Motivation
Motivation
Motivation
Motivation
Motivation
Motivation
Motivation
Motivation
Motivation

What is the response time of some service?
Motivation

What is the response time of some service?

What would be the performance impact of adding a new component or upgrading an existing component as services and applications evolve?
Motivation

What is the response time of some service?

What would be the effect of migrating a service or an application component from one physical server to another?

What would be the performance impact of adding a new component or upgrading an existing component as services and applications evolve?
Motivation

What is the response time of some service?

What would be the effect of migrating a service or an application component from one physical server to another?

What is the utilization of some resource (CPU, memory)?

What would be the performance impact of adding a new component or upgrading an existing component as services and applications evolve?
Motivation
Motivation
Motivation
Motivation
Motivation

1Walter et al. Asking "What?", Automating the "How?": The Vision of Declarative Performance Engineering (ICPE 2016)
Motivation

1Walter et al. Asking "What?", Automating the "How": The Vision of Declarative Performance Engineering (ICPE 2016)
Declarative Performance Engineering
Declarative Performance Engineering

- DPE provides:
  - High-level language for specifying goals and queries independent of the solution approach (Descartes Query Language – DQL)
  - Decision support for selecting appropriate technique and tool for answering the query
  - Adapters for different approaches
Declarative Performance Engineering

• DPE provides:
  • High-level language for specifying goals and queries independent of the solution approach (Descartes Query Language – DQL)
  • Decision support for selecting appropriate technique and tool for answering the query
  • Adapters for different approaches
• Problem: only model-based approaches are supported
Declarative Performance Engineering

• DPE provides:
  • High-level language for specifying goals and queries independent of the solution approach (Descartes Query Language – DQL)
  • Decision support for selecting appropriate technique and tool for answering the query
  • Adapters for different approaches
• Problem: only model-based approaches are supported
Declarative Performance Engineering

• DPE provides:
  • High-level language for specifying goals and queries independent of the solution approach (Descartes Query Language – DQL)
  • Decision support for selecting appropriate technique and tool for answering the query
  • Adapters for different approaches
• Problem: only model-based approaches are supported
Declarative Performance Engineering

• DPE provides:
  • High-level language for specifying goals and queries independent of the solution approach (Descartes Query Language – DQL)
  • Decision support for selecting appropriate technique and tool for answering the query
  • Adapters for different approaches
• Problem: only model-based approaches are supported
Declarative Performance Engineering

- DPE provides:
  - High-level language for specifying goals and queries independent of the solution approach (Descartes Query Language – DQL)
  - Decision support for selecting appropriate technique and tool for answering the query
  - Adapters for different approaches
- Problem: only model-based approaches are supported
Declarative Performance Engineering

- DPE provides:
  - High-level language for specifying goals and queries independent of the solution approach (Descartes Query Language – DQL)
  - Decision support for selecting appropriate technique and tool for answering the query
  - Adapters for different approaches
- Problem: only model-based approaches are supported
Declarative Performance Engineering

• DPE provides:
  • High-level language for specifying goals and queries independent of the solution approach (Descartes Query Language – DQL)
  • Decision support for selecting appropriate technique and tool for answering the query
  • Adapters for different approaches
• Problem: only model-based approaches are supported
Adapter design

DQL Framework

submit query

receive & answer queries

Filter Module

provides parsed query

Config Generation Module

pipe-and-filter for filtering
takes logs

Kieker Analysis

configures and starts

Kieker Monitoring

Kieker framework
Adapter design

DQL Framework

submit query

receive & answer queries

Filter Module

provides parsed query

directly to Kieker4DQL

takes logs

pipe-and-filter for filtering

Config Generation Module

configures and starts

Kieker Analysis

Kieker Monitoring

Kieker framework
Adapter design

DQL Framework

submit query

Kieker4DQL

receive & answer queries

Filter Module

provides parsed query

Config Generation Module

pipe-and-filter for filtering

takes logs

Kieker Analysis

configures and starts

Kieker Monitoring
Adapter design – modules

- Configuration module
  - Analyzes DQL query to identify points where instrumentation will be inserted
  - Generates Kieker configuration tailored to DQL query (*aop.xml*)
- Filter module
  - Built using Kieker Analysis component, based on PMX
  - It takes data from the log and builds DQL data structures
  - If the change in instrumentation is not possible, it can work with available data
Questions:

• Does it work?
• What about overhead?

JPetStore

Sample queries

```
SELECT res1.utilization
FOR RESOURCE 'cpu1' AS res1
USING kieker@'dql.properties';

SELECT srv1.responseTime
FOR SERVICE 'CatalogActionBean.getItem()' AS srv1
USING kieker@'dql.properties';
```
Evaluation

• Questions:
  • Does it work?
  • What about overhead?

• JPetStore

• Sample queries

  SELECT res1.utilization
  FOR RESOURCE 'cpu1' AS res1
  USING kieker@'dql.properties';

  SELECT srv1.responseTime
  FOR SERVICE 'CatalogActionBean.getItem()' AS srv1
  USING kieker@'dql.properties';

• It works!
• Overhead is reduced owing to the tailored configuration
• Evaluation setup is available on: https://doi.org/10.5281/zenodo.61281
Conclusion

• Unified interface to both model- and measurement-based approaches
• Future work
  • Improving generation of monitoring configuration
  • Extending to other APM tools
  • OPEN.xtrace¹

Questions?