MANGO

Project reference: 671668
Funded under: H2020-EU.1.2.2.

MANGO: exploring Manycore Architectures for Next-GeneratiOn HPC systems

From 2015-10-01 **to** 2018-10-01, ongoing project

Project details

Total cost:	Topic(s):
EUR 5 801 820	FETHPC-1-2014 - HPC Core Technologies, Programming Environments and Algorithms for Extreme Parallelism and Extreme Data Applications
EU contribution:	**Call for proposal:**
EUR 5 801 820	H2020-FETHPC-2014
Coordinated in:	**Funding scheme:**
Spain	RIA - Research and Innovation action

Objective

MANGO targets to achieve extreme resource efficiency in future QoS-sensitive HPC through ambitious cross-boundary architecture exploration for performance/power/predictability (PPP) based on the definition of new-generation high-performance, power-efficient, heterogeneous architectures with native mechanisms for isolation and quality-of-service, and an innovative two-phase passive cooling system. Its disruptive approach will involve many interrelated mechanisms at various architectural levels, including heterogeneous computing cores, memory architectures, interconnects, run-time resource management, power monitoring and cooling, to the programming models. The system architecture will be inherently heterogeneous as an enabler for efficiency and application-based customization, where general-purpose compute nodes (GN) are intertwined with heterogeneous acceleration nodes (HN), linked by an across-boundary homogeneous interconnect. It will provide guarantees for predictability, bandwidth and latency for the whole HN node infrastructure, allowing dynamic adaptation to applications. MANGO will develop a toolset for PPP and explore holistic pro-active thermal and power management for energy optimization including chip, board and rack cooling levels, creating a hitherto inexistent link between HW and SW effects at all layers. Project will build an effective large-scale emulation platform. The architecture will be validated through noticeable examples of application with QoS and high-performance requirements.

Ultimately, the combined interplay of the multi-level innovative solutions brought by MANGO will result in a new positioning in the PPP space, ensuring sustainable performance as high as 100 PFLOPS for the realistic levels of power consumption (<15MWatt) delivered to QoS-sensitive applications in large-scale capacity computing scenarios providing essential building blocks at the architectural level enabling the full realization of the ETP4HPC strategic research agenda

Coordinator

UNIVERSITAT POLITECNICA DE VALENCIA
Spain

Spain
EU contribution: EUR 418 875

Participants

Centro Regionale Information Communication Technology scrl
Italy

Italy

EU contribution: EUR 571 250

POLITECNICO DI MILANO
Italy

Italy

EU contribution: EUR 646 875

SVEUCILISTE U ZAGREBU FAKULTET ELEKTROTEHNIKE I RACUNARSTVA
Croatia

Croatia

EU contribution: EUR 436 000

PRO DESIGN Electronic GmbH
Germany

Germany

EU contribution: EUR 1 860 963,75

THALES COMMUNICATIONS & SECURITY SAS
France

France

EU contribution: EUR 452 207,5

ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE
Switzerland

Switzerland

EU contribution: EUR 522 083,75

PHILIPS MEDICAL SYSTEMS NEDERLAND BV
Netherlands

Netherlands

EU contribution: EUR 495 940

EATON INDUSTRIES (FRANCE) SAS
France

France

EU contribution: EUR 397 625

Last updated on 2015-07-13
Retrieved on 2015-11-16

Permalink: http://cordis.europa.eu/project/rcn/197942_en.html
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