LEGaTO
Low Energy Toolset for Heterogeneous Computing

Project Kickoff @ December 2017

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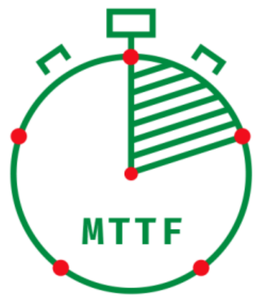
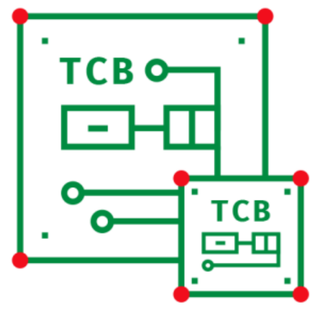
LEGaTO Project Goals

One order of magnitude improvement in energy-efficiency for heterogeneous hardware through the use of the energy-optimized programming model and runtime.



5× decrease in Mean Time to Failure through energy-efficient software-based fault tolerance.



Size reduction of the trusted computing base by at least an order of magnitude.

5× increase in FPGA designer productivity through the design of novel features for hardware design using dataflow languages.

LEGaTO Approach

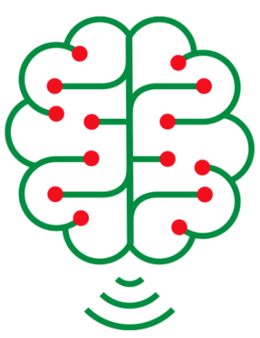
Starting with Made-in-Europe mature software stack, and optimizing this stack to support energy-efficiency

Integrated software stack supporting task-based programming model

Computing on a commercial cutting-edge European-developed CPU–GPU–FPGA heterogeneous hardware substrate and FPGA-based Dataflow Engines (DFE)

Three use-cases (Smart home/city, AI, health) to test the integrated stack

Use Cases



Healthcare

Will demonstrate not only a decrease in energy consumption but an increase in healthcare application resilience and security.

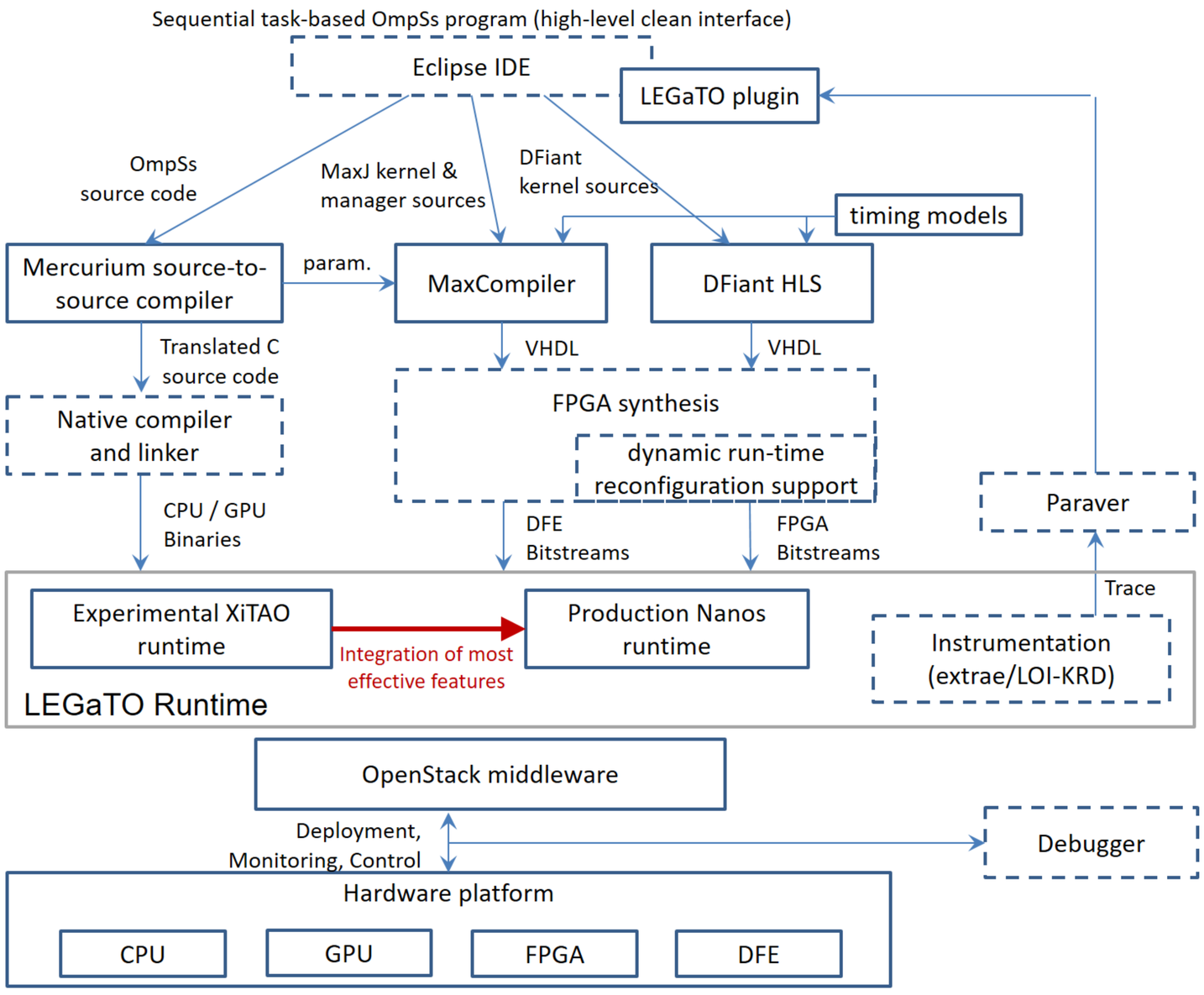
IoT for Smart Homes and Cities

The LEGaTO project software–hardware framework for the IoT will demonstrate ease of programming and energy savings in smart homes and smart cities application.

Machine Learning

Will improve energy efficiency by employing accelerators and tuning the accuracy of computations at runtime using CNNs and LSTM.

LEGaTO Stack



LEGaTO Partners

BSC (Barcelona Supercomputing Center)

Chalmers (Chalmers University of Technology)

UNINE (University of Neuchatel)

TUD (Technical University of Dresden)

CHR (Christmann GMBH)

UNIBI (University of Bielefeld)

TECHNION (Israel Institute of Technology)

MAXELER (Maxeler Technologies Limited)

MIS (Machine Intelligence Sweden)

HZI (Helmholtz Centre for Infection Research)

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www.legato-project.eu