

# The Palladio Approach: Design and Simulation of Software Architectures

Prof. Dr. Steffen Becker

Jun.-Prof Dr. Anne Koziolk

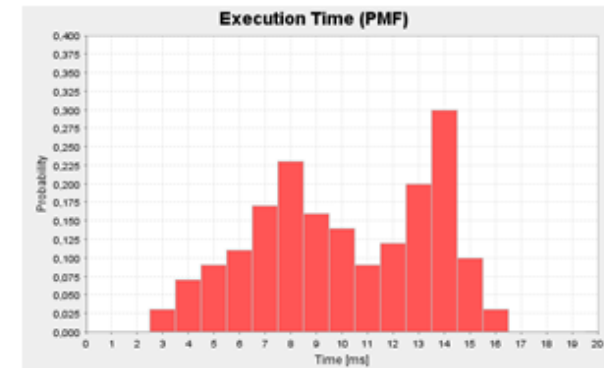
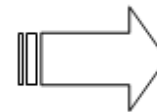
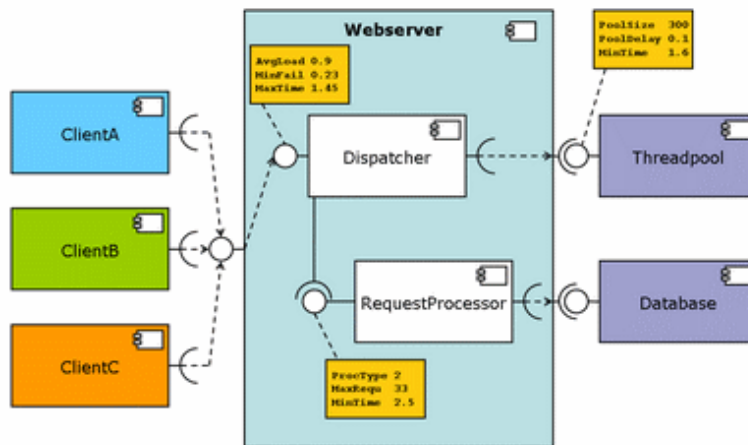
Prof. Dr. Ralf H. Reussner

SOFTWARE DESIGN AND QUALITY GROUP  
INSTITUTE FOR PROGRAM STRUCTURES AND DATA ORGANIZATION, FACULTY OF INFORMATICS



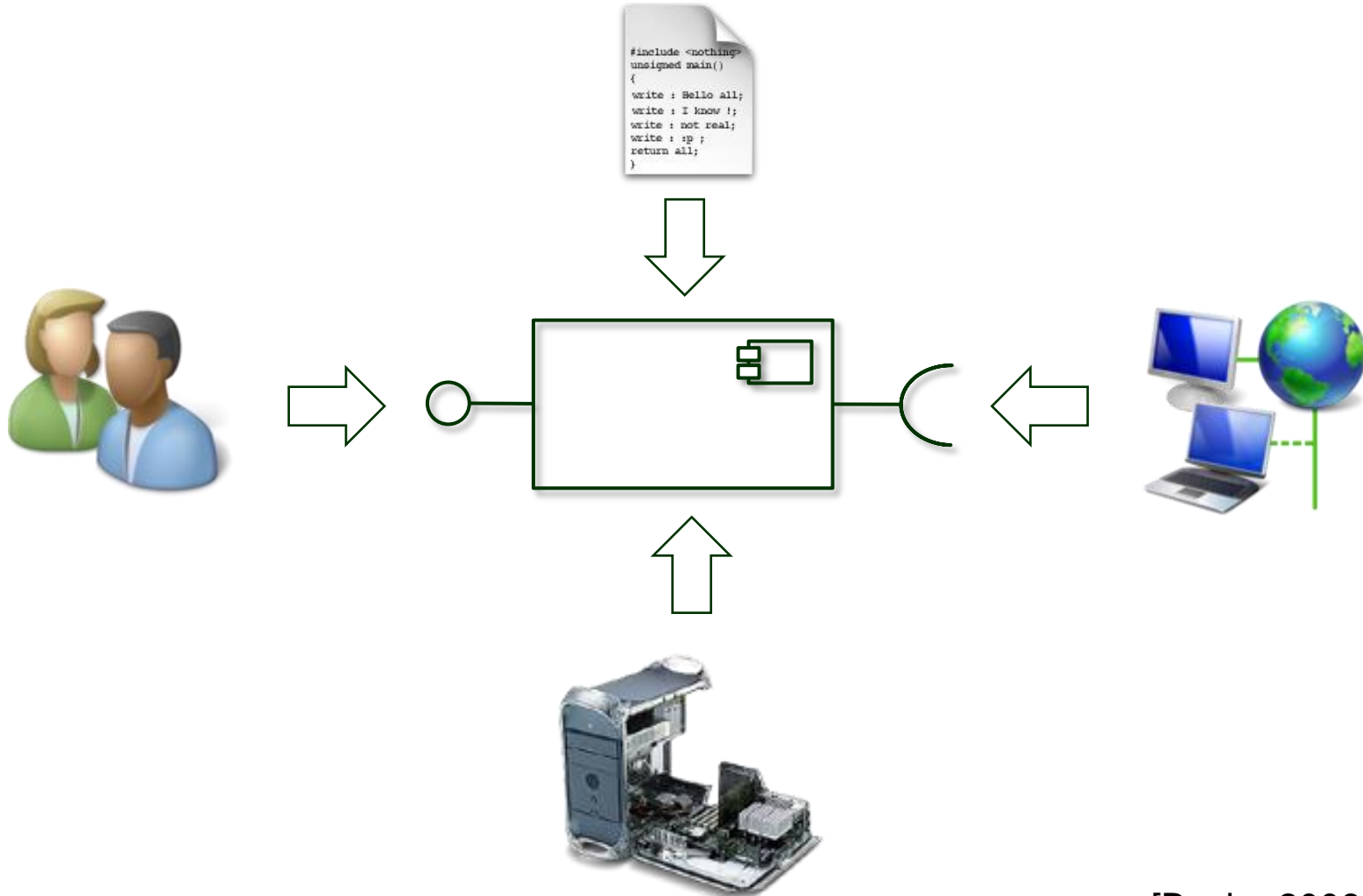
# Idea

- Prediction of quality properties on a model base
  - for systematic design of software systems
  - performance, reliability, ...



- Derive performance metrics from the models using
  - simulation
  - analytical techniques

# Component Performance



[Becker2006a]

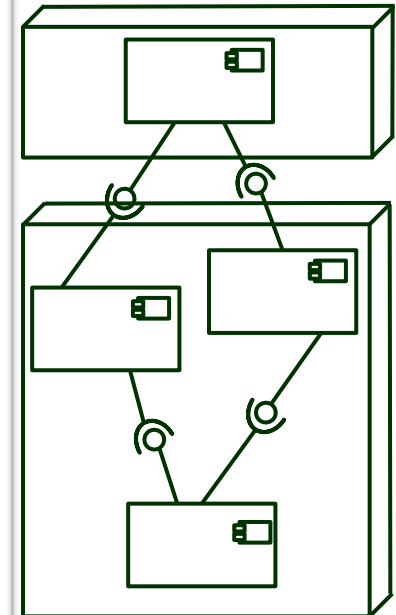
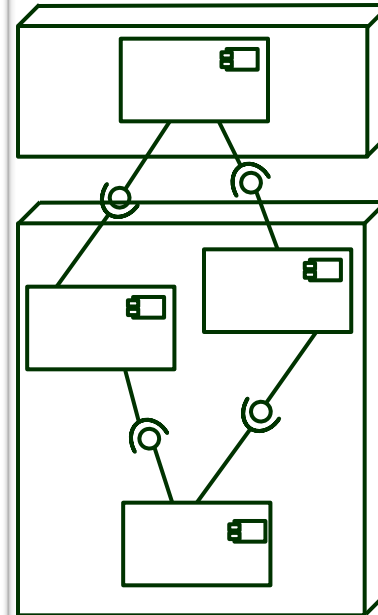
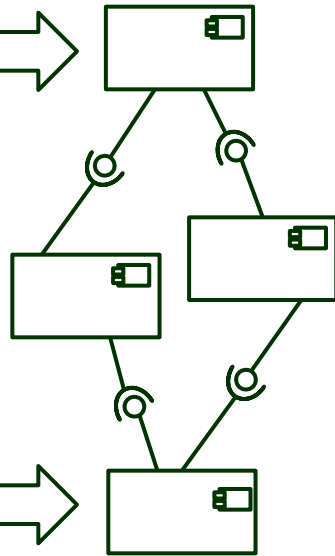
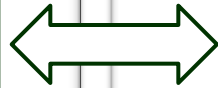
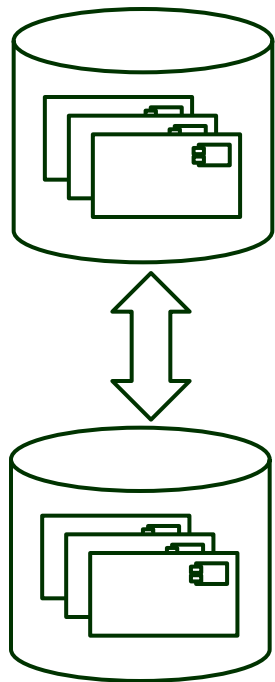


Component  
Developers

Software  
Architect

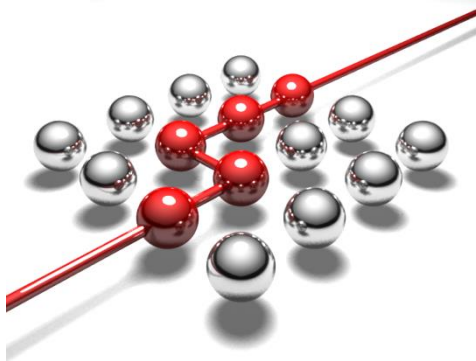
System  
Deployer

Domain  
Expert

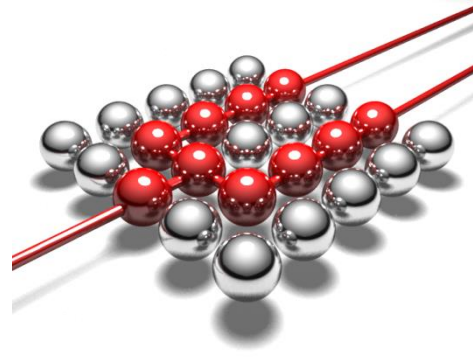


[Becker2007a]

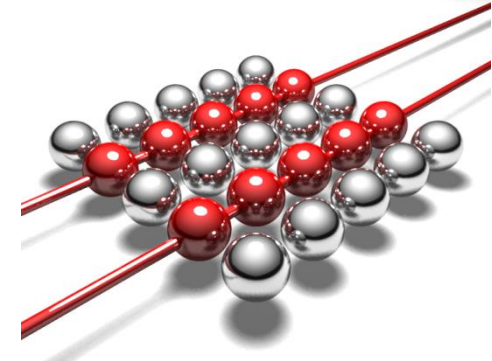
# Application Scenarios



Design Decisions



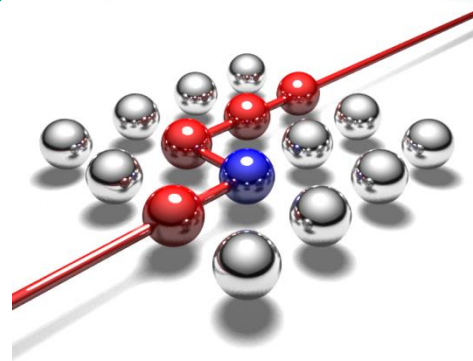
Sizing



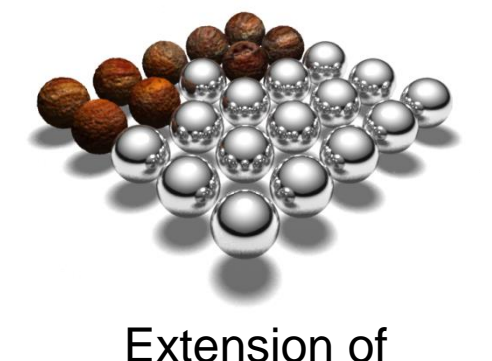
Scaling



Optimal Resource  
Utilization



Optimizing  
Configurations



Extension of  
Legacy Software

# Acceptance



- On page **one** in query after „Palladio“
  - ***Palladio Simulator***
  - *www.palladio-simulator.com/de*
- Query after „Palladio Component Model“ yields approx. 16.200 (2012: 13000 results, 2011: 11600 results, 2010: 3.830 results)
- Including [http://www.heise.de/software/download/palladio\\_component\\_model\\_bench/6507](http://www.heise.de/software/download/palladio_component_model_bench/6507)
- Google scholar: two publications on Palladio with 448 citations, (2013: 295, 2012: 211 citations, 2011: 150 citations) and one with 185 (2013: 130 citations , 2012: 107 citations 2011: 95 citations, 2010: 79 citations each).

# Current Trends



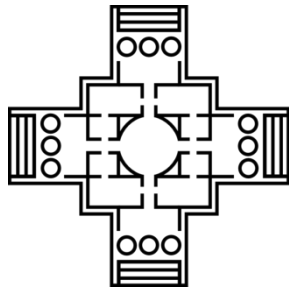
- Extension to energy prediction (fortiss, FZI)
- Meta-Model refactoring (KIT)
- Traceability to requirements and design decisions (KIT)
- Repository of recurring design decisions (KIT)
- Stronger linkage between code and architectures (KIT)
- Analysis of Scalability, Elasticity and Efficiency (TUC)
- Detection of scalability anti patterns (TUC)
- New analysis framework with explicit metrics and typed measurements (TUC)
- Reuse of architectural knowledge (Architectural Templates) (TUC)



# The Crew at KIT and FZI







# Palladio

The Quality Software People.

[www.palladio-simulator.com](http://www.palladio-simulator.com)

