TANGO

TANGO has launched and participates in the **Heterogeneity Alliance**, a joint initiative with other projects and organisations to create a community of interest and business around heterogeneity challenges. Join it!

H-HW&SW
Heterogeneous Hardware & Software
Alliance

www.**heterogeneityalliance**.eu

The TANGO project is being undertaken by global service provider Atos (Spain) and its subsidiary specialized in HPC, Bull (France); the European company Deltatec (Belgium); and researchers from the University of Leeds (UK); the CETIC - Centre d'Excellence en Technologies de l'Information et de la Communication (Belgium); and Barcelona Supercomputing Center (Spain).

For more information about the project contact us:

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Atos

BSC Barcelona Supercomputing Center Centro Nacional de Supercomputación

Bull atos technologies

cetic

DELTATEC

UNIVERSITY OF LEEDS

Simplify & Optimize Heterogeneity

Simplifying the way developers approach the development of next-generation applications based in heterogeneous hardware architectures, configurations and software systems including heterogeneous clusters, chips and programmable logic devices

Optimizing various dimensions of software design and operations (energy efficiency, performance and dependability on target architectures)
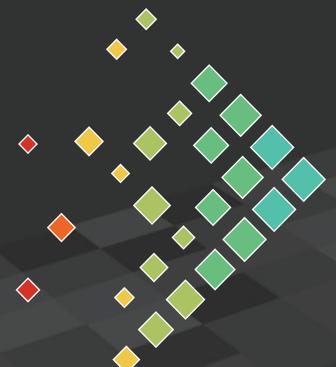
◆ Design

◆ Development

◆ Deployment

◆ Operations

◆ Optimization

for Heterogeneous Hardware

TANGO

TANGO Toolbox is a set of modular, open and interoperable tools to design, model, develop and execute optimised software in heterogeneous hardware

Placer is a design-time tool that optimizes the placement and scheduling of complex software onto heterogeneous platforms

DTC-Poroto enables the generation and early performance characterisation of FPGA-offloaded kernels for user defined computations

Code Profiler is a tool for analysing Java code for its energy efficiency

Programming Model and Runtime Abstraction Layer is a combination of COMPSs and OmpSs task-based programming models, which simplifies the development of parallel application for distributed heterogeneous platforms.

Monitoring Infrastructure monitors the heterogeneous resources to provide metrics about the status of the various devices and also historical statistics

ALDE is responsible for the workload scheduling and the management of the application life-cycle while it is executed
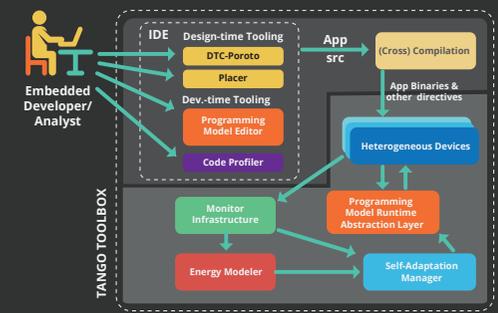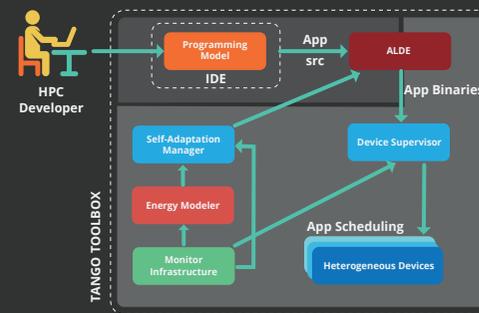
Self-Adaptation Manager is responsible for the adaptive behaviour of heterogeneous architectures

Energy Modeller forecasts future application and host power consumption, as well as reporting current and historic energy usage

Device Emulator finds an efficient mapping of the application tasks onto the nodes/cores in low time, i.e., which application task should run on each node/core

Device Supervisor is an extension of Slurm (JobPack) which is an open-source cluster resource management and job scheduling system

TANGO can be used in several scenarios, such as for example, to facilitate the programing, automatic deployment and energy optimization of HPC or embedded applications in heterogeneous devices

HPC Developer
Programming Model — IDE — App src — ALDE — App Binaries
Self-Adaptation Manager — Device Supervisor
Energy Modeler
Monitor Infrastructure
App Scheduling — Heterogeneous Devices
TANGO TOOLBOX

Embedded Developer/ Analyst
IDE — Design-time Tooling — DTC-Poroto — Placer — App src — (Cross) Compilation
Dev.-time Tooling — Programming Model Editor — Code Profiler — App Binaries & other directives — Heterogeneous Devices
Monitor Infrastructure — Programming Model Runtime Abstraction Layer
Energy Modeler — Self-Adaptation Manager
TANGO TOOLBOX

FAST Prototyping
from software emulation & hardware-in-the-loop

Monitor
underlying infrastructures

Define runtime self-adaptation
behaviors

Abstract & Use Heterogeneous Hardware
with TANGO Programming Model

Specify Application critical and non-critical
quality behaviors

Optimize Energy
performance and much more