

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

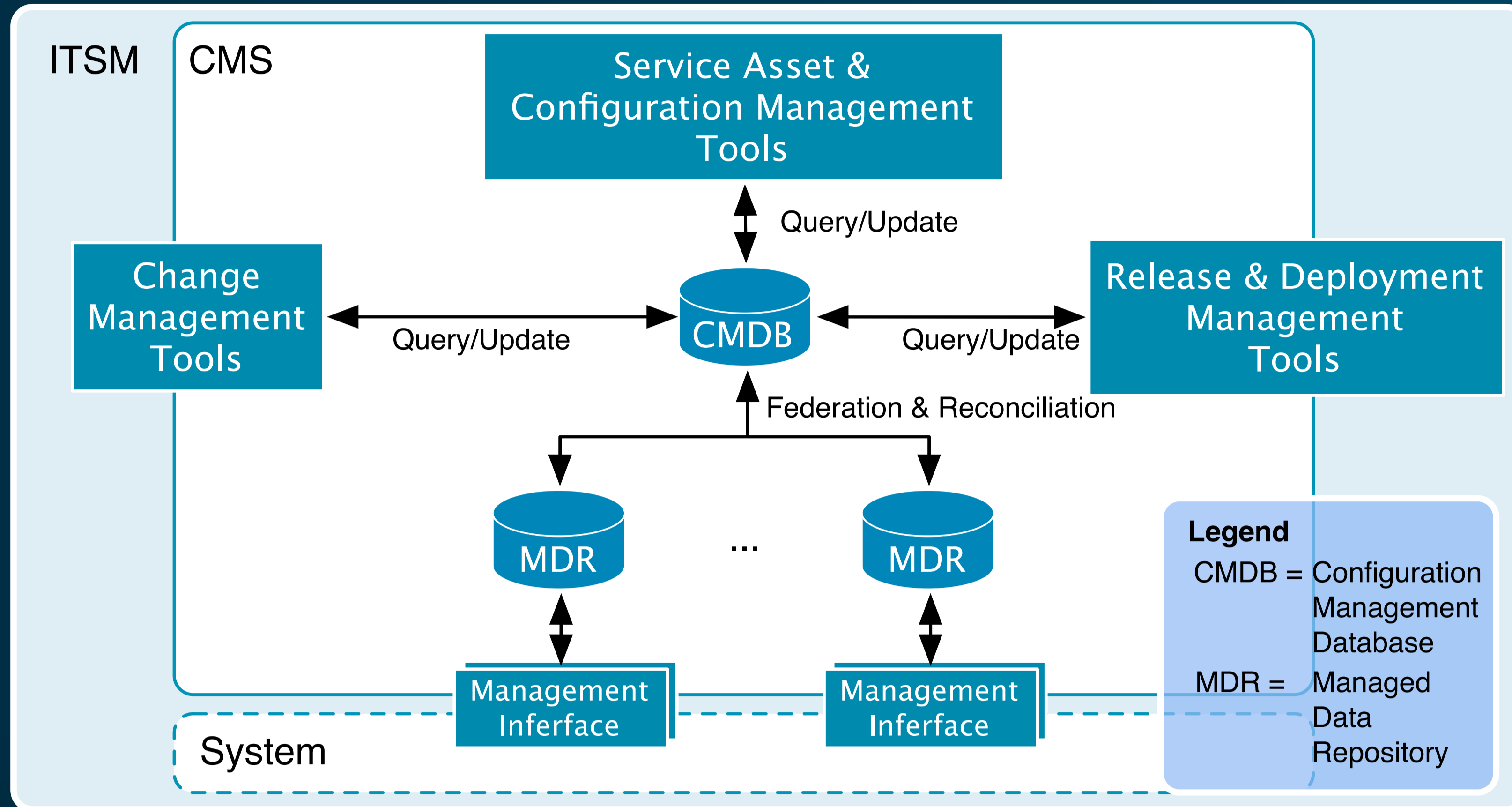


Figure 1: A common CMS within the Context of ITSM

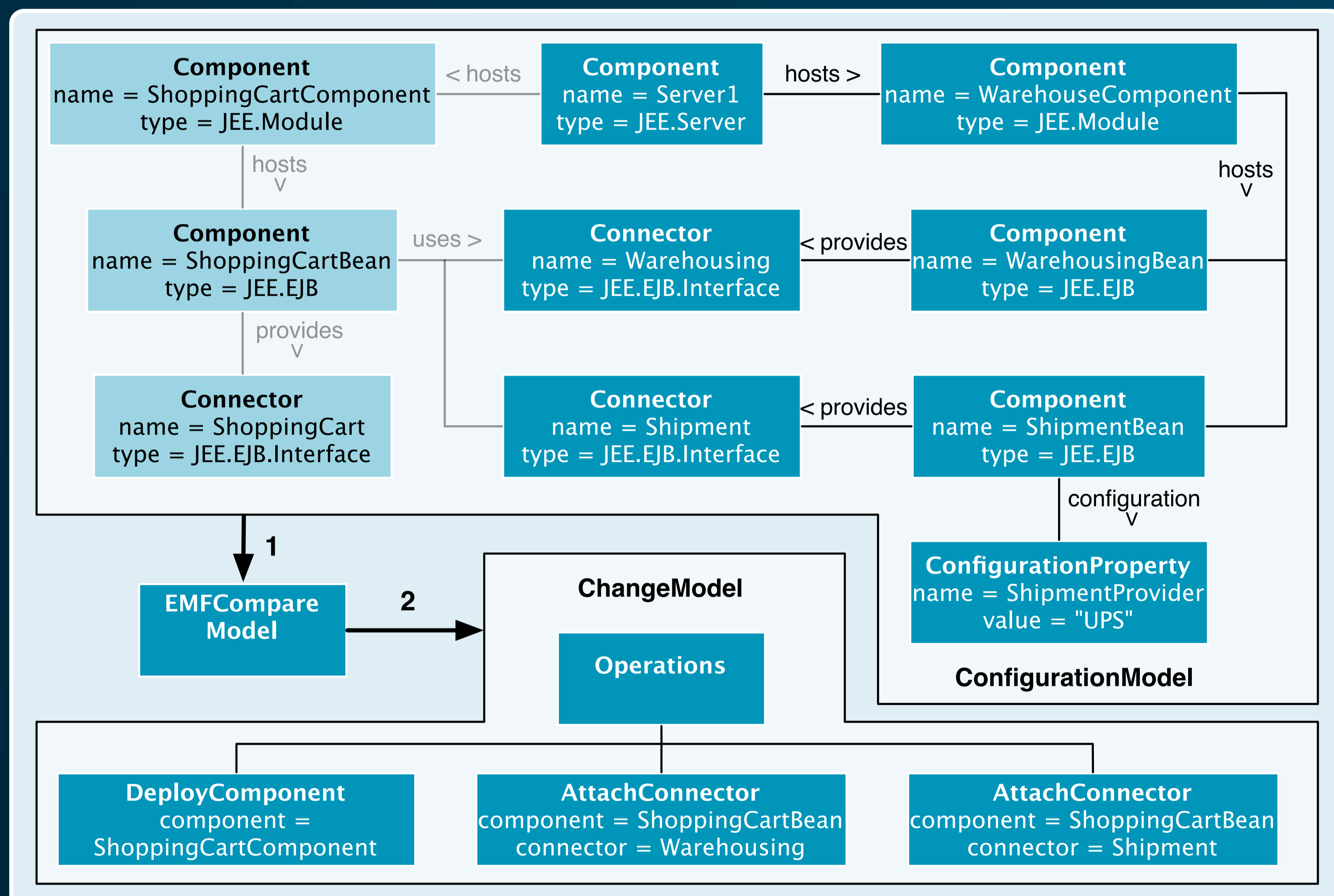


Figure 2: Models for Release & Deployment Management

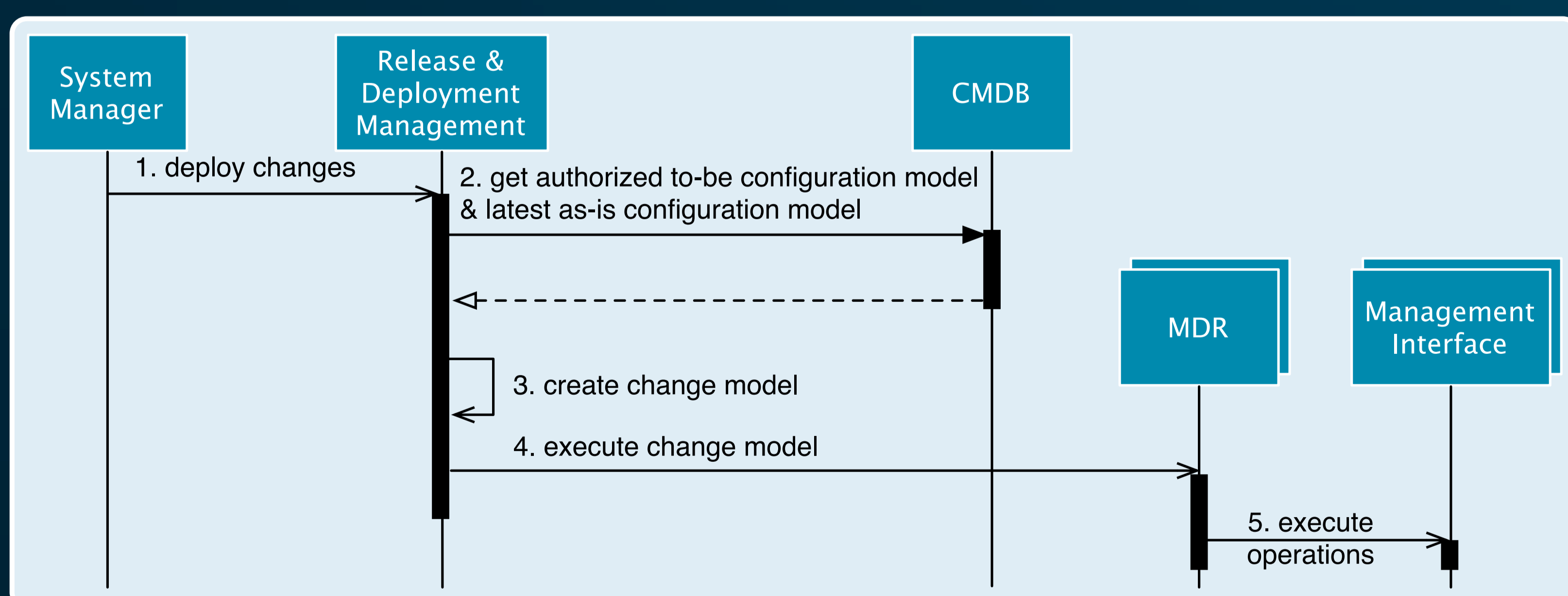


Figure 3: Sequence Diagram for Deploying Changes

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
- Query/Update
 - Connects management tools and the CMDB by means of model-based transformation/merge operations
- Federation & Reconciliation
 - Transform 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
 - Changed 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:
 - 1. Derive EMF compare model with EMF compare
 - 2. Derive change model from EMF compare model
 - The changes are subsequently deployed to all MDRs for execution
- The whole process of deploying changes is shown in Figure 3

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