A Model-Driven Configuration Management System for Advanced IT Service Management

Holger Giese, Andreas Seibel and Thomas Vogel
System Analysis and Modeling Group, Hasso Plattner Institute, University of Potsdam, Germany

1. Motivation
- IT Systems got heterogenous and complex but they still need to be efficiently managed
- IT Infrastructure Library (ITIL) v3 provides a catalogue of best-practices for ITSM
- CMS is a key factor to effective IT Service Management (ITSM)
- Increase the efficiency of a Configuration Management System (CMS)

2. Goals
- Advanced ITSM through a model-driven CMS
- Facilitate runtime models of the managed system
- Prototypical Implementation

3. Model-Driven CMS
- Management Tools
  - Use graphical model editors to facilitate comprehension
  - Apply model-based analysis for advanced reasoning
- CMDB
  - Configuration models (runtime models) of the managed system including logical dependencies
- Federation & Reconciliation
  - Transforms vendor specific configuration models of MDRs to partial configuration models in CMDB
  - A configuration model is derived by applying model merge on all partial configuration models
- Vision of Autonomic Computing
  - Automatically derive runtime models (configuration models)
  - Automatically derive/execute changes to keep system running

4. Prototypical Implementation
- MDR for EJB Servers and EJB Applications
  - Sensor/effector for reflecting the state and executing changes at runtime
- Federated CMDB based on Eclipse CDO
  - EMF-based repository for as-is and to-be configuration models and management models
  - Provides interfaces to query/update models
- Service Asset & Configuration Management Tool
  - Keeps as-is configuration models up-to-date
  - Triggers MDRs to federate and reconcile their data to CMDB
- Change Management Tool
  - Modeling changes in editor on basis of latest as-is configuration model
  - Changes as-is-configuration model is stored as to-be configuration model in CMDB
- Release & Deployment Management Tool
  - Derives change model based on latest as-is configuration model and to-be configuration model within CMDB
- Change model is deployed to all MDRs for execution

5. Application Example
- Figure 2 shows the models of an exemplary release & deployment management process
- As-is configuration model (dark shaded) and to-be configuration model (dark+light shaded) loaded from CMDB
- Both configuration models are compared and a semantically rich change model is automatically derived by:
  - Derive EMF compare model with EMF compare
  - Partial configuration models in CMDB
  - Manually derive runtime models (configuration models)

6. Future Work
- Keep on evaluating the hypothesis that a model-driven CMS increases efficiency of ITSM (case study)
- Implement additional MDRs to improve the coverage of the configuration model
- Implement a full round-trip
- Implement further management tools to the system