Karlsruhe Institute of Technology

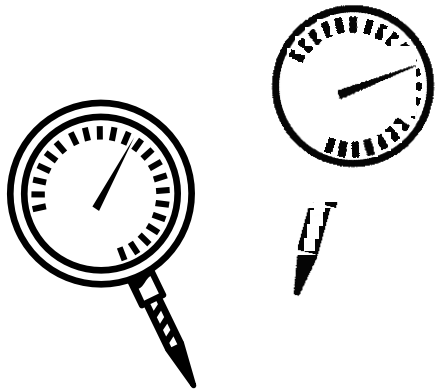
Software Design and Quality

AIM: Adaptive Instrumentation and Monitoring

SPEC RG – WG DevOps
10.10.2014

Alexander Wert

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



Yet Another Monitoring Tool?

DiSL

Kieker

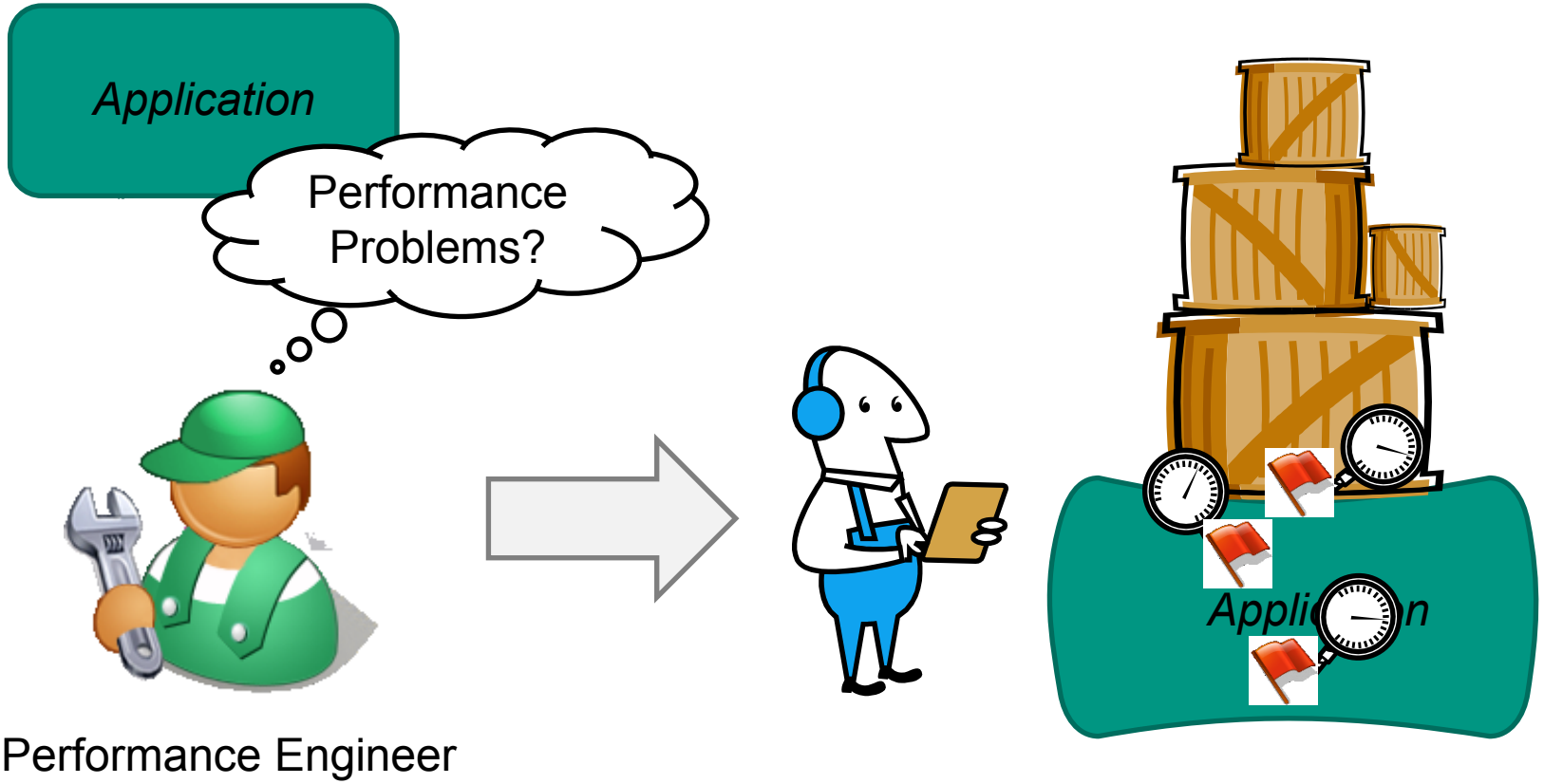
. . .

Why yet another?

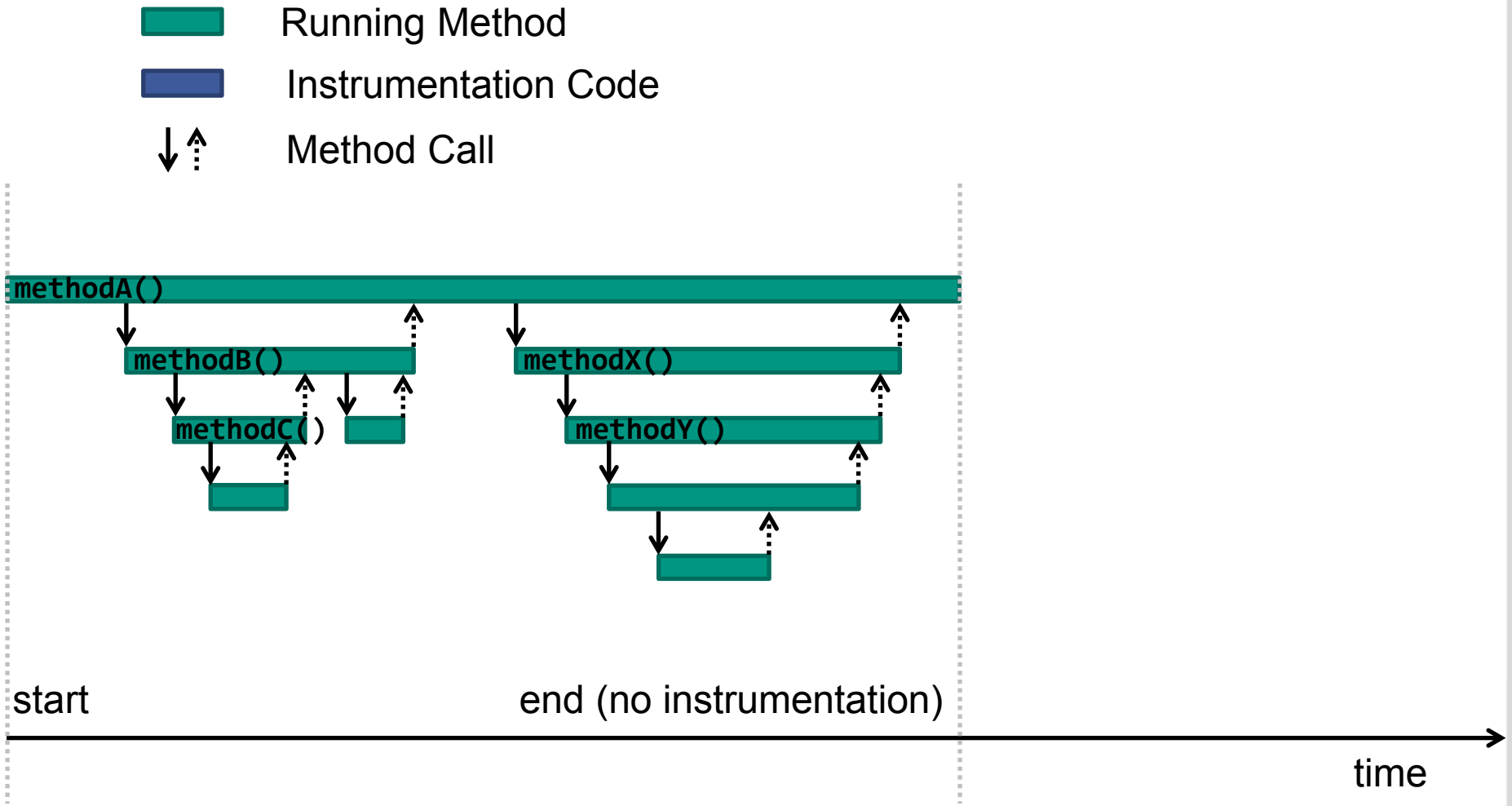
Adaptability of Instrumentation

Instrumentation Description

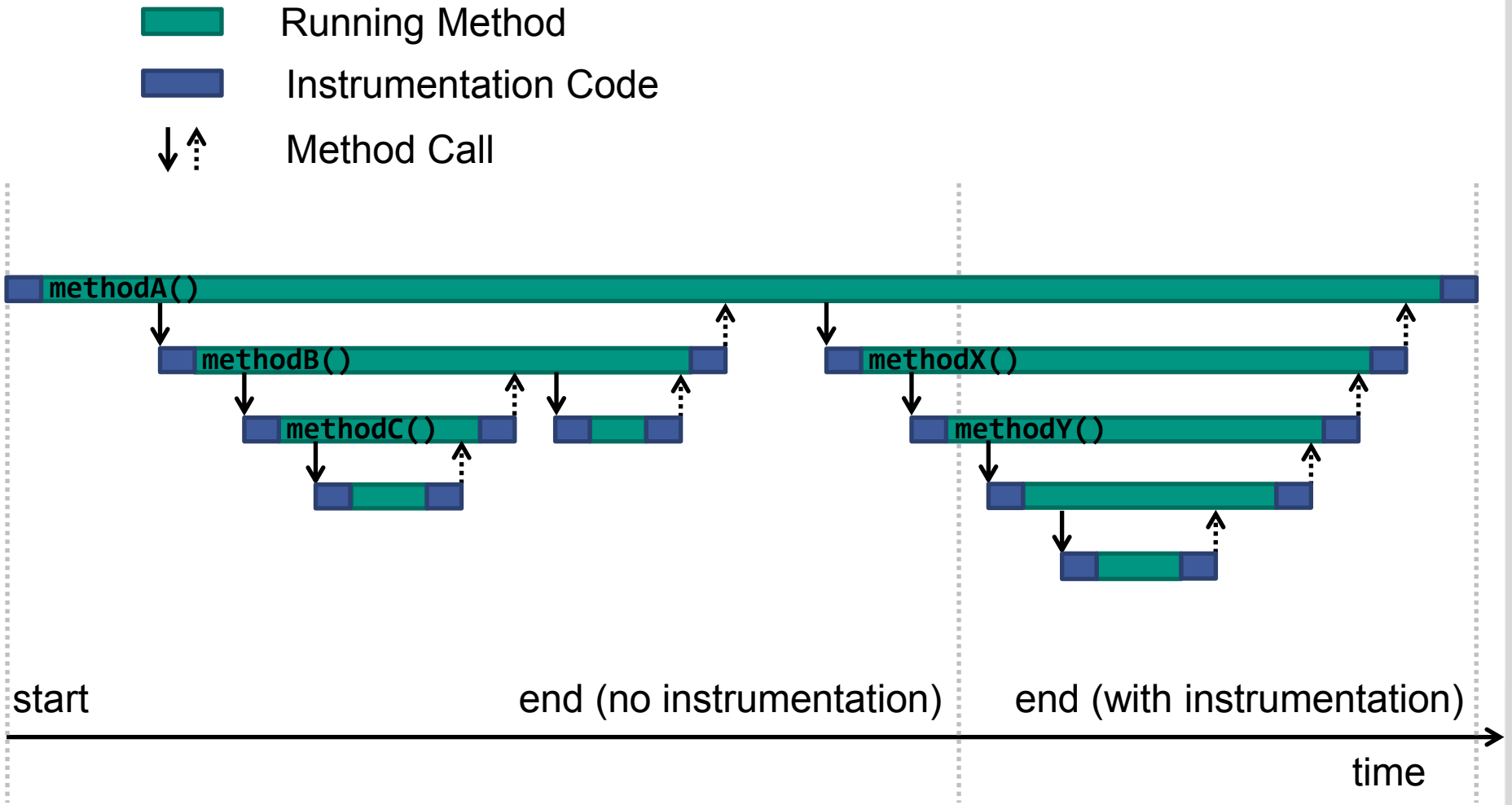
Example Use Case



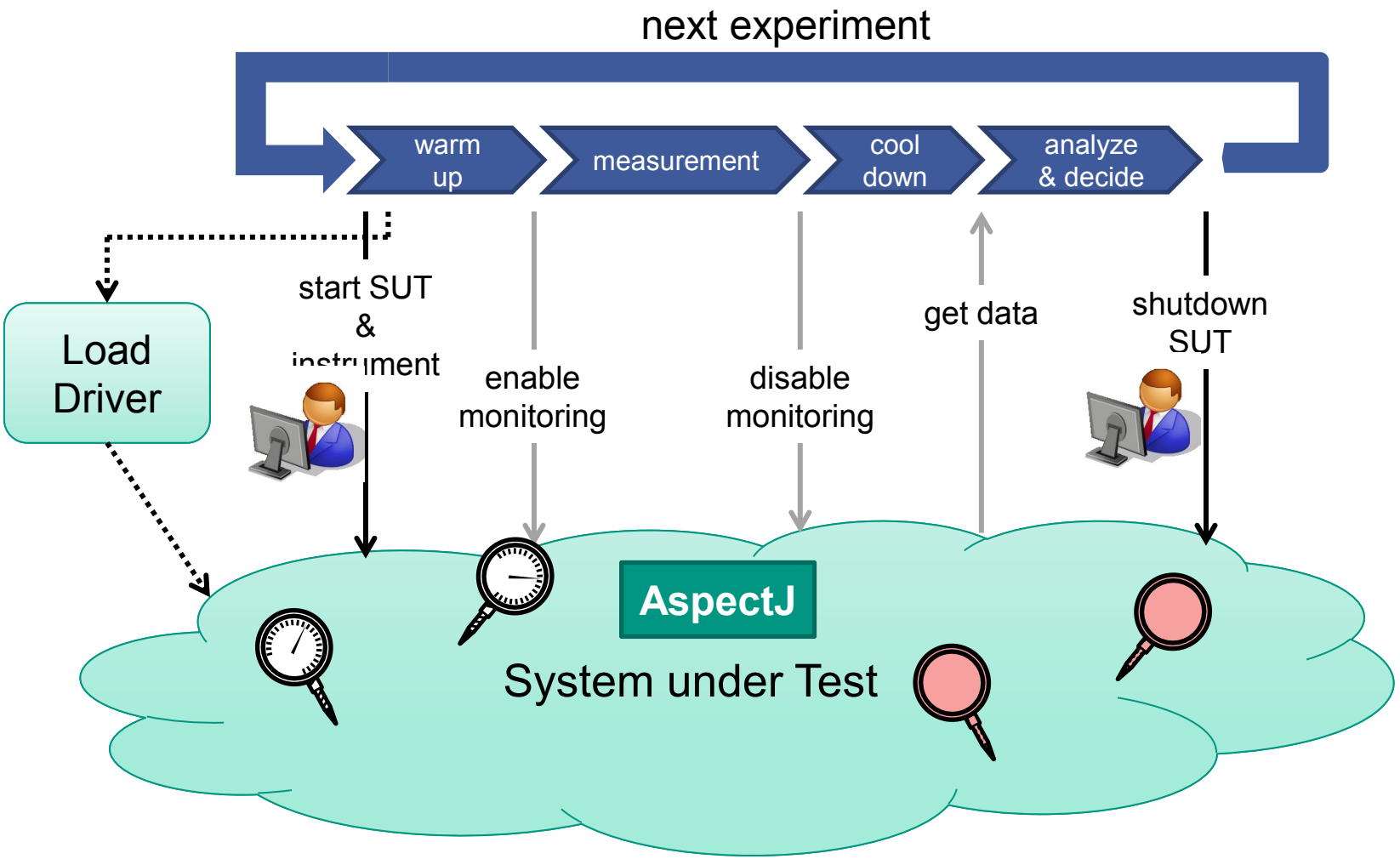
Method Instrumentation



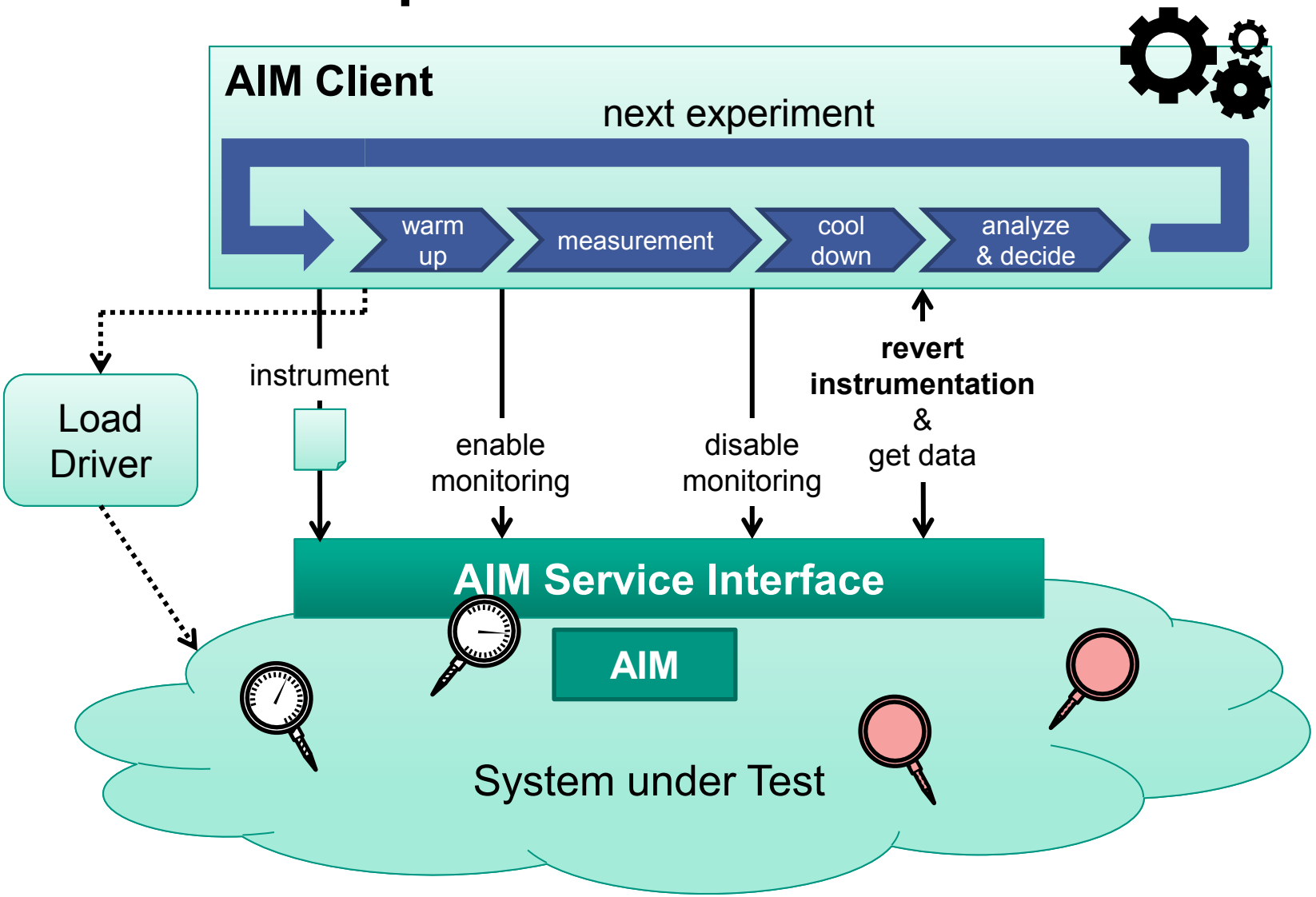
Method Instrumentation



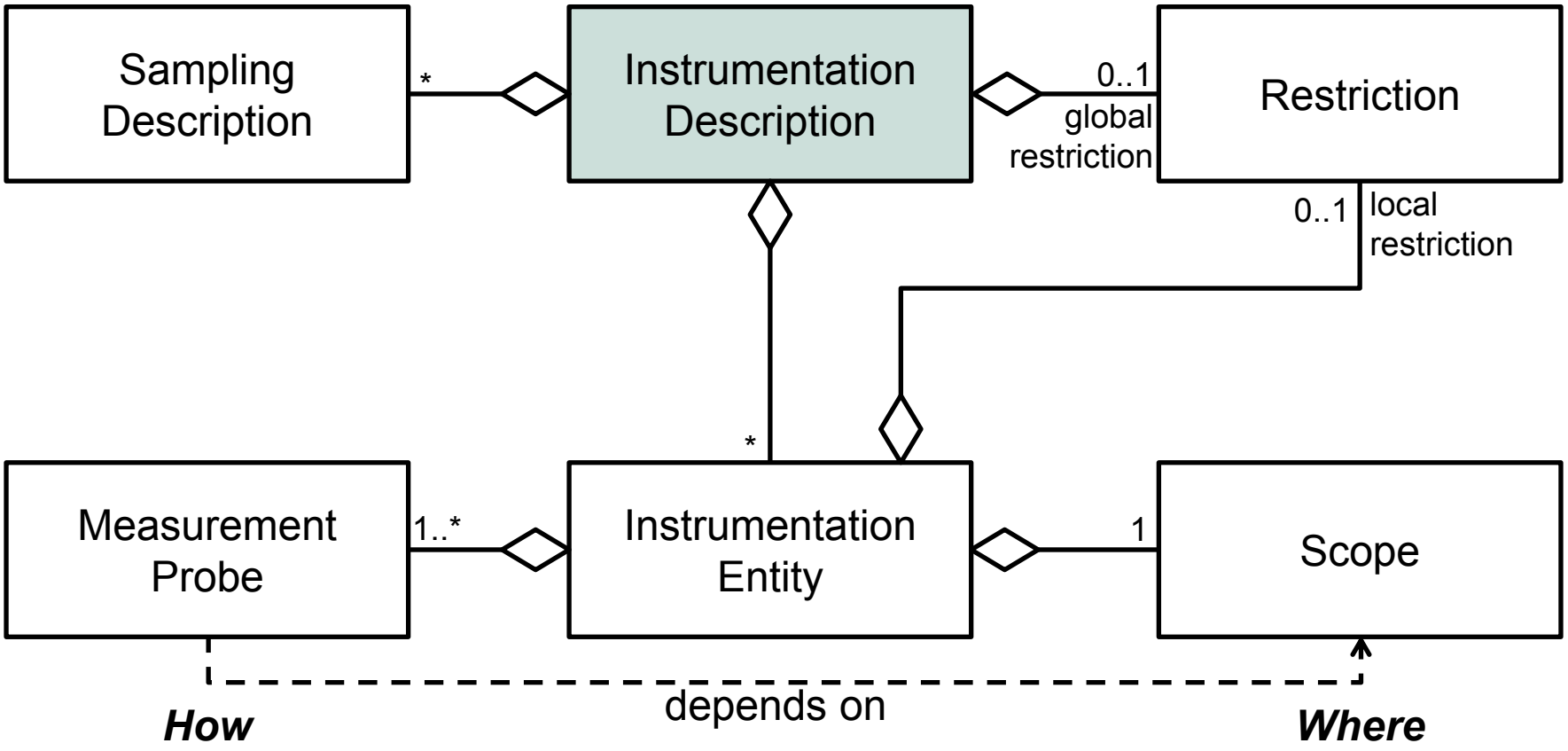
Experimentation



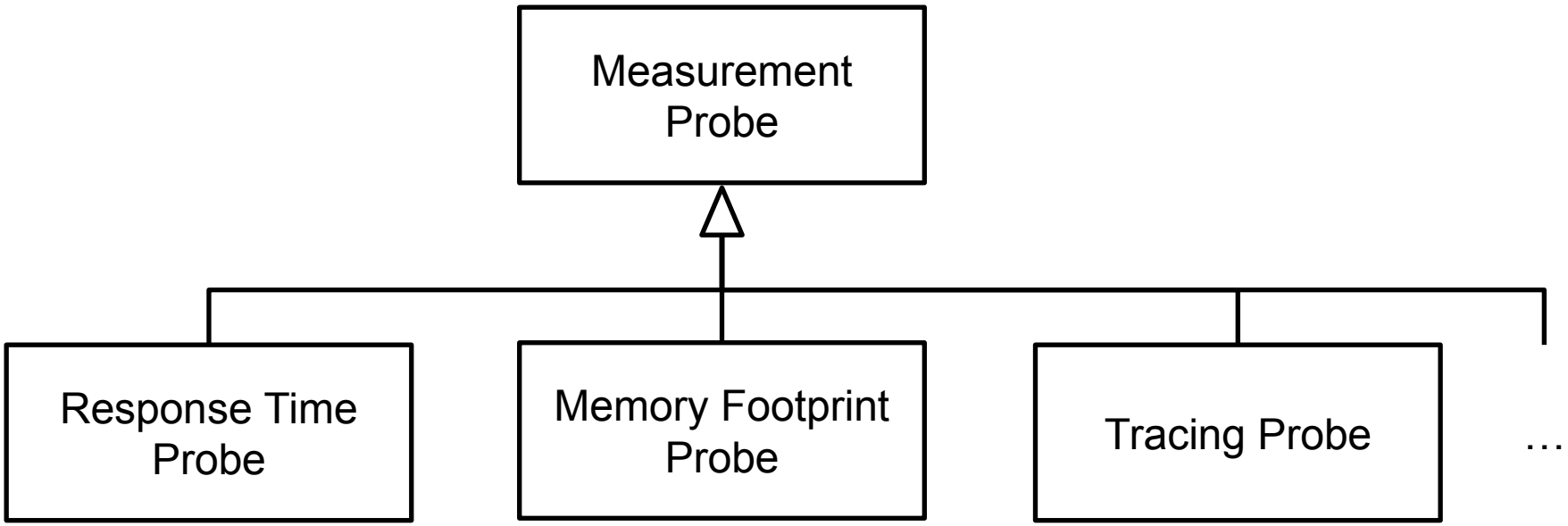
Automatic Experimentation with AIM



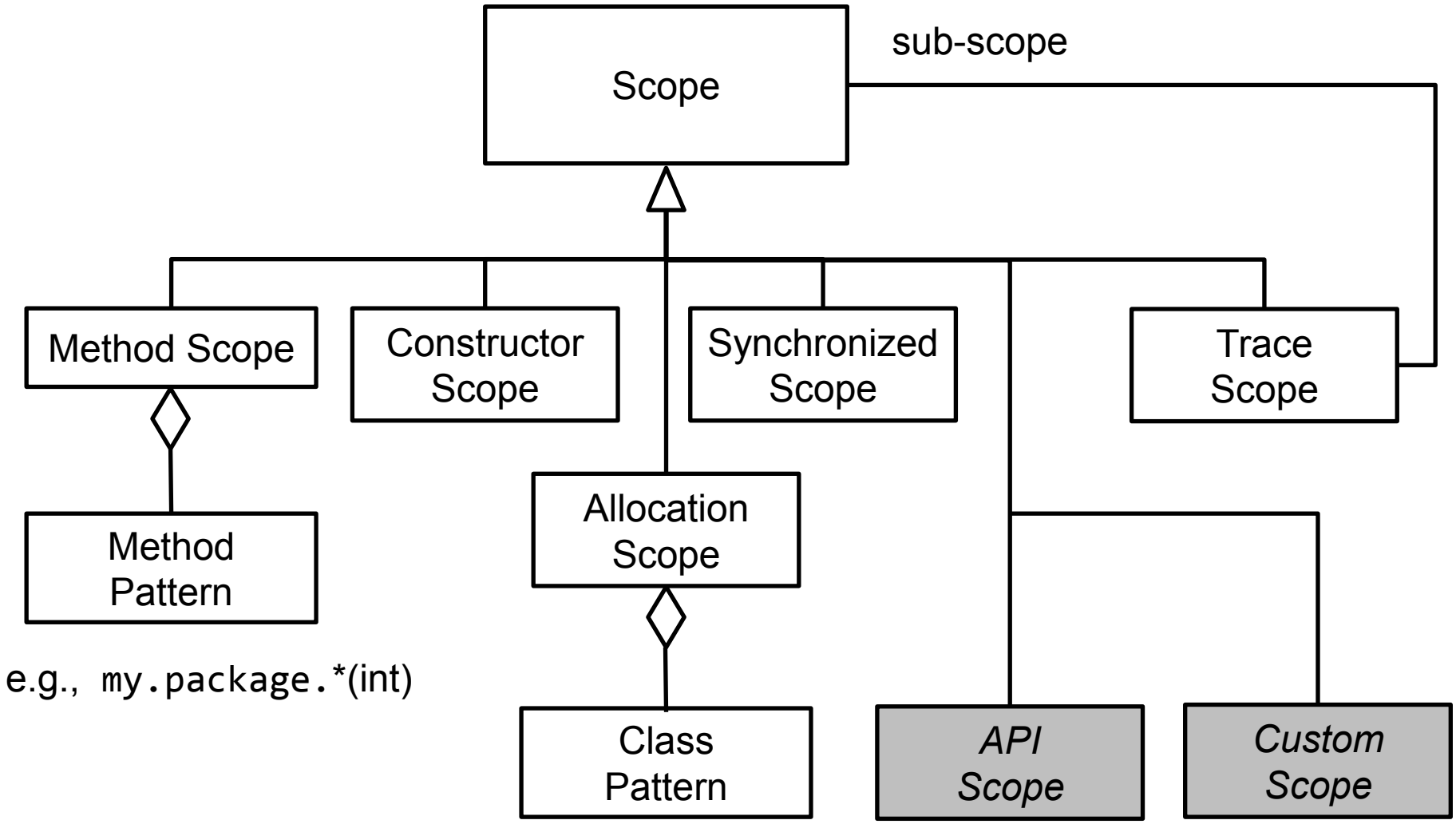
Instrumentation Description Model (IDM)



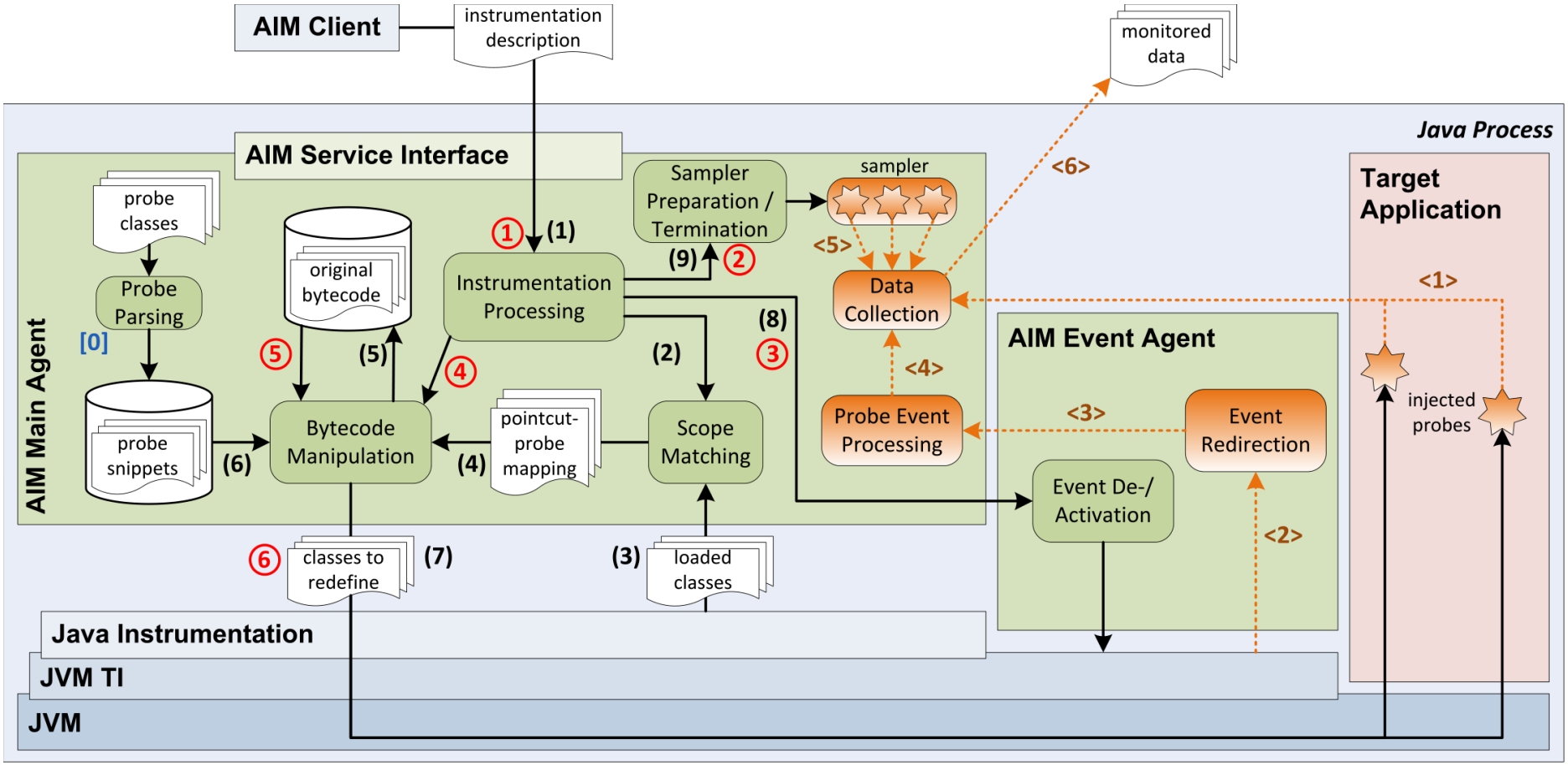
Measurement Probes



Scopes


Scope
sub-scope
Method Scope
Constructor Scope
Synchronized Scope
Trace Scope
Method Pattern
Allocation Scope
e.g., my.package.*(int)
Class Pattern
API Scope
Custom Scope

AIM – Architecture & Process

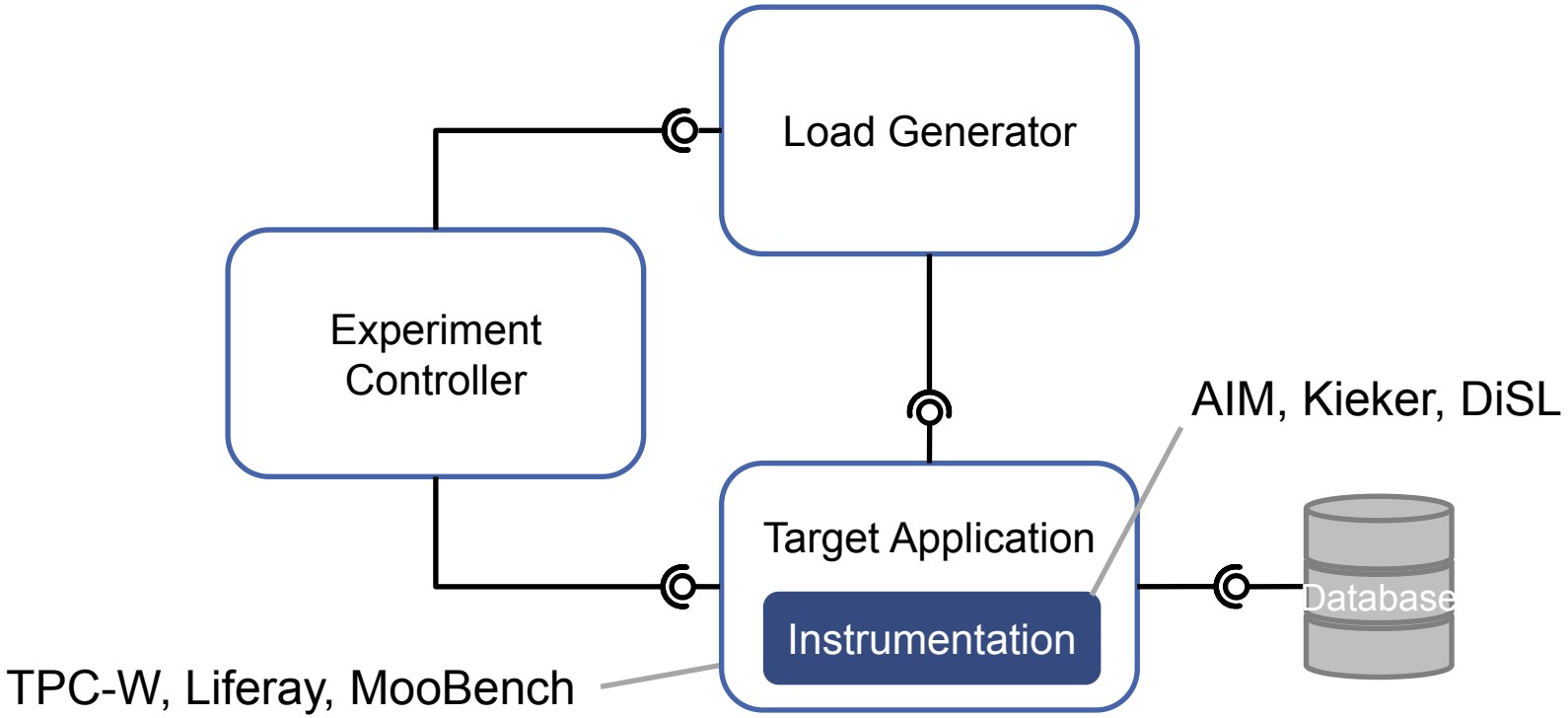


Evaluation Setup – Duration & Overhead

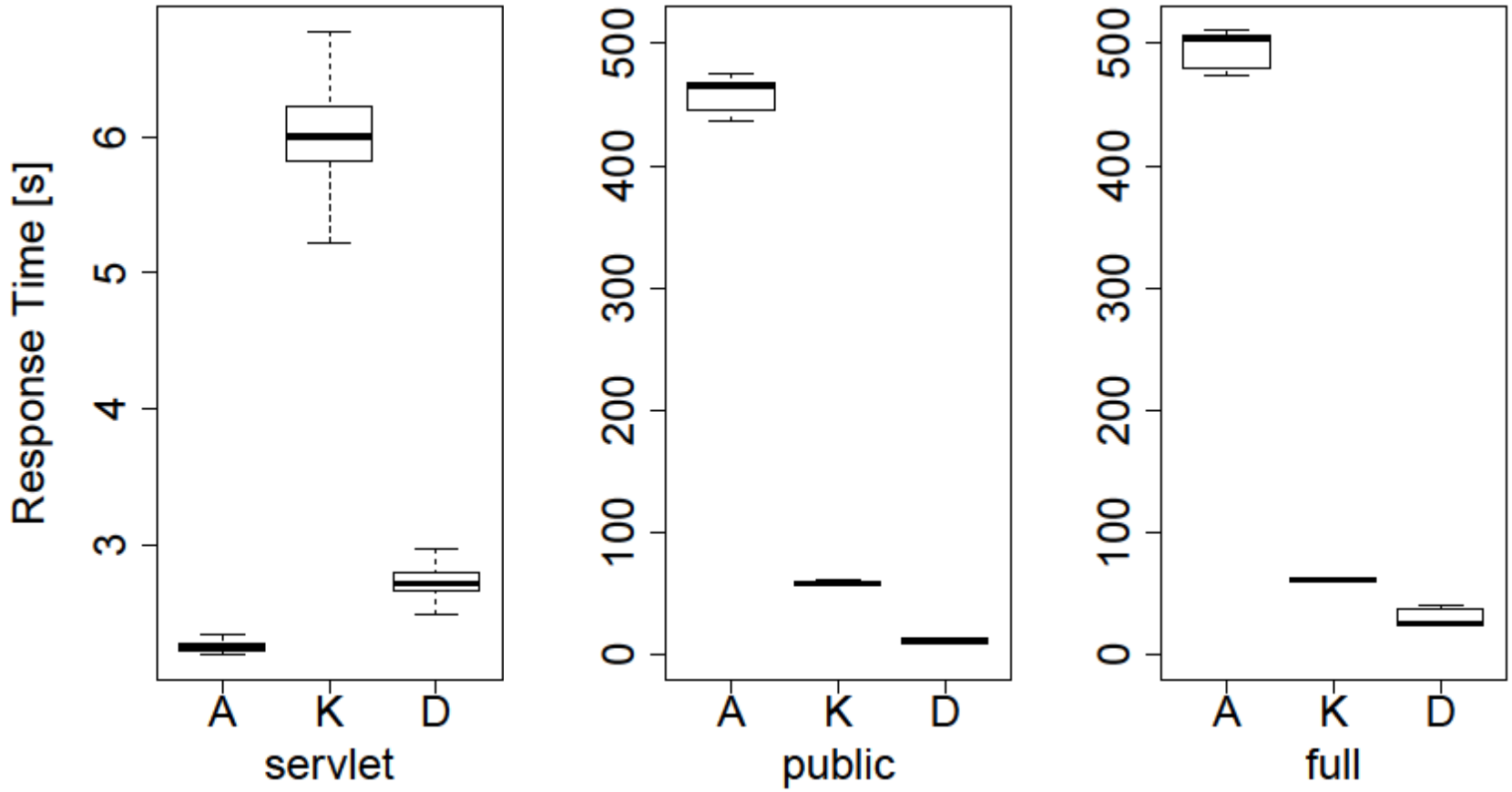
RQ1: How long will AIM take to instrument a system?

RQ2: How big is the performance overhead introduced by AIM?

RQ3: Are there advantages of an adaptive instrumentation approach?

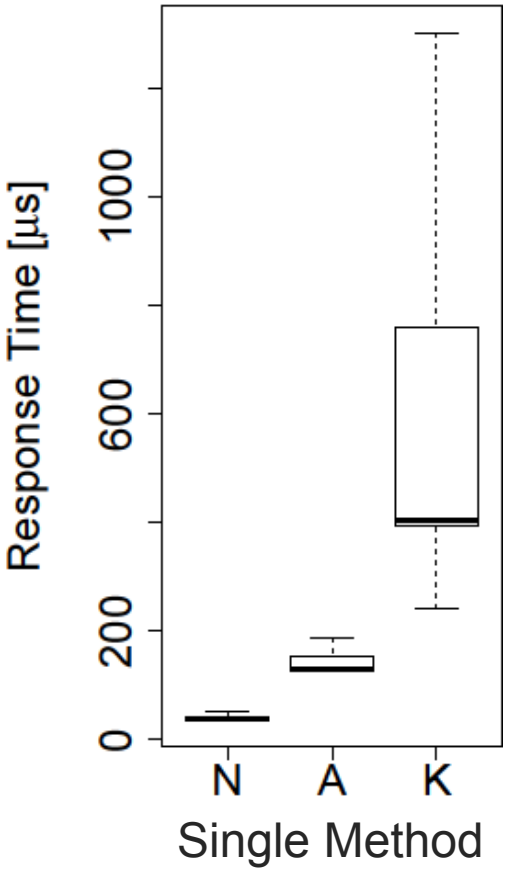


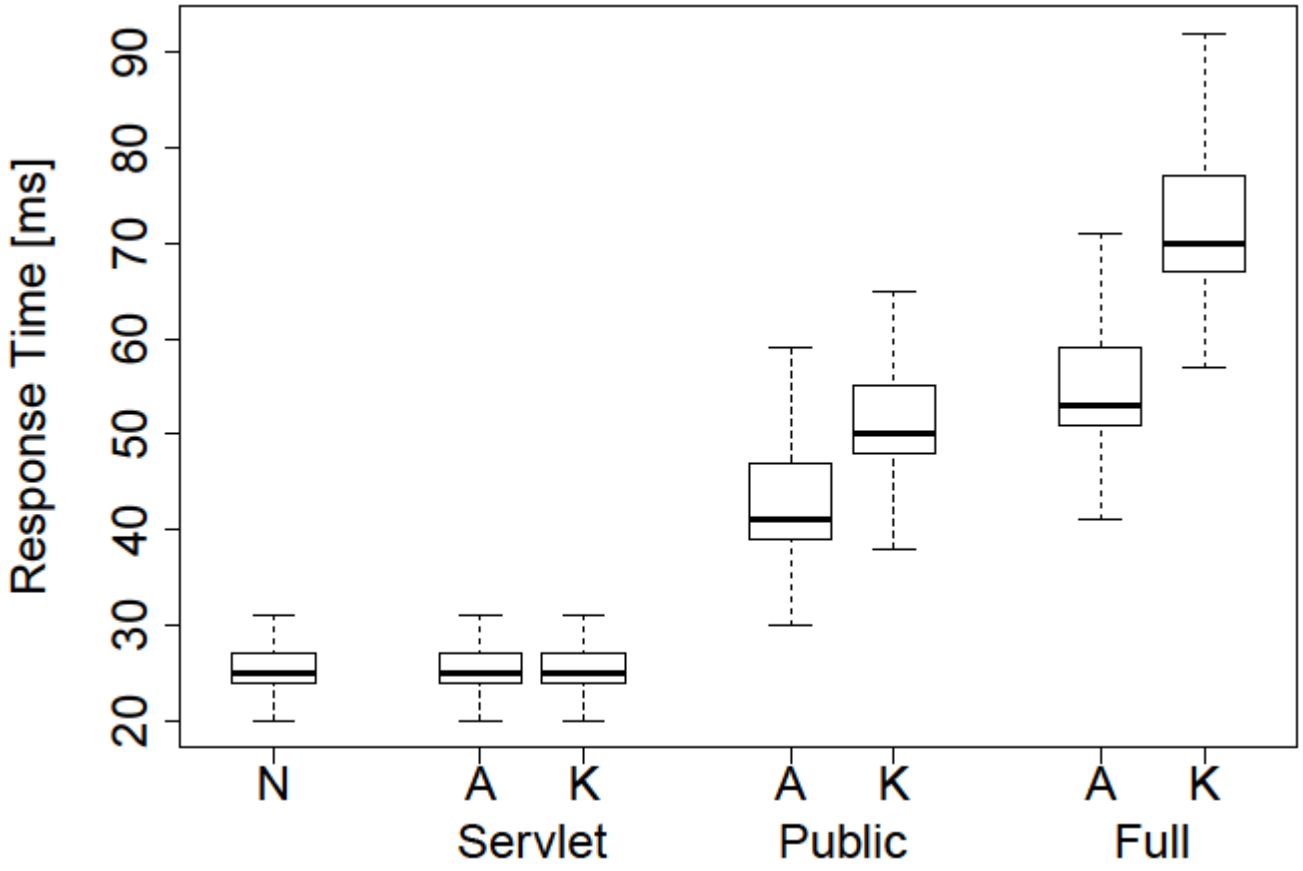
Results – Duration (Liferay)



A: Instr. with AIM **K**: Instr. with Kieker **D**: Instr. With DiSL

Results – Overhead (MooBench & TPC-W)





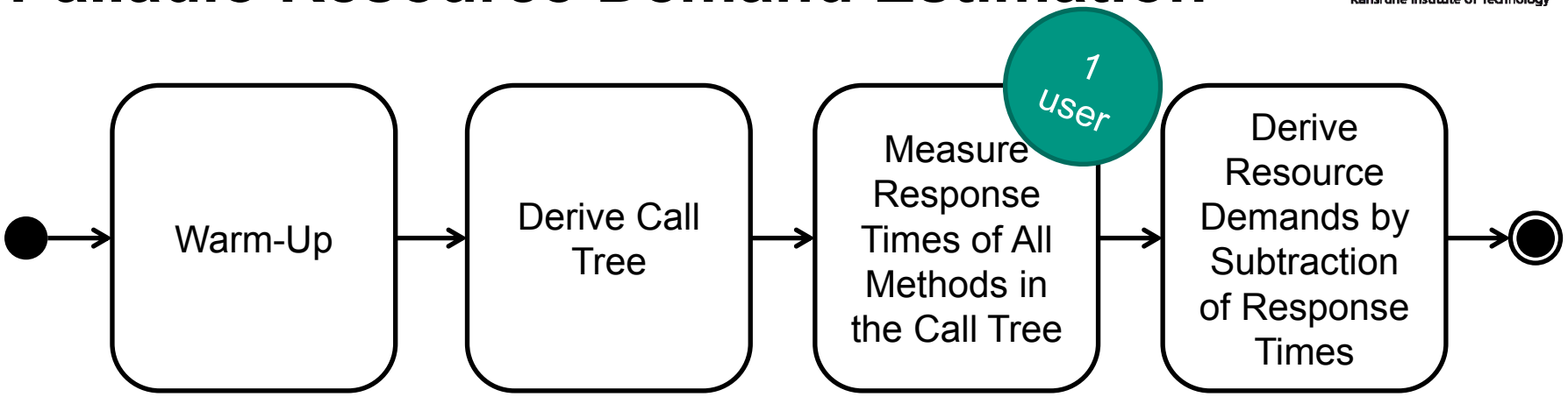
N: No Instr. **A**: Instr. with AIM **K**: Instr. with Kieker

Palladio Resource Demand Estimation

TPC-W Deployment

Palladio Model of TPC-W

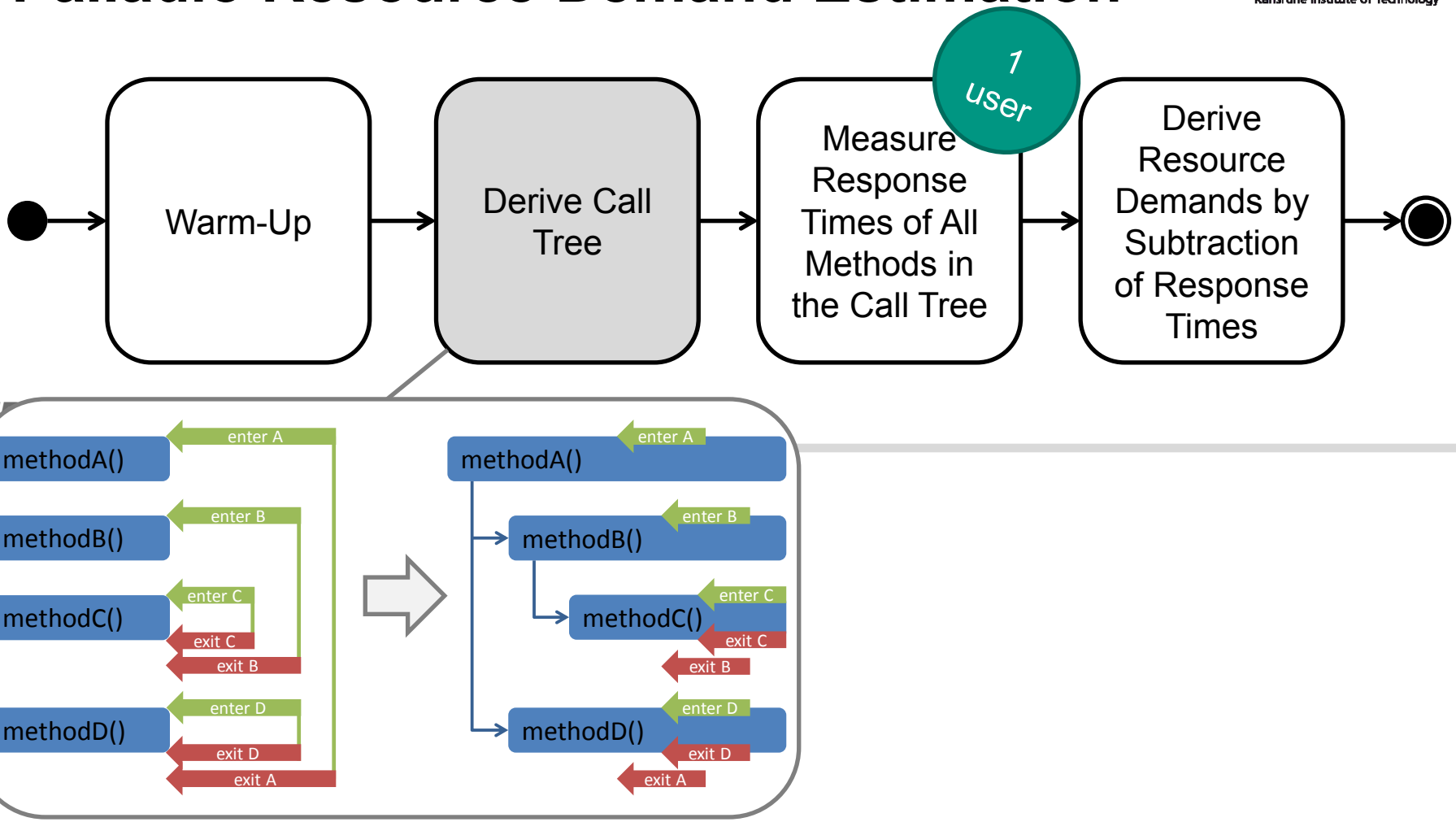
Palladio Resource Demand Estimation



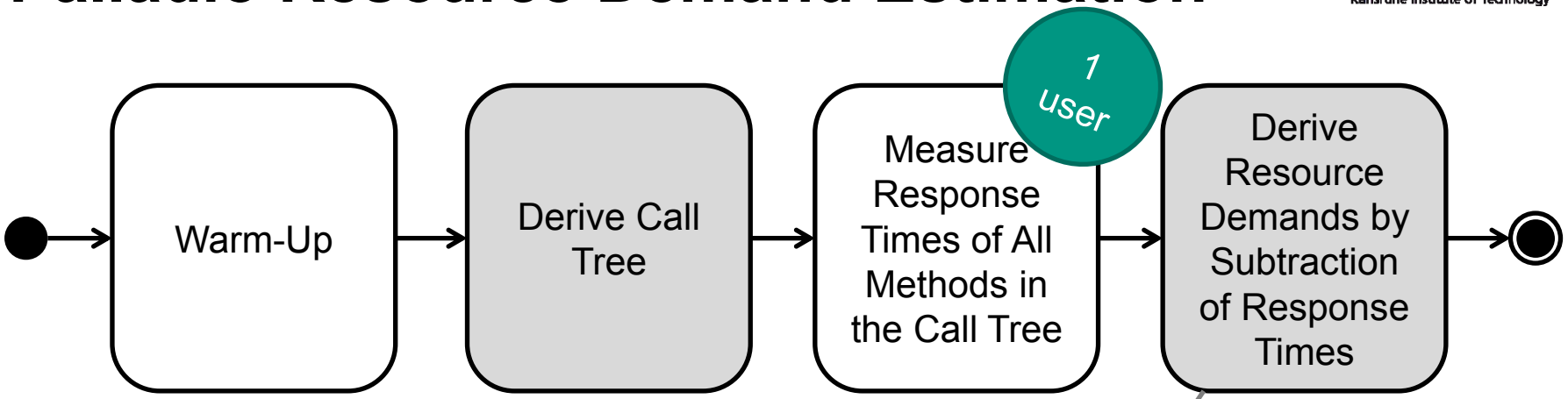
TPC-W Deployment

Palladio Model of TPC-W

Palladio Resource Demand Estimation

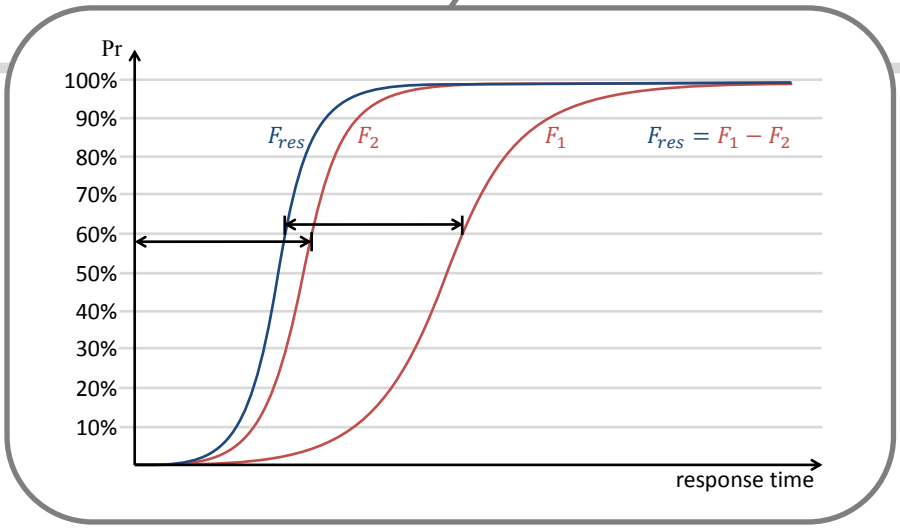


Palladio Resource Demand Estimation

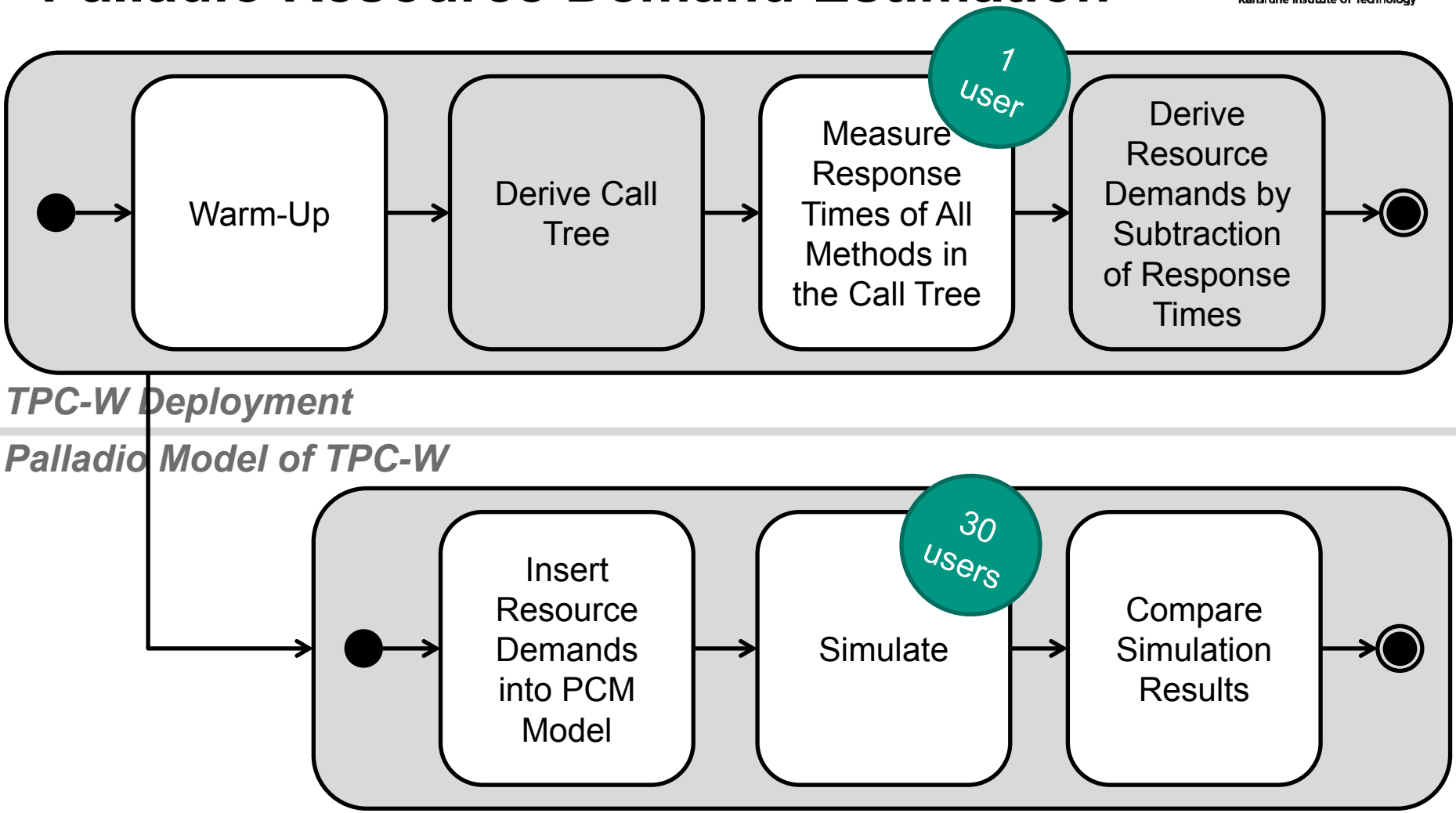


TPC-W Deployment

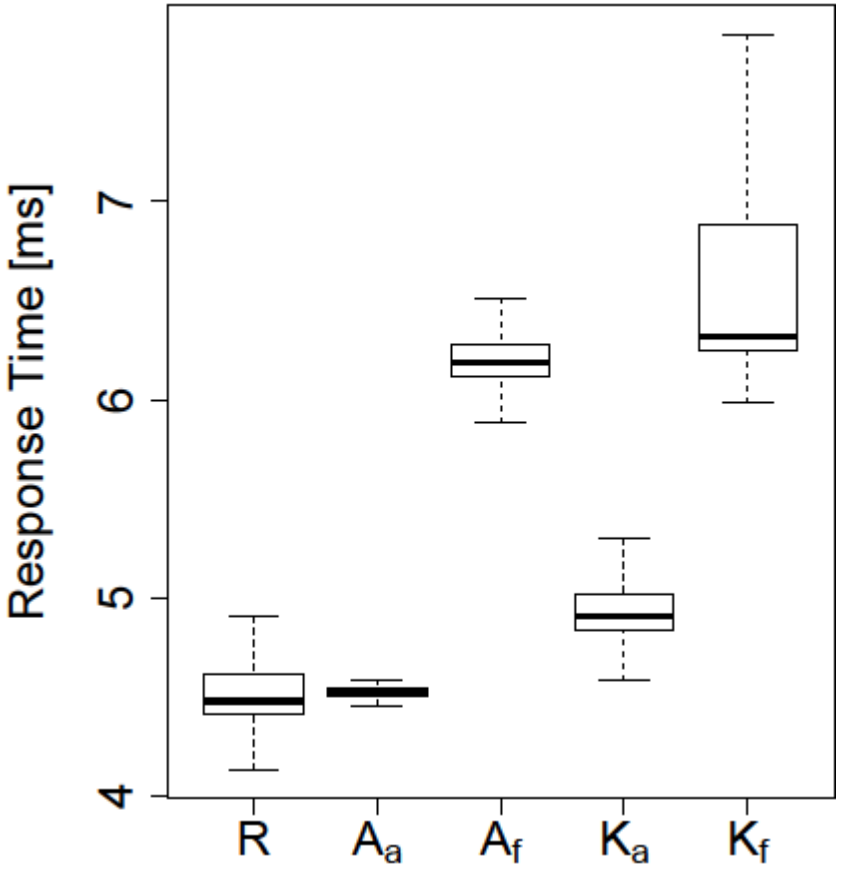
Palladio Model of TPC-W



Palladio Resource Demand Estimation



Comparing PRD Qualities



	mean [ms]	mean error [%]
Reference	4.52	-
AIM (adaptive)	4.52	0.01
AIM (full)	6.21	37.3
Kieker (adaptive)	4.95	9.4
Kieker (full)	6.57	45.4

R: Reference **A_a**: AIM adaptive **A_f**: AIM full **K_a**: Kieker adaptive **K_f**: Kieker full

Future Work

Evaluation of AIM

- Overhead of other probes
- Impact of changing instrumentations under load

Cooperation with Kieker Team

- Embedding AIM into the Kieker framework

Demo

- http://sopeco.github.io/AIM/
- Demo …