

Simulation Track

PreMaDoNa kick-off meeting

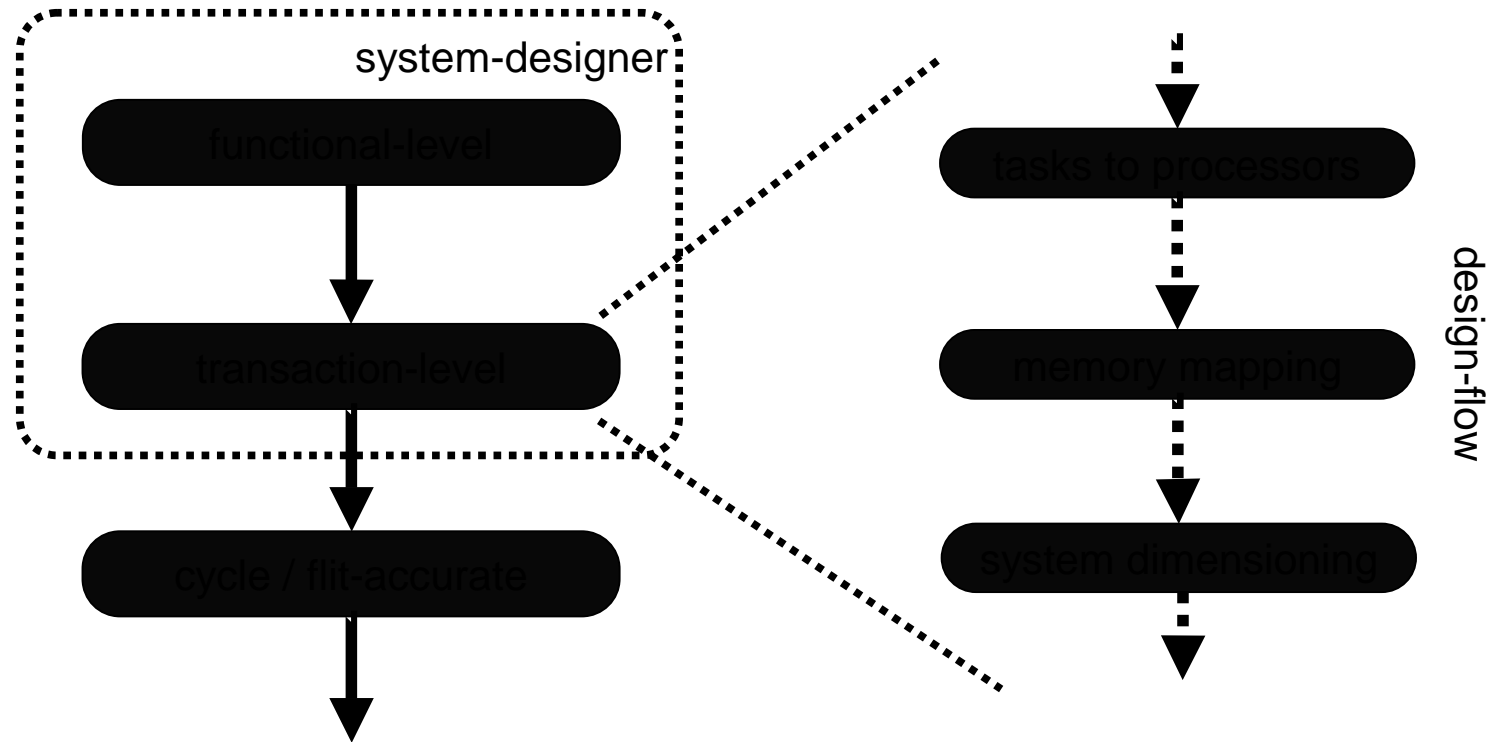
Sander Stuijk and Orlando Moreira
October 15th, 2004

Analysis and simulation?

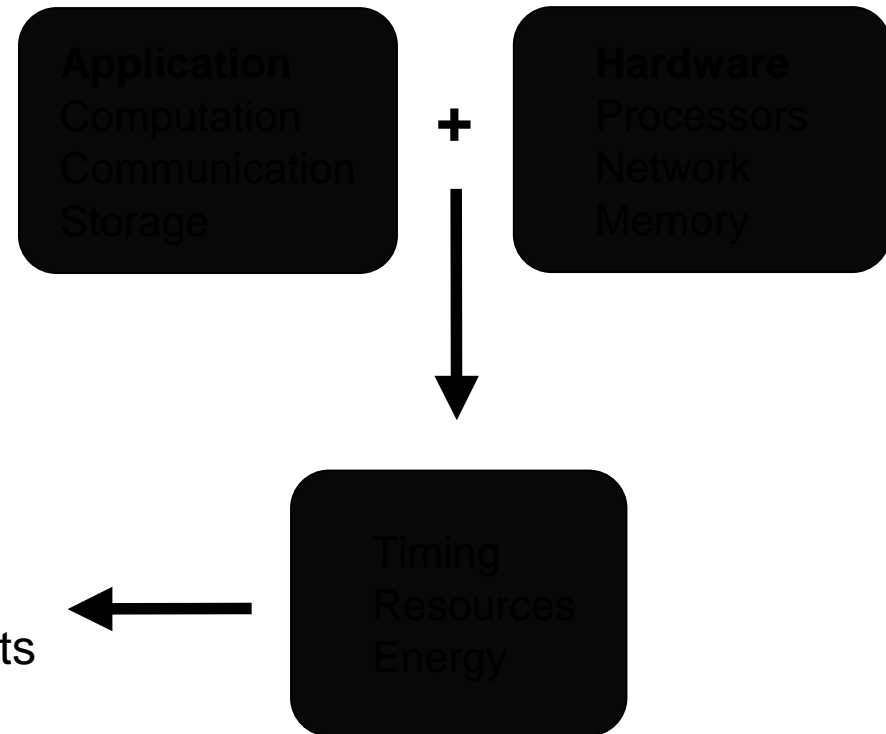
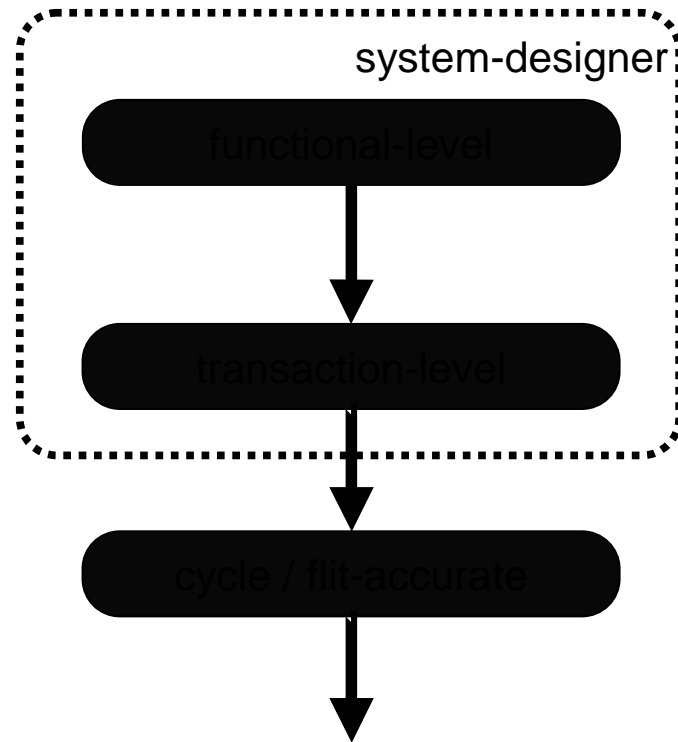
- Analysis techniques do not exist for all relevant aspects of a system design (e.g. perceived quality);
- Simulation can be used to study system behavior for specific input stream (soft real-time);
- Confirming analysis results;
- Profiling in dynamic context for hard real-time;

Predictability: analysis + simulation

Design flow



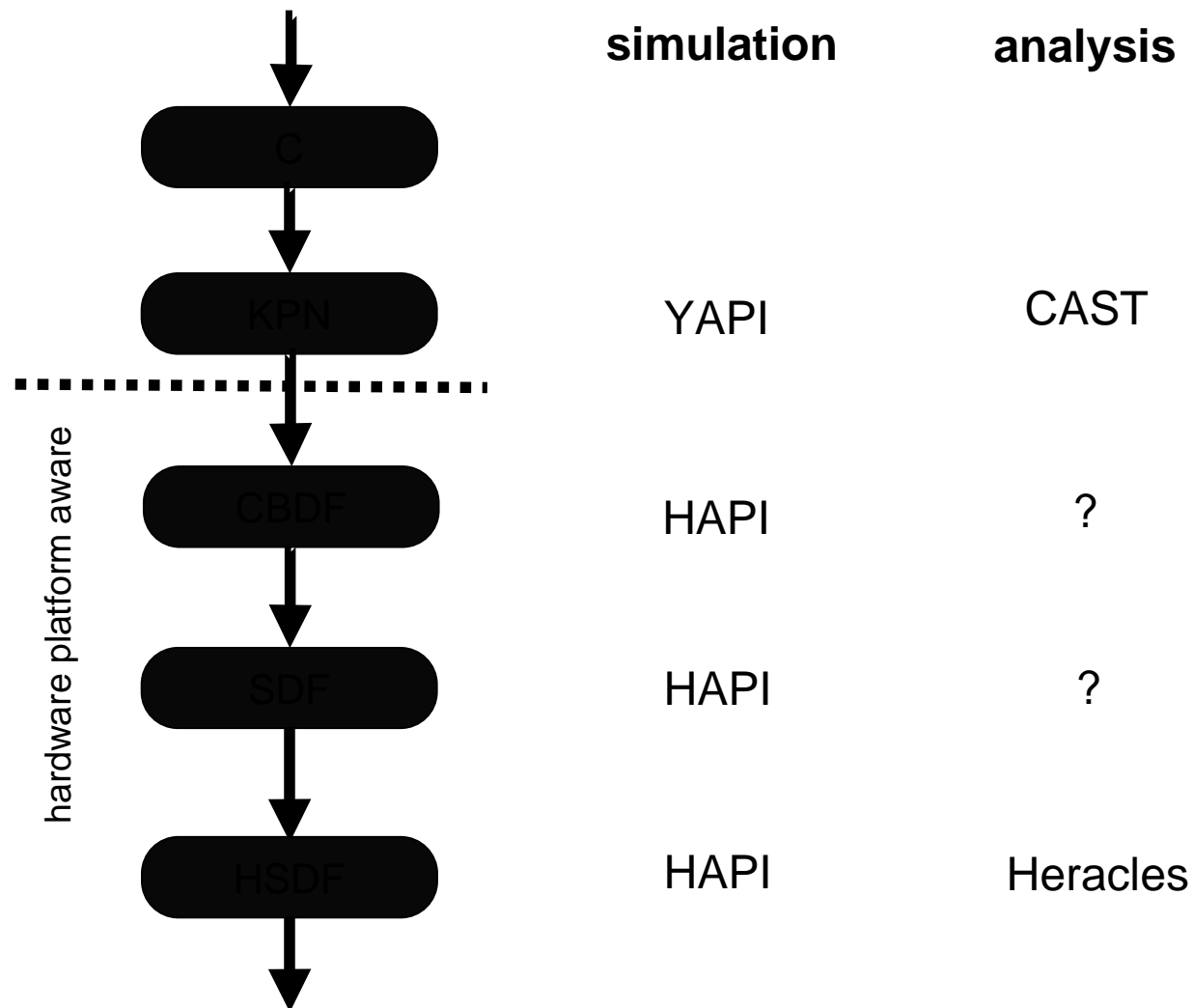
Design flow



quality: deadline misses,
number processed objects

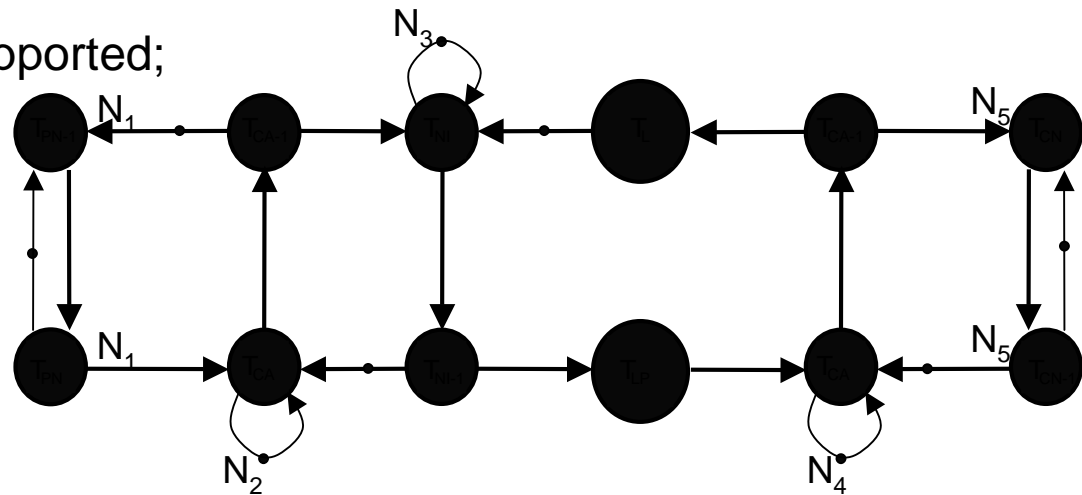
Transaction-level simulation

Provides quantification of relevant aspects of architecture / application combination, while abstracting from architectural details.



Simulation environment: HAPI

- Conditional boolean data flow environment;
- Model for predictable sharing of computational resources;
- Model for Aethereal guaranteed throughput channel;
- Model for mapping large data structures in a system-on-chip;
- Mixed simulation between abstract time and cycle-accurate simulators;
- Focus is on timing;
- Reconfiguration is not yet supported;



Research topics

- Statistical analysis in combination with simulations
- Code analysis / transformations
 - Block per block
 - Worst-case
 - Based on input data sets
- Mixed-level simulation
- Standardized interface between profiling tools and simulators

