Enabling Assembly of Systems and its Implications within the Palladio Component Model

Symposium on Software Performance: Joint Descartes/Kieker/Palladio Days 2014
Misha Strittmatter
Foundations
Foundations

Introduction

Impact on Submodels

Metamodel Change

Conclusion

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Institute for Program Structures and Data Organization
Problem

- PCMs original focus: systems and their internals
- No system assembly
- Simulating system interactions
  - Modeling hacks
  - QoS annotations
- Hinders applicability in new fields
Idea & Benefits

- Relatively small metamodel change
  - Its core: make system a repository element
- Enables system assembly
  - Performance and reliability predictions “for free”
  - Modelling of system landscapes / systems-of-systems
    - EAM, SmartGrid, …
System / Composed Structure Model

Introduction  ❯  Impact on Submodels  ❯  Metamodel Change  ❯  Conclusion

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Repository Model

Introduction  ➞  Impact on Submodels  ➞  Metamodel Change  ➞  Conclusion
**Allocation Model**

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**Introduction**

**Impact on Submodels**

**Metamodel Change**

**Conclusion**

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Usage Model

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Software Design and Quality Group
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Metamodel

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Metamodel

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[Diagram of Metamodel]

Metamodel Change

Introduction

Impact on Submodels

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Metamodel Change Alternative 1

Impact on Submodels

Metamodel Change

Conclusion
Metamodel Change Alternative 2

(Usage Model & QoS Annotations)
Discussion

- Impact on solvers small?
  - Mitigate effort by modifying in conjunction with major refactoring

- System definition in repository
  - Role model?

- Usage can aim at components & subsystems
  - Already possible, but currently prohibited
  - But formalism still useful, but has different meaning

- Systems and/or subsystems
- RepositoryComponent
Summary

- Relatively small metamodel change
  - Its core: make system a repository element
- Enables system assembly
  - Performance and reliability predictions “for free”
  - Modelling of system landscapes / systems-of-systems
    - EAM, SmartGrid, …