

At the Heart of a New Processor Market

Kalray MPPA[®]
Massively Parallel Processor Array

Journée Ambition Europe, 13 octobre 2017



COMPANY OVERVIEW

ACTIVITY

TEAM

Launched in 2008

Spin-off of the “CEA” (French Department of Energy)

Pioneer in manycore processors

- Focus on low latency, time critical low-power, extreme processing processors
- Core market: Data Centers and Critical Embedded Applications

Comprehensive product offer

- MPPA® processors, acceleration cards, associated software
- Strategic partnership with TSMC

Adopted by FORTUNE 500 companies

1st

COMMERCIAL
PROCESSOR TO
BREAK THE “100
COMPUTING CORE
WALL” -2013

TOP20

“MOST PROMISING
HPC SOLUTION
PROVIDERS” – CIO
REVIEW - 2016

21

NUMBER OF
GRANTED PATENTS
HELD BY KALRAY
FOR ITS MANYCORE
ARCHITECTURE

Kalray offices



Two offices

Grenoble, France & Los Altos, CA, USA

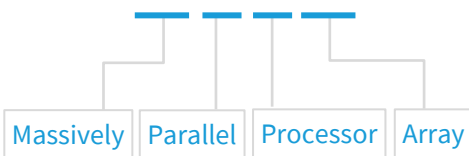
Experienced Technical Team

World-leading multicore/manycore talent, with experience in both hardware & software

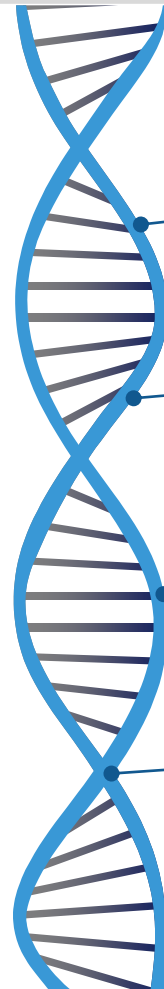
KALRAY: PIONEER OF MANYCORE PROCESSORS

Kalray has paved the way to the manycore adoption with its unique manycore architecture

MPPA[®]



Ground-breaking architecture in our DNA:

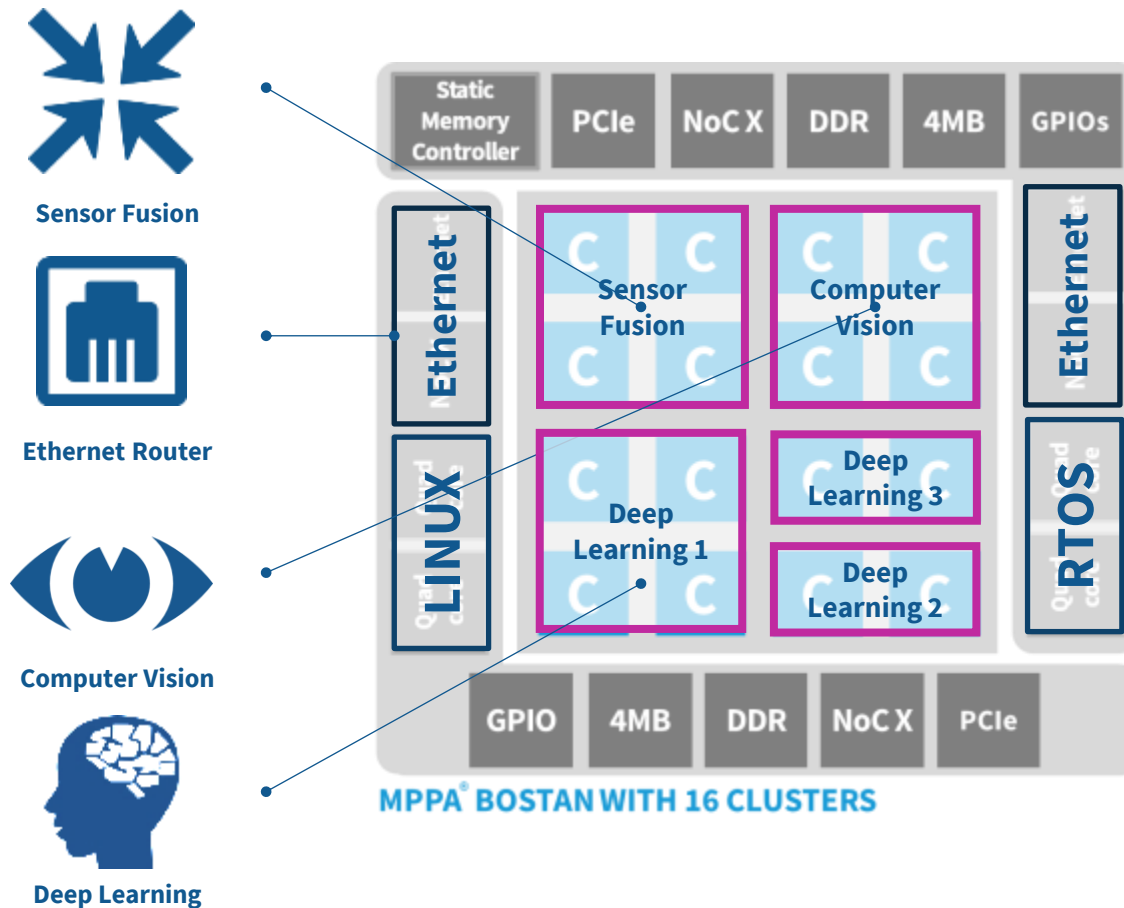


- #1 Extreme computing
- #2 Real-time performance
- #3 Low energy consumption
- #4 Programmability

- 1st**
COMMERCIAL PROCESSOR TO BREAK THE "100 COMPUTING CORE WALL" -2014
- TOP 20**
"MOST PROMISING HPC SOLUTION PROVIDERS" - CIO REVIEW - 2016
- 21**
NUMBER OF KEY PATENTS HELD BY KALRAY FOR ITS MANYCORE ARCHITECTURE
- 1/10**
THE LEVEL OF POWER CONSUMPTION COMPARED WITH COMPETITORS

WHAT MAKES KALRAY ARCHITECTURE UNIQUE?

MULTIPLE-APPLICATION SOC FOR MULTI-MODAL



BENEFITS

- **Simpler** execution platform with one ISA
- **Multiple** Compute-intensive functions run in parallel
- **Mixed criticality** with no interference between partition

KALRAY ADDRESSES TWO FAST-GROWING SEGMENTS REQUIRING REAL TIME PERFORMANCE AND PROGRAMMABILITY



DATA CENTER

SMART STORAGE
SMART NETWORKING



CRITICAL EMBEDDED SYSTEMS

NEW AEROSPACE AND DEFENSE SYSTEMS
AUTONOMOUS VEHICLES

INNOVATION

1 EFFICACITE ENERGETIQUE

MULTI - FONCTIONS, PARALLELES
ET INDEPENDANTES

2

3 CRITICITE MIXTE

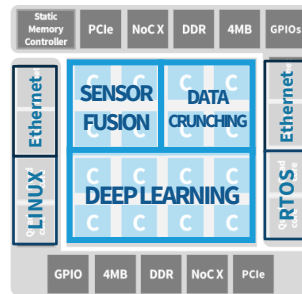
PERFORMANCES SCALABLES

4

5 HAUTE PERFORMANCE

SURETE / CYBERSECURITE

6



Sur la même puce

ON-GOING EUROPEAN PROJECTS

4KREPROSYS : 4K ultraHD TV wireless REmote PROduction SYStems (CELTIC+)

- Industrial: AMPVISUALTV, Eurovision, Nulink, Worldlinx, Gurulogic, Optofidelity, Siru, Supponor
- Academic: INSA, EPFL, TUT
- Investigating and developing low latency encoding / decoding of 4K format on MPPA

EXANODE: European Exascale Processor Memory Node Design (H2020)

- Industrial: ARM, SCAPOS, Bull, Virtual OpenSys
- Academic: CEA, ETH, Forth, Fraunhofer, Univ Manchester, Univ Barcelona, CNRS
- Develop highly efficient, highly integrated, multi-way, high performance, heterogeneous compute element

ASSUME : Affordable Safe & Secure Mobility Evolution (ITEA3)

- Industrial: Airbus Operations, AbsInt, Bosch, Daimler, Kalray, Safran, SNECMA, Thales RT
- Academic: ENS Paris, INRIA
- Demonstrate the potential of the MPPA platform into the software tools ecosystem for aerospace & automotive

KEY FACTORS

Will to address international / European markets

Strong link between national / European project

- National Project Officers
- Clusters

Qualitative consortium

- Value chain
- Best academics
- Strong interactions between partners → Collaborative

Difficulties

- Low success rate
- Excellence: clarity, credibility, innovation
- Impact: market opportunity, competitiveness, benefit for Society
- Quality and Efficiency of the implementation: risk, work program, complementarity

Advantages

- Quick processing
- Ease of use (PCA, portail, rates)
- Valuable dynamic partnerships

Merci!



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