Vrije Universiteit Brussel



## Introduction

- Grid computing has been gaining importance
- Traditional application domain: science
- Recent challenge: use of grid technology beyo science, for production and design in industrial settin
- Since 2002: standardization effort for grid (OGSA)
- New standard: grid services, based on web services
- Services standardized, but composition still open iss
- Services mostly composed using general-purpose language
- Workflow languages (e.g. WS-BPEL) are better suite

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Based on: Niels Joncheere and Wim Vanderperren. Requirements for an aspect-oriented workflow system for grid services. In SPLAT Workshop at the 5th International Conference on Aspect-Oriented Software Development (AOSD 2006), Bonn, Germany, March 2006. Advisors: Viviane Jonckers and Wim Vanderperren

## An Aspect-oriented Workflow System for Grid Services

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ssue	Problem Statement
ges ed	<ul> <li>No workflow languages tailored for grid servi</li> <li>Problems with workflow languages for web set</li> <li>Expressive but complicated</li> <li>Not suited for high-performance com</li> <li>Insufficient support for separation of</li> <li>Insufficient support for dynamic adaptation</li> </ul>
	<ul> <li>Goal of research: design and implement system specifically aimed at grid services</li> </ul>
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	Approach
	<ul> <li>Design new workflow system, focusing on:</li> <li>Modularization         <ul> <li>of crosscutting concerns (using AOSD)</li> <li>of non-crosscutting concerns (using subprocesses)</li> </ul> </li> </ul>
vices	<ul> <li>Dynamism</li> <li>High-performance computing</li> <li>Semantics</li> </ul>
services:	<ul> <li>Implement proof-of-concept</li> </ul>
nputing f concerns	<ul> <li>Validate workflow system (i.c.w. industrial partner)</li> </ul>
workflow	<ul> <li>Generalize results (e.g. to web services)</li> </ul>
workflow	
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## AO Properties

- Joinpoint model:
  - Basic workflow activities (e.g. invocations, assignments), i.e. not only points of interaction
- Pointcut language:
  - Selection based on properties of workflow activities
- Advice language:
  - Advices expressed using basic workflow language
- Aspect modules:
  - Similar to subprocesses
- Aspect composition:
  - All relations between aspects must be specified in advance