Integrating Model-Driven Development and Software Product Line Engineering

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pure::variants

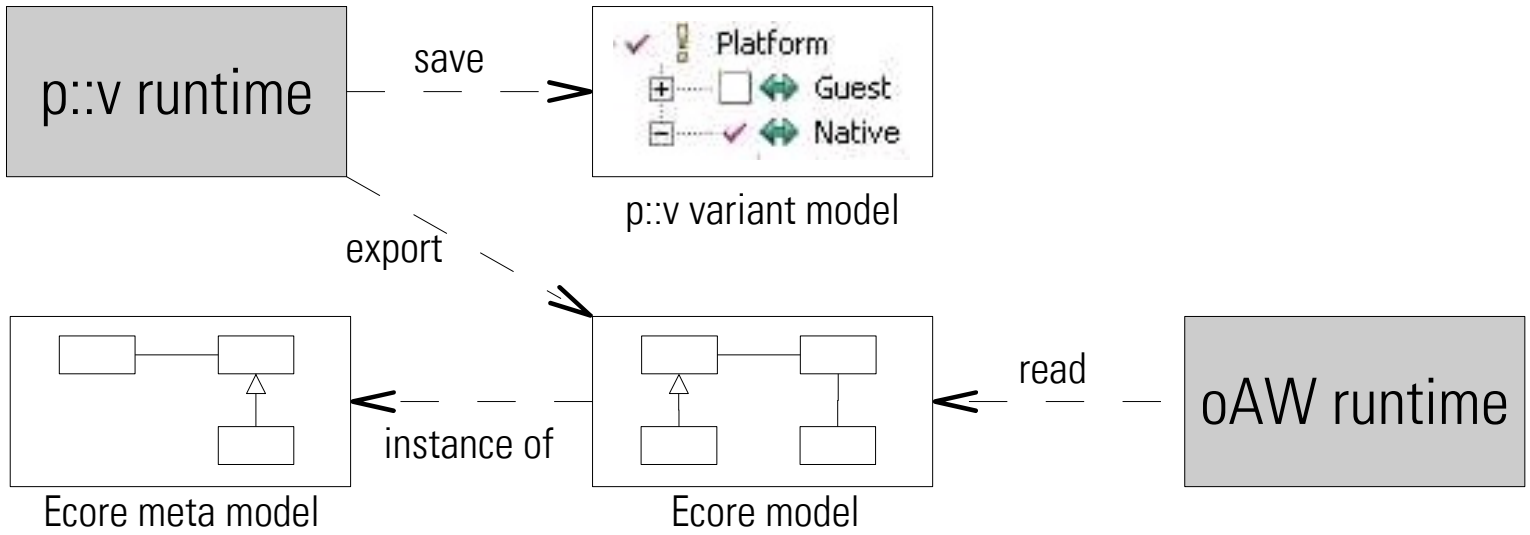
- Variant management tool based on Eclipse
- Variability management with Feature Models
  - Uniform representation of all variabilities and commonalities
  - Features extended by attributes, relations and constraints
  - Validation of feature selections with automatic conflict resolving
- Solution modeling with Family Model
  - classes, objects, functions, variables, documentation, ...
- Transformation engine for automatic product variant generation
- Open interfaces to integrate with other development tools
  - oAW, BIRT, DOORS, MATLAB/SIMULINK, ClearQuest, Bugzilla, ...

openArchitectureWare

- Modular MDA/MDD generator framework
- Models and language family to check and transform models as well as generate code based on them
- Strong support for EMF (Eclipse Modelling Framework)
- Workflow engine allowing the definition of generator & transformation workflows
- Prebuilt workflow components
  - reading and instantiating models
  - checking for constraint violations
  - transforming them into other models
  - generating code

Integrating p::v and oAW

- Ecore used for data transfer
- p::v automatically exports variant information into an Ecore model
- oAW reads the Ecore representation
- Workflow execution, model transformation as well as code generation can be controlled by the feature selection



Integrating p::v and oAW

- Feature selection enables or disables workflow steps

```
<feature exists="logging">
<component adviceTarget="xtendComponent.ps2cbd"
class="oaw.xtend.XtendAdvice">
<extensionAdvices value="logging"/>
</component>
</feature>
```

- Feature attribute used for code variability

```
private create ConfigParameterValue
createParamForLevel( ComponentInstance instance ):
setName( "level" ) ->
setValue((String)getFeatureAttributeValue
                        ( "siren", "level" ));
```

Summary & Future Work

- Adds variability management to model driven development
- Enables model driven development for software product lines
- Only minimal work to connect both tools – shows the power of the eclipse workbench concept

- Complete pure::variants model support
- Improved visualization of feature controlled artefacts
- Navigation from features to references in oAW
- Direct integration of oAW into the pure::variants transformation

Further Information

- http://www.pure-systems.com/pv
- http://www.openarchitectureware.org

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Thank you for your attention !