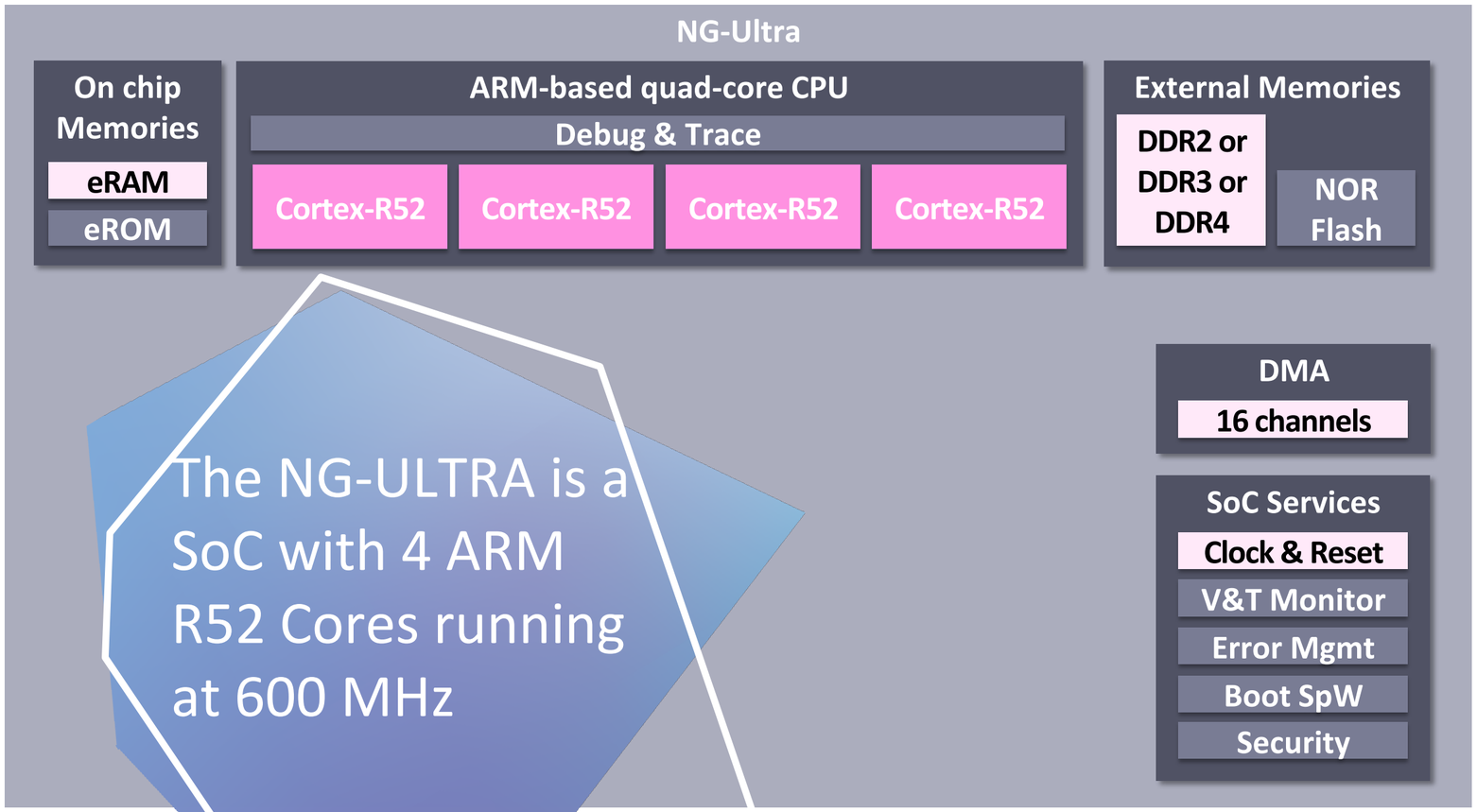

The NG-ULTRA is a SoC with 4 ARM R52 Cores running at 600 MHz

4x 32 KB Cache D
4x 384 KB TCM
4x 32 KB Cache I

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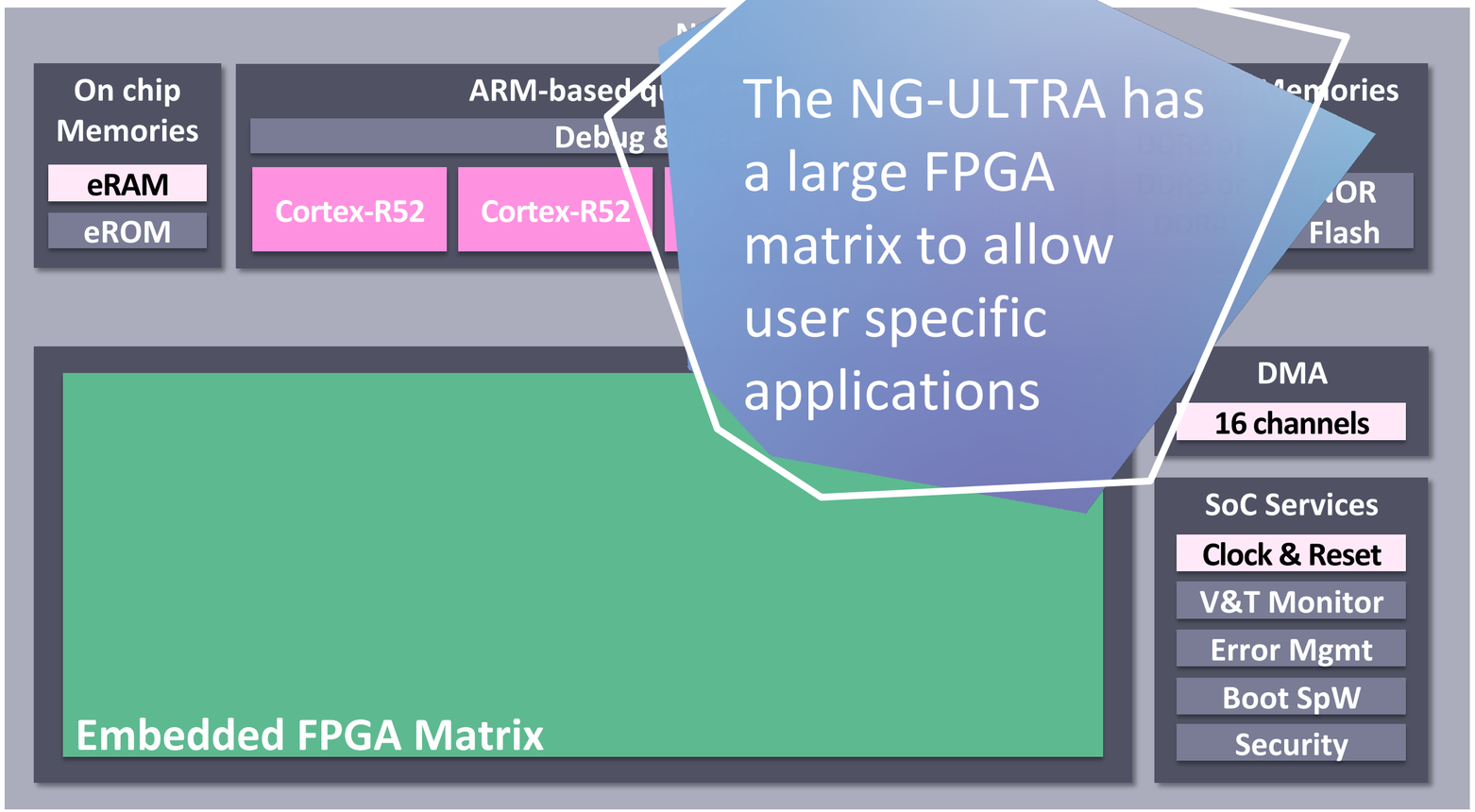

The NG-ULTRA has a large FPGA matrix to allow user specific applications

~500 KLUTs
~1500 DSP blocks
Few MB of distributed RAM

Allowing multitasks for integration

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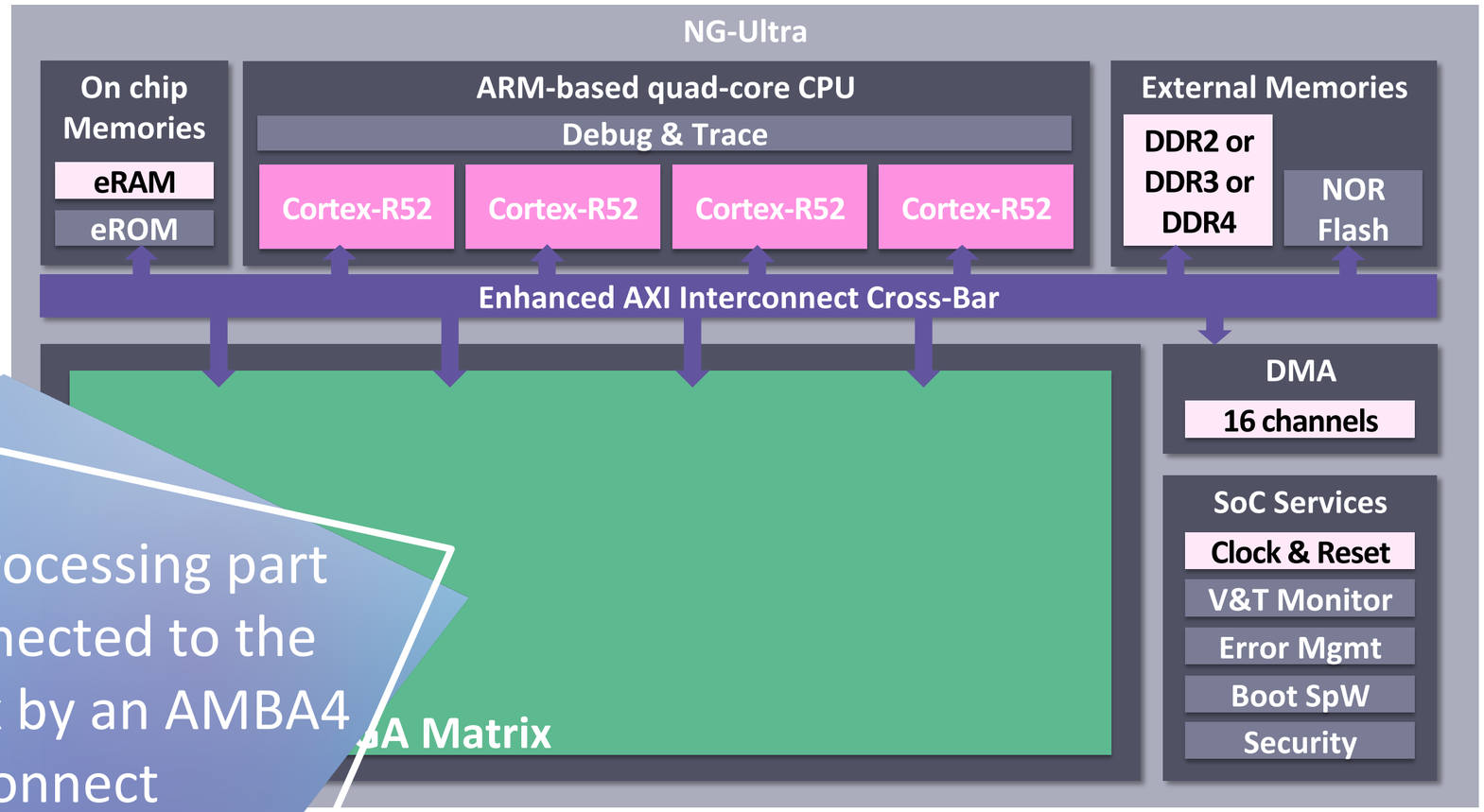

The processing part is connected to the matrix by an AMBA4 interconnect

Interconnection between all interfaces

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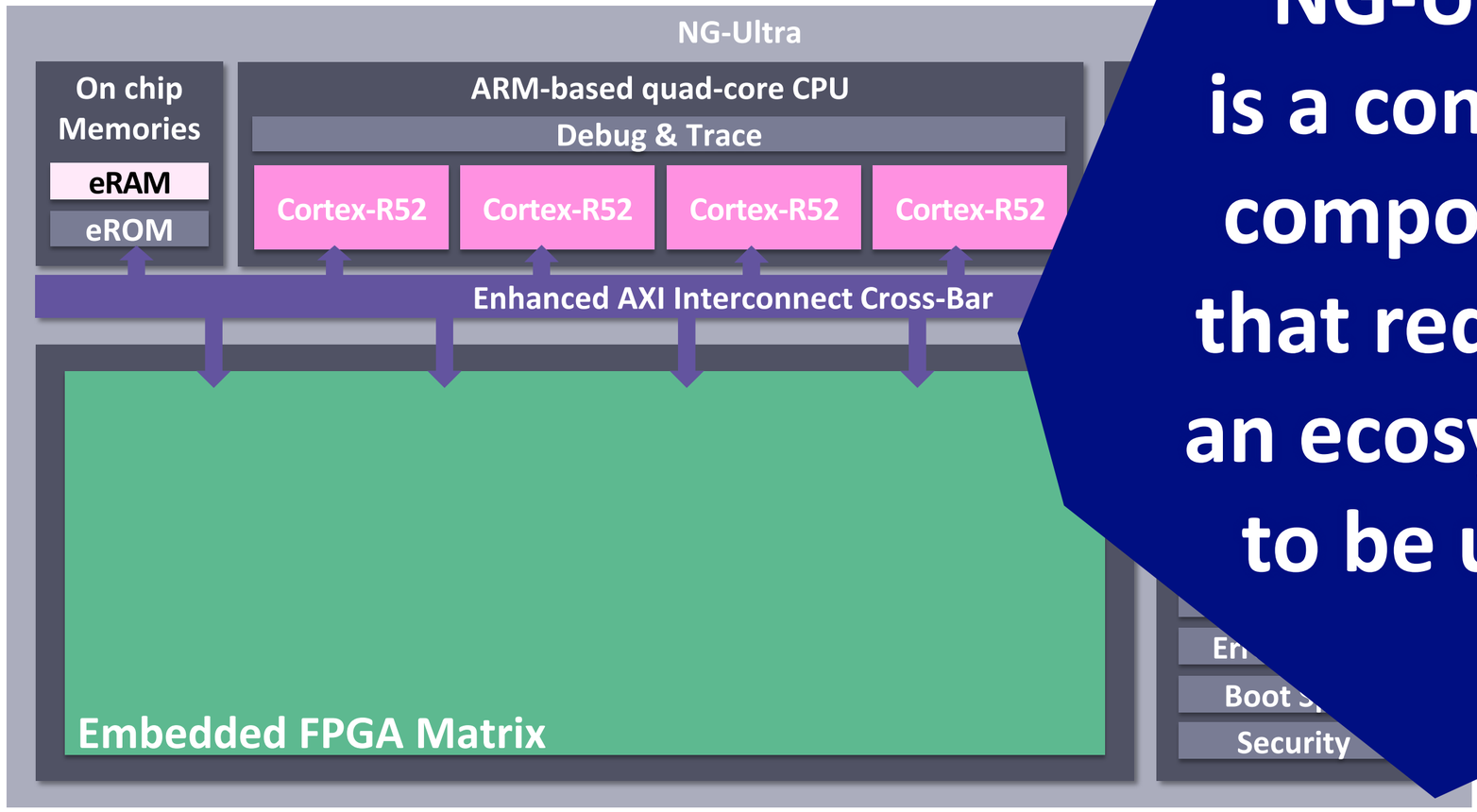
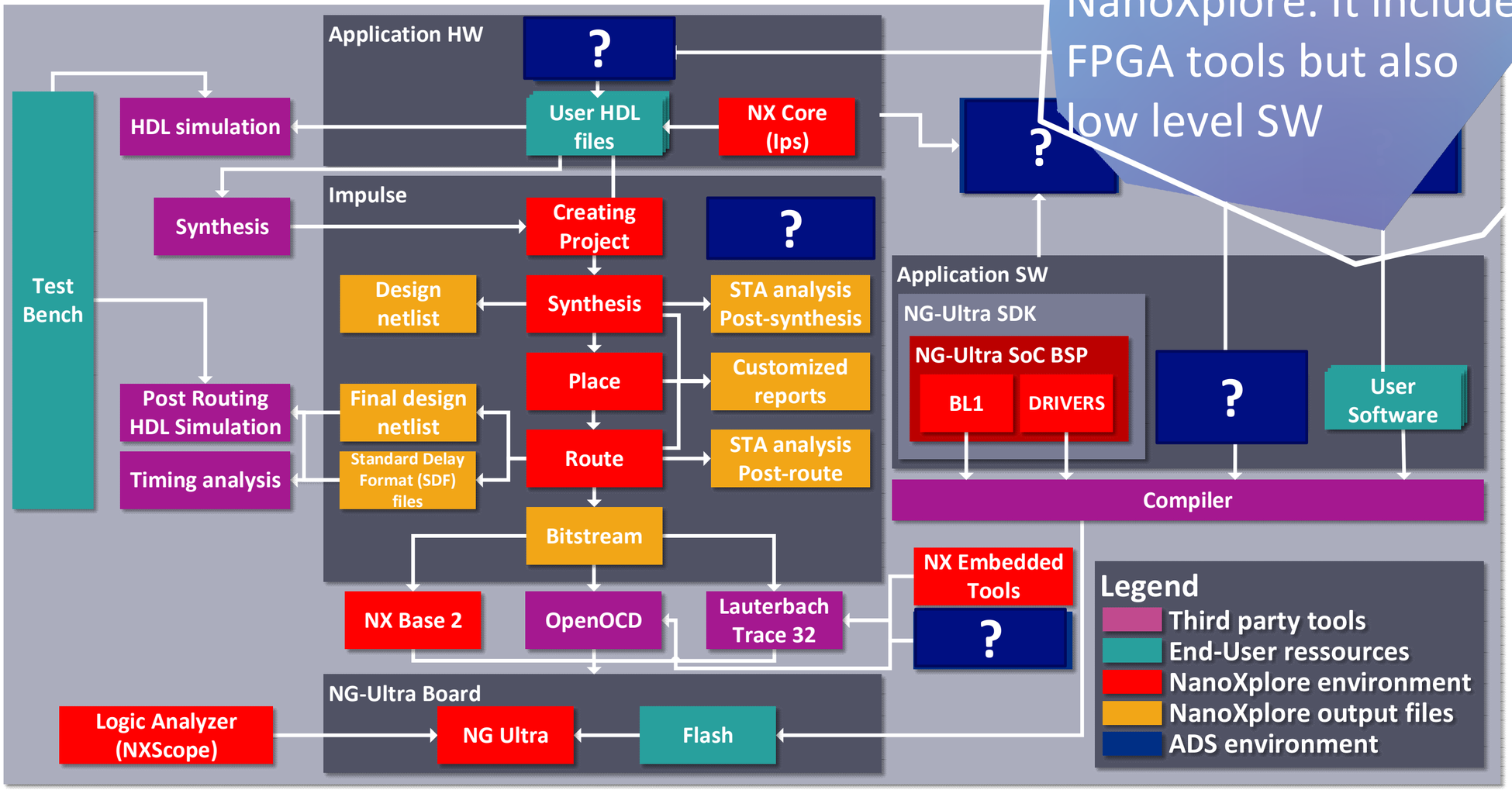


NG-Ultra is a complex component that requires an ecosystem to be used

NG-Ultra Ecosystem

The existing ecosystem is mainly provided by NanoXplore. It includes FPGA tools but also low level SW



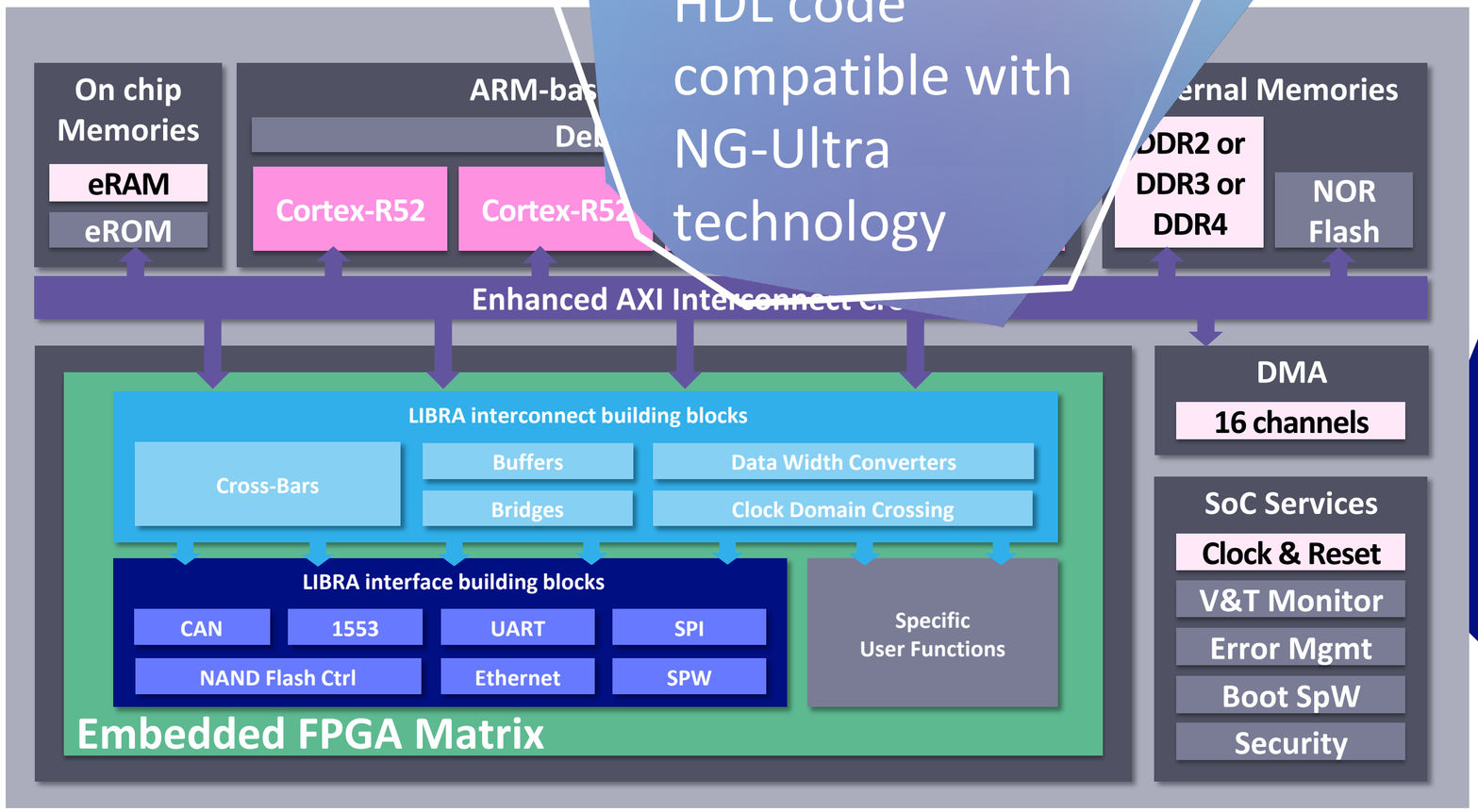
Airbus DS Objectives on NG-Ultra Ecosystem

Based on NanoXplore Tool set, Airbus DS focused its development on complementary aspects **reducing time to market of projects using NG-Ultra**:

- Full set of reusable FPGA building blocks and their associated Low-Level Software
- SW integration methodology based on Simulation and Prototyping
- High level scripts for Impulse

HDL Reuse

Airbus DS has developed generic HDL code compatible with NG-Ultra technology



Generic HDL Code
+
Generic SW driver
=
LIBRA module

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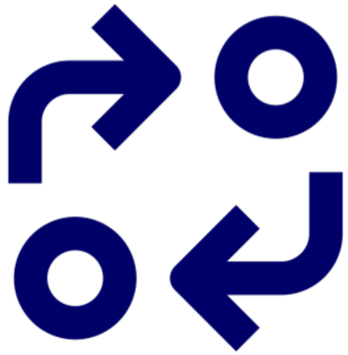
SW-based simulation platform

- Includes all the SoC specificities
- Real time execution of the Application
- No need of HW material related to NG-Ultra

SW integration

- For HW and SW debug and integration
- HW model of most of the features of the SoC
- 8 times slower runtime than actual NG-Ultra but way faster than HDL simulation run time
- No need to wait the end of the board development
- Possible to communicate with actual and real components



VHDL code debug and HW/SW integration debug

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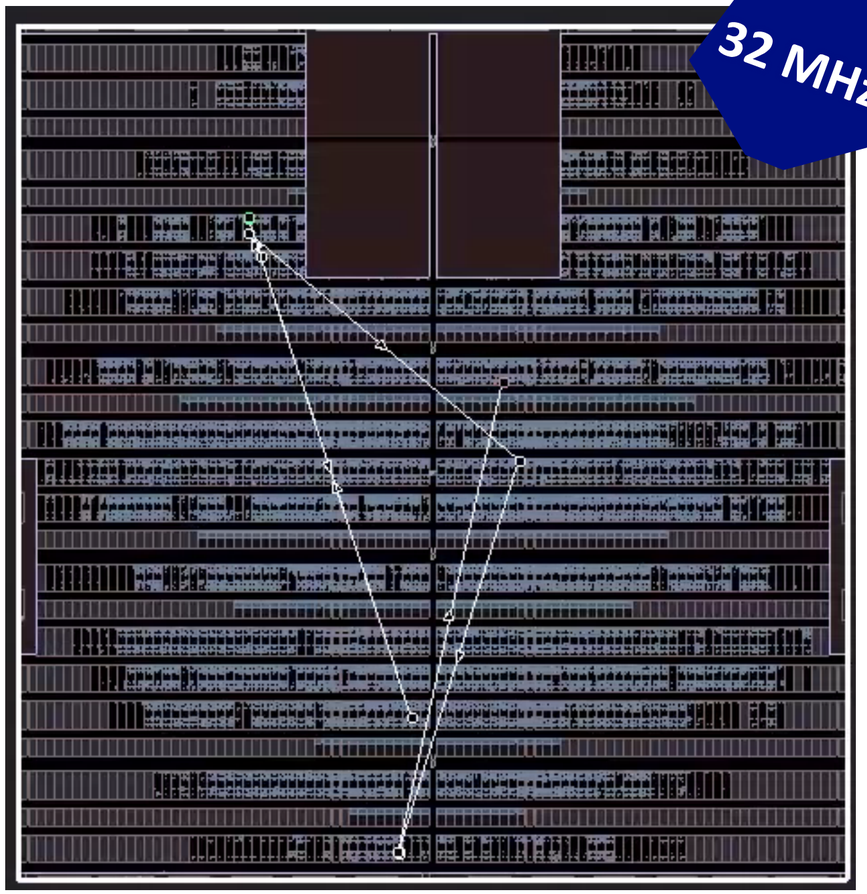
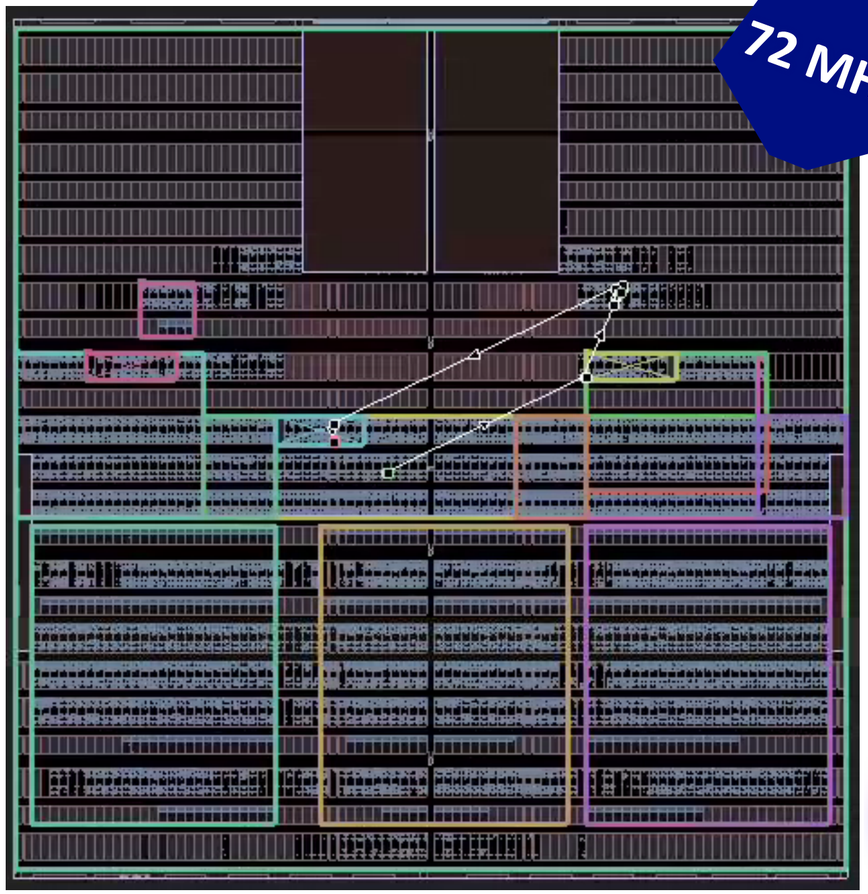
SW integration – SW-based simulation platform



Automation of constraints generation for Place and Route step of the design.



Conclusion

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High performance processing solution

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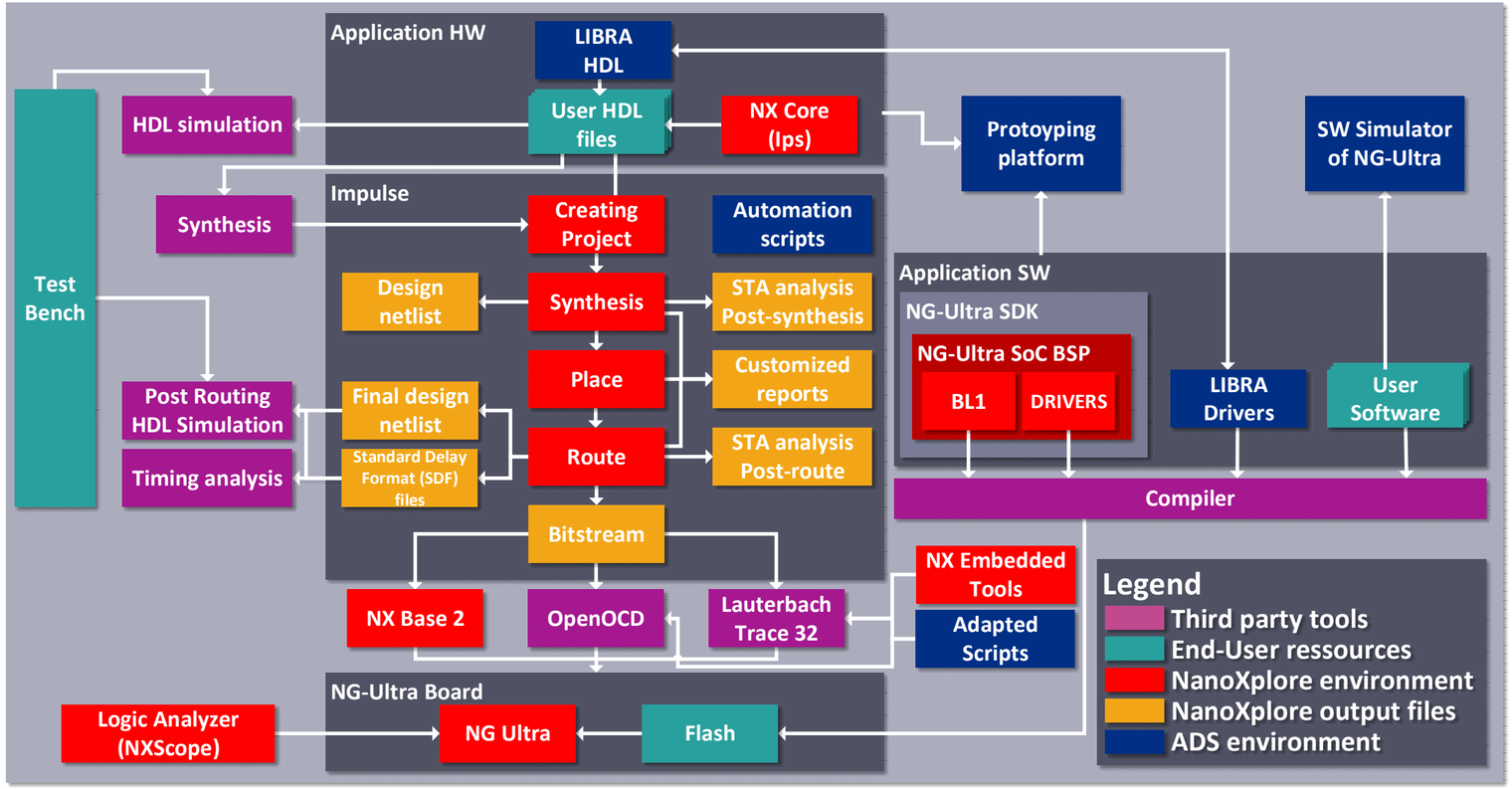

The NG-Ultra answers the needs

Airbus DS has enhanced its ecosystem

Any Questions ?