Provenance Models of Complex Workflows

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Outline

1. Provenance workflows
2. What-if analysis in provenance workflows
3. Debugging in provenance Workflows
4. Relation of what-if analysis with debugging
Scientific workflows illustrate the experimental steps taken to produce the scientific papers.

Provenance workflow graphs capture a complete description of evaluation of a workflow.

They are crucial for scientific workflows to support reproducibility, debugging and result comprehension.

They should also be considered critical for complex workflows of sophisticated events with asynchronous, triggered behaviors.
What-if analysis in provenance workflows

- There is no support for what-if analysis in the current workflow tools.
- Fast and extensive what-if analysis can be done with little manual effort using the built-in wizards.
- Users will see how the tasks will turn out with the modifications.
- By the help of what-if analysis toolkit, modification process will be less time and effort consuming.
Debugging in provenance Workflows

- It is important to keep the workflow original and errorfree.
- A workflow generating meaningful results can start showing faulty behaviors.
- Responsible data or process nodes for erroneous behavior in workflow systems can be found out.
- The culprit sequences of nodes and edges (correlated with anomalous behavior) can be identified using data fusion techniques.
Relation of what-if analysis with debugging

- What-if analysis toolkit can serve as a tester module for the debugging results.
- It can be analyzed what will happen if the faulty sequences marked bad are replaced by good patterns.
- During what-if analysis, workflow execution may not give the desired result.
- Users can debug their workflows instead of rebuilding the experiment.
Thank you very much