# LavA: An Open Platform for Rapid Prototyping of MPSoCs

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### **Overview**

- Configurable hardware is becoming increasingly powerful and less expensive, which allows developers to design complex systems on chip.
- **Problem:** Design of complex heterogeneous multiprocessor systems is error-prone and time **consuming** - even if performed



#### **Model-Driven Approach**

- Approach abstracts from hardware details and the **Iow-level configuration** to reduce complexity.
- Model describes the hardware from a high systemlevel perspective.
- Basis for model creation is a **meta-model**, which provides the various components (available CPUs, Peripherals) and **describes valid compositions**.

using hardware description languages.

LavA provides a streamlined toolchain and workflow to rapidly prototype complex, heterogeneous multiprocessor systems-on-chip based on tools from software product line engineering.

## **Hardware Configuration**

- LavA's hardware basis is an **extensible library of** VHDL-based open source IP components for **MPSoCs** - extended with component-specific configuration options.
- Frame technology-based configuration of complex communication structures and local buses: configuration of hard- and software independent of implementation languages.
- Configuration process supports possibilities to **easily** integrate new peripheral components in LavA.

#### Advantages:

- Abstract High-Level View: Results in a fast and easy design process from model to FPGA.
- Fast Reconfiguration: Rapid changing of a few aspects of the system for design space exploration.
- Less Error-Prone: Model and check-rules save the developer from incorrect configurations.

context mmMPSoC::SoC if (UARTList.size > 0) ERROR "IRQ-Controller missing in SoC" + Id : (UARTList.forAll(e|e.IRQ==**false**)) || (IRQCtrl!=**null**);

**No Proprietary Tools:** The tools used in LavA are freely available.





