European Exascale System Interconnect & Storage

www.exanest.eu

Manolis Katevenis, Coordinator

Foundation for Research & Technology - Hellas (FORTH)

FET-HPC (Nov’14) Projects Meeting, Rome, 30 Sep. 2015
What ExaNeSt is all about:

System architecture for Exascale and datacentric HPC
• Fast, distributed *in-node* non-volatile-memory *Storage*
• Low-latency *unified Interconnect* (compute & storage traffic)

**Extreme compute-power density**
• Advanced *totally-liquid Cooling* technology (ICEOTOPE)
• Scalable packaging for 64-bit ARM-based Microservers

**Real scientific and data-center applications**
• Applications used to identify system requirements
• Tuned versions will evaluate our solutions

**System prototype used for real-life evaluations**
• Interconnect + storage + compute + applications
• 1000+ ARM cores in 3 liquid-cooled chassis
Racks using total liquid cooling

ICEOTOPE current solutions
• Immersed liquid cooled systems based on convective cells
• 60 kW per rack
  — 800 W per blade

Enhancements planned during ExaNeSt
• Next generation Iceotope cooling technology
• target up to 240 kW/rack
Collaborations with:

**EuroServer:** Green Comp. Node for European μServers (2013-2016)
- UNIMEM address space model among ARM compute nodes
- Storage and I/O shared among multiple compute nodes

**ExaNoDe:** European Exascale processor-memory Node Design
- ARM-based Chiplets on silicon Interposer

**ECOSCALE:** Energy-efficient Heterogeneous Computing at exaSCALE
- Heterogeneous infrastructure (ARM + FPGAs), programming, runtimes

**Kaleao Ltd.:** new generation platforms, by converging compute, storage, and networking into efficient, compact, transparent server solutions

*Plus others to grow out of today’s meeting...*
The ExaNeSt Consortium

- **Storage & data**
  - Fraunhofer ITWM
  - Virtual Open Systems
  - Netherlands
  - France

- **Applications**
  - allinea
  - UK
  - Italy

- **Interconnects**
  - FORTH Institute of Computer Science
  - UPV - ES
  - UK

- **Technology**
  - ICEOTOPE
  - UK
  - MANCHESTER 1824

- **Greece** - coordinator

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- Interconnection Network
- In-node Storage
- Advanced Cooling
- Real Applications

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