



Architecture and Modelling, new and next

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IBM Software

Innovate2012

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Agenda

RSA 2011 Highlights

What's New in RSA 8.5

- MDD
- BPMN
- Base Modeling
- Extensions
- What's New in RSA Design Manager 4.0

Topology Modelling

What is Rational Software Architect (version 8.x)

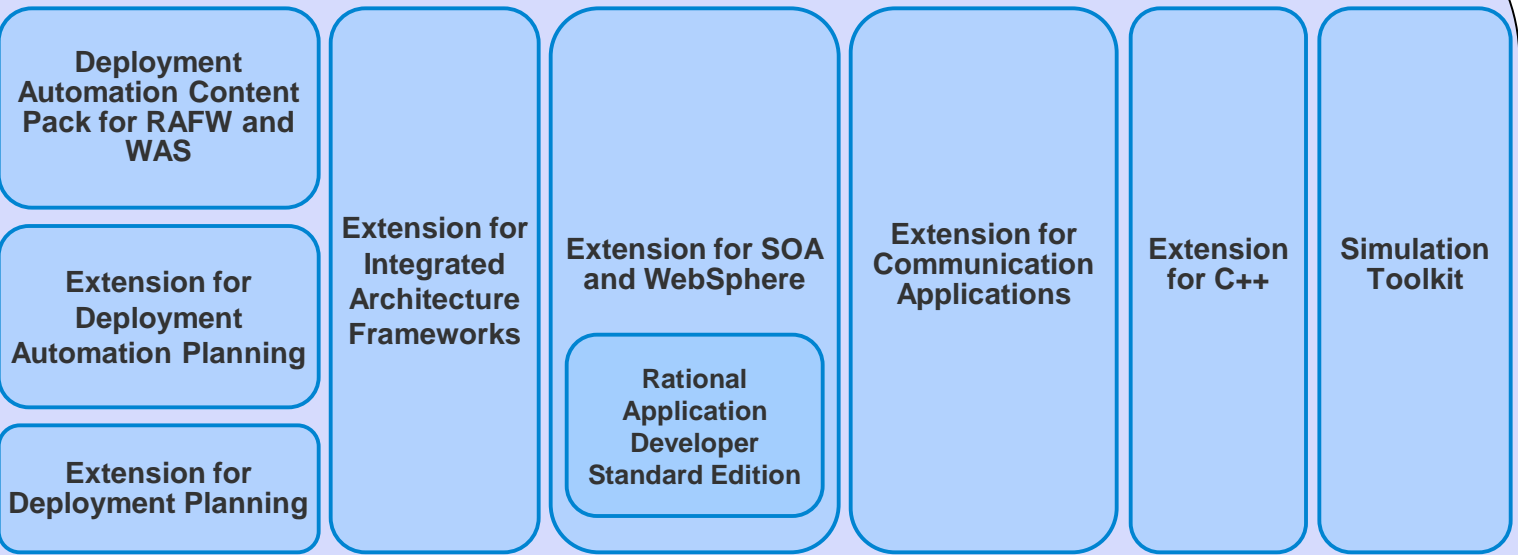
Rational Software Architect is a modelling tool that allows a user to create models of their applications, systems and deployments using UML, BPMN and other modelling notations. It also provides a Java development environment, a transformation engine that generates code, models and schemas.



Rational Software Architect v8 family

An offering with extensions for specific domains, architectural needs and industry

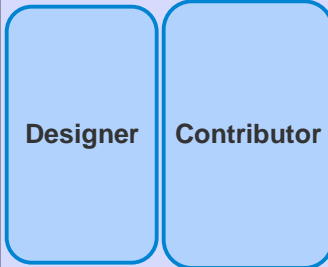
Rational Software Architect Family



Rational Software Architect Core foundation

- Agile Sketching
- UML 2.2 modeling support
- BPMN 2 modeling support
- Built in transformations for Java, C#, VB.NET
- Requirements integration and traceability
- Cloud support

RSA Design Manager



Rational Software Architect 2011 Highlights

▪ Rational Software Architect

- **Agile Sketcher**

- **Model Animation and Execution**

- Introduced service specification and development tools aligned to **Rational SOMA 2.9** guidance

- Create and design **services based on REST** architectural style

- Modeling JEE applications using Apache **Struts Framework**

- **Deployment Planning and Automation** and automation content pack for WAS, Integration with **TADDM**

- **BPMN2 Support extended** to Choreographies and simulation

- Model Animation and **Execution support for UAL** (UML Action Language)

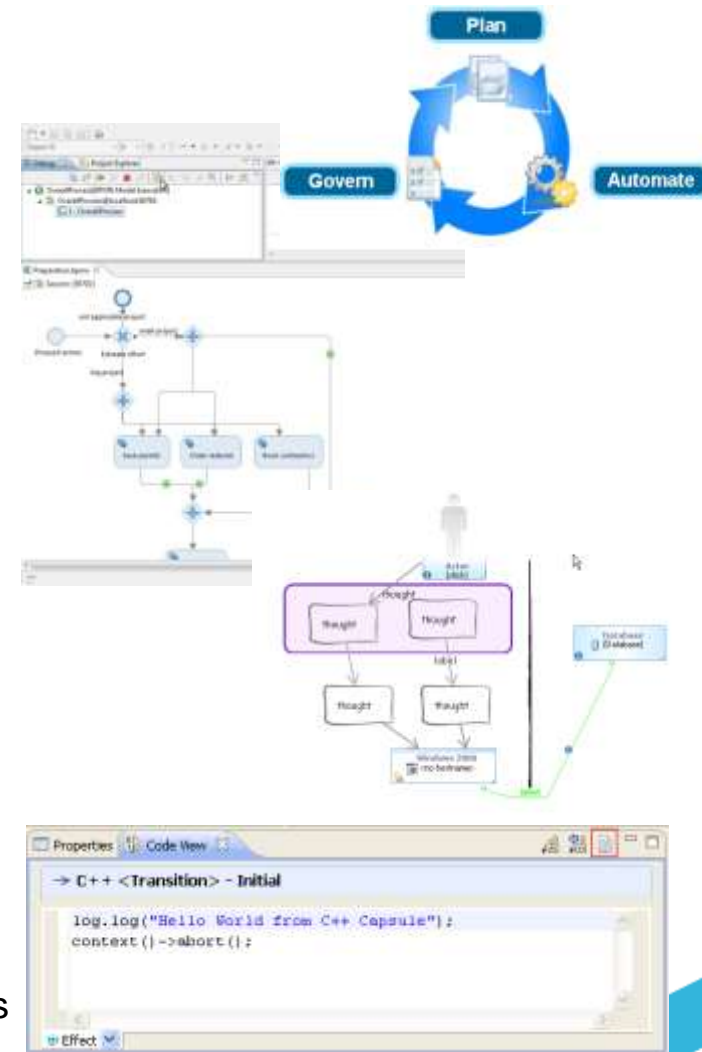
- RSA **Jazz** enablement via **RSA Design Manager**

▪ Rational Software Architect Real-Time Edition

- **Performance improvements** for very large real-time models

- **Improved Code Viewers** and better support for long code snippets

- RSA RTE **Jazz** enablement via **RSA Design Manager**



Java 7 support

- Java visualizer and transform supports Java 7 Language constructs: e.g.,

- try-with-resources statement
- Switch string statement
- Multi-catch and final re-throw
- Underscores in numeric literals
- Binary integral literals
- Diamond operator

```

public void newTry() {
    try {fileOutputStream fos = new FileOutputStream("novio.txt");
        DataOutputStream dos = new DataOutputStream(fos);
    }
    dos.writeUTF("Java 7 block Buster");
    catch (IOException e) {
        // log the exception
    }
}

static void switch_case_method() {
    String a = "";
    final String j = "TestString";
    switch (a) {
        case "quux":
            empMethod();
            break;
        case "quux":
            empMethod();
            break;
        case "quux":
            empMethod();
            break;
    }
}

private static void tempMethod() {
}
    
```



```

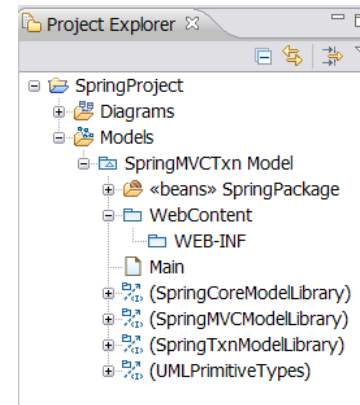
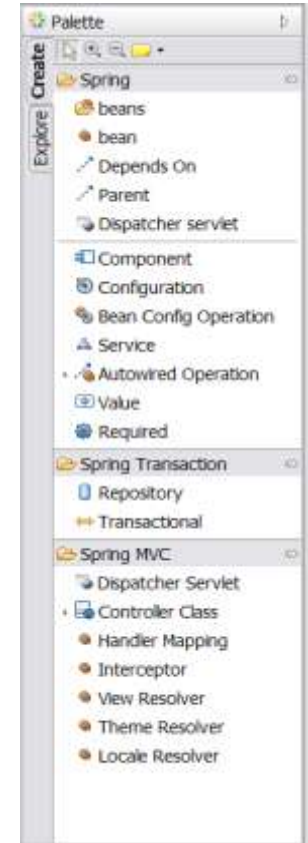
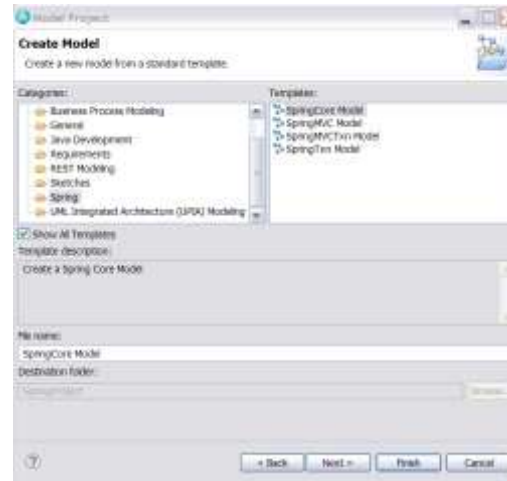
public void testDiamond() {
    // new diamond notation is sufficient
    List<String> list = new ArrayList<>();
    Map<String, List<String>> map = new HashMap<>();
}
    
```

```

public class Class1 {
    /**
     * <!-- begin-UML-doc -->
     * <!-- end-UML-doc -->
     * @generated "UML to Java (com.ibm.xtools.transfo
     */
    private int underscoreAttribute = 123_456_789;
    /**
     * <!-- begin-UML-doc -->
     * <!-- end-UML-doc -->
     * @generated "UML to Java (com.ibm.xtools.transfo
     */
    private int binaryAttribute = 0b1010101;
}
    
```

RSA Spring Framework Support

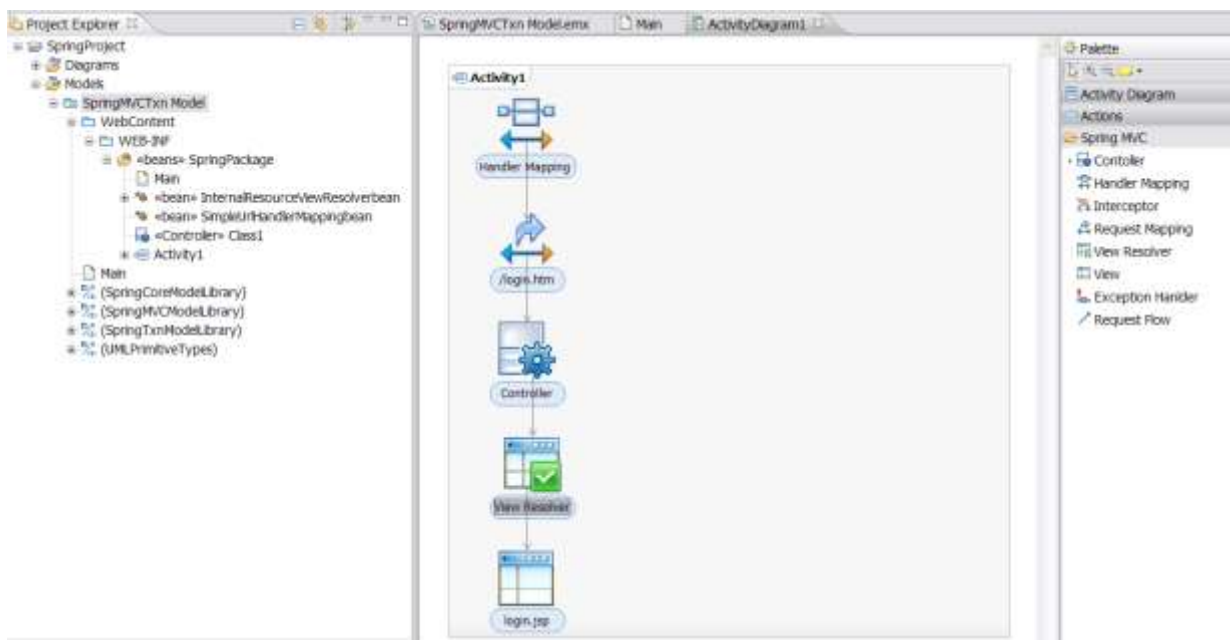
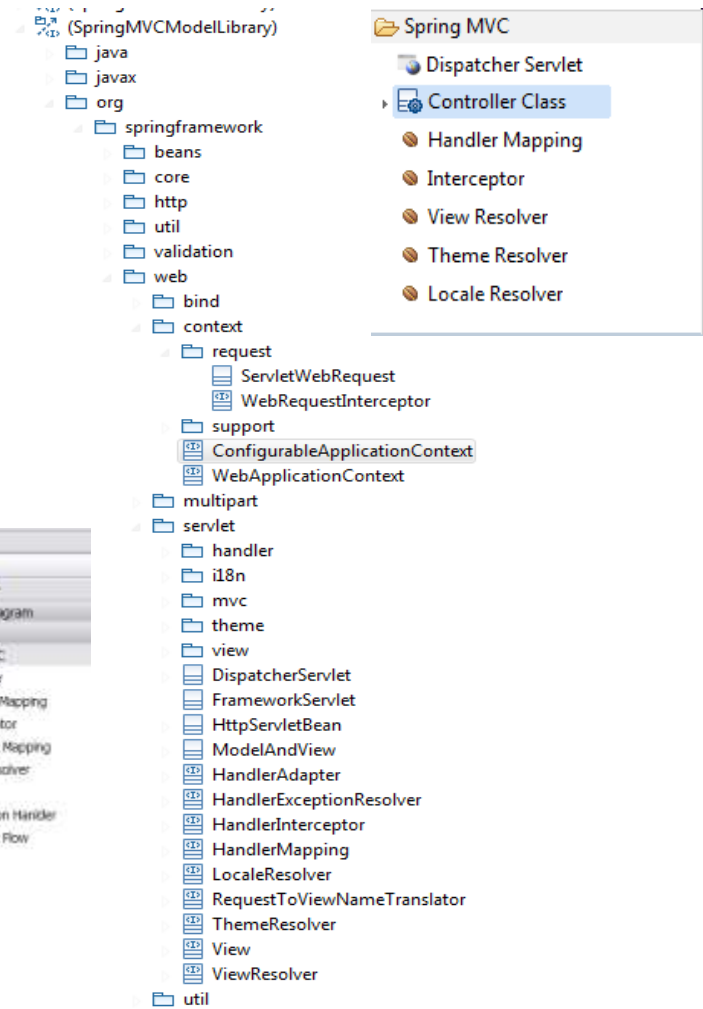
- Provide modeling and transformation of Spring Framework v2.5 – 3.0.6.
- Supported Spring Modules (Profiles):
 - Core
 - MVC
 - Transaction
- RSA Supports Spring Core bean definitions for Spring Container configuration file
- RSA supports Context annotations for Spring and annotated classes for Component, Configuration and Service can be defined with Autowired, Required and Value annotations
- Spring Transaction supports Repository definition with Transactional Operation details



Spring Application Development Framework Reference Documentation: <http://springsource.org>

Spring MVC Model Designing

- Spring MVC models can be designed as an Activity Flow
- RSA supports designing of MVC models with Controller beans and annotations
- Core model Library supports Spring defined beans for Dispatcher Servlet, Controller, Handler Mapping, View Resolver, Theme Resolver, Locale Resolver etc.



Transformation of Spring Models

- Spring Models can be transformed to Dynamic Web Projects
- UML classes of Spring model are transformed to java classes with required annotations and import statements
- Spring beans and their properties are transformed to configuration file for Spring container
- Spring MVC Activity Flow is transformed to Java classes and configuration file

UML to Java Transformation: SpringTC.tc

UML to Java extensions

ID	Name	Description
<input type="checkbox"/> com.ibm.xtools.transform.java.enum...	UML to Java Custom Enumeration Extension	UML to Java support for alternate style Java enumer...
<input type="checkbox"/> com.ibm.xtools.transform.java.exten...	UML to Java Custom Getter and Setter Nam...	An extension that ignores Java conventions for the n...
<input checked="" type="checkbox"/> com.ibm.xtools.transform.uml2.java....	Passive Class Statemachine Extension	Extension to generate java code for statemachines in...
<input type="checkbox"/> com.ibm.xtools.transform.uml2.java...	UML to Java Vararg Override Extension	UML to Java extension to override generation of vara...
<input checked="" type="checkbox"/> com.ibm.xtools.transform.uml2.spring	UML to Java Spring Transformation extension	Spring extension for UML2 to Java5 transformation

Java to UML extensions

ID	Name	Description
<input type="checkbox"/> com.ibm.xtools.transform.java.enum...	Java to UML Custom Enumeration Extension	Java to UML support for alternate style Java enum...
<input type="checkbox"/> com.ibm.xtools.transform.java.uml.v...	Java to UML Apply Vararg Keyword Extension	Java to UML extension to apply the keyword "vara...
<input checked="" type="checkbox"/> com.ibm.xtools.transform.spring.uml2	Spring Java5 to UML Transformation Extension	Spring extension for Java5-to-UML Transformation

Protocol: Conceptual Mixed Reconciled

Main | Source and Target | Extensions | Collections | Java-to-UML Associations | Mapping | Spring Properties

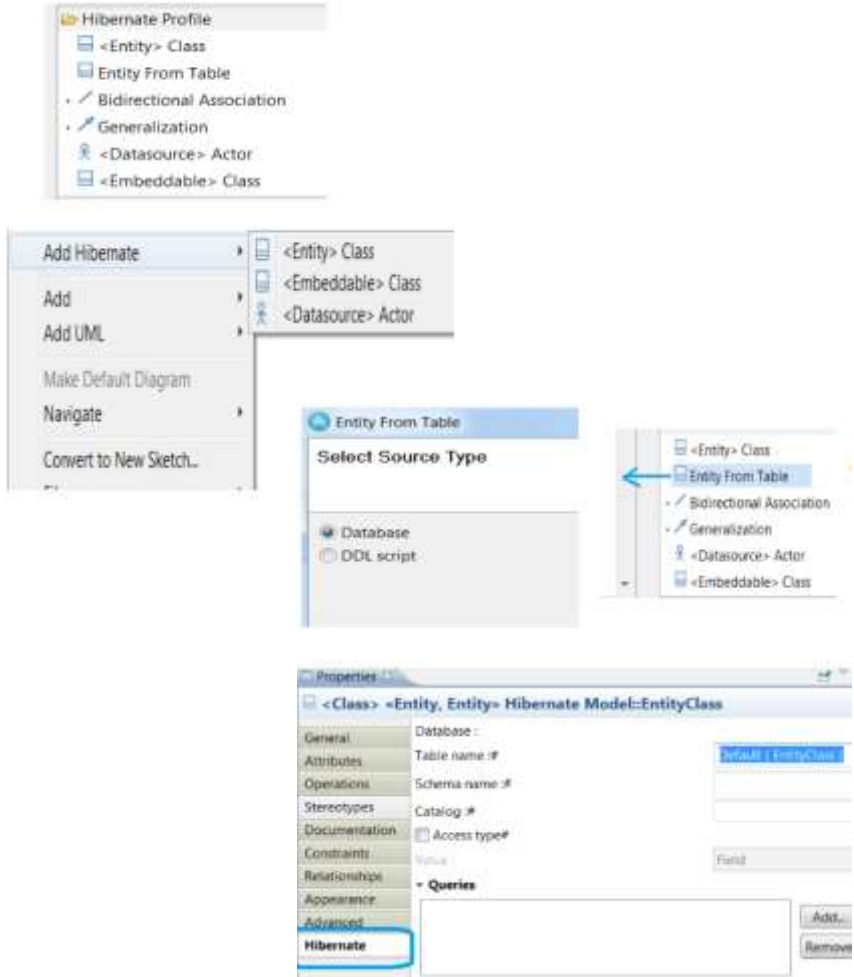
Hibernate Framework Support in RSA

- Provide modeling and transformation support for Hibernate Framework v3.5 & 3.6
- Transformation support to generate hibernate-annotated Java code and hibernate configuration and mapping file(deployment descriptor).
- Reverse transform support to generate the Hibernate model from either annotated source files or deployment descriptors.
- The hibernate modeling and transforms support includes modeling elements from Java persistence API also.
- Hibernate support in RSA 8.5 includes Entity and related elements, inheritance support, associations, identifier and properties, queries and custom-SQL.

Hibernate Reference Documentation: <http://www.hibernate.org/docs>
Hibernate tools for eclipse/RSA are available <http://www.hibernate.org/subprojects/tools.html>

Hibernate Modeling Toolset

- Modeling toolset now includes a Hibernate profile, model templates, palette entries, content menus and property page enhancements.
- Entities can be built-up from scratch or mapped to an existing table from a database.



Spring Hibernate Model Support

- RSA supports Models with Spring and Hibernate Modeling support
- RSA template model comes with Spring and Hibernate Model definitions
- Model library comes with Hibernate specific Spring classes for modeling

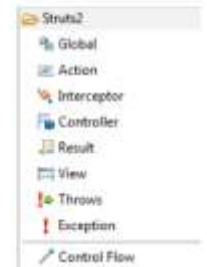
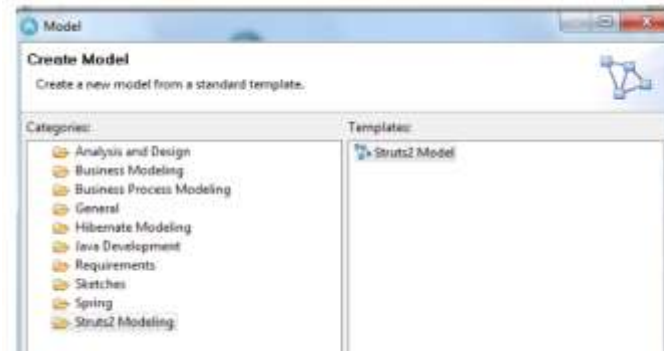
Struts2 Model Driven Development

- *UML-to-Java transformation Extensions*
- *Assisted tooling for easier creation of Struts2 elements*
- *Forward & reverse transformation*
- *Generation of Struts2 configuration XML*
- *Generation of Struts2 Annotations*
- *Support of standard Struts2 validations on model data*

Struts 2 Reference Documentation: <http://struts.apache.org>

Struts2 Modeling Toolset

- Modeling toolset now includes a Struts 2 profile, model template, palette entries, context menus, wizards and property page enhancements
- Model structural view (Views, Controllers, Interceptors) using Class diagram
- Model navigation flows using Activity diagram



Result Type Class:

▼ Params

Name	Value

Abstract:

Extends:

Default Class Reference:

Default Action Reference:

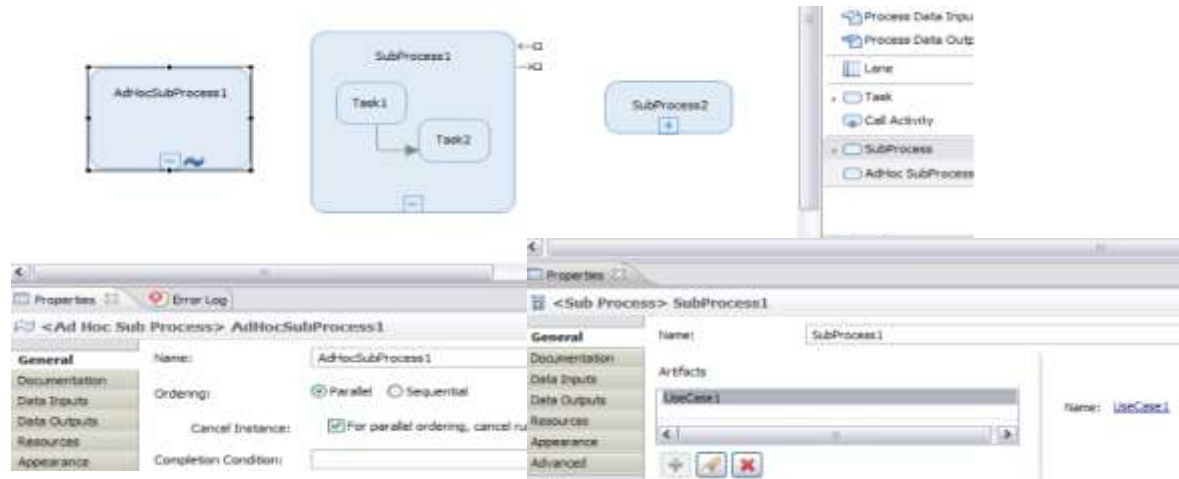
Default Interceptor Reference:

Default Result Type:

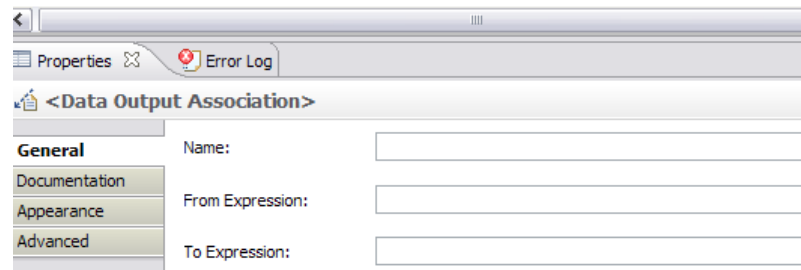
Namespace:

BPMN Modeling Enhancements

– BPMN SubProcess and Adhoc SubProcess

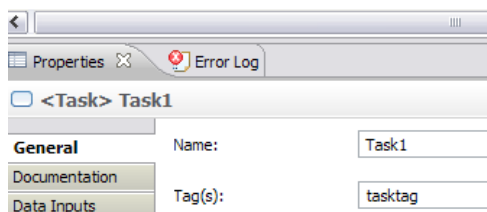


– Assignments can be provided for data associations. A From and a To Expression can be added for data associations from Properties view

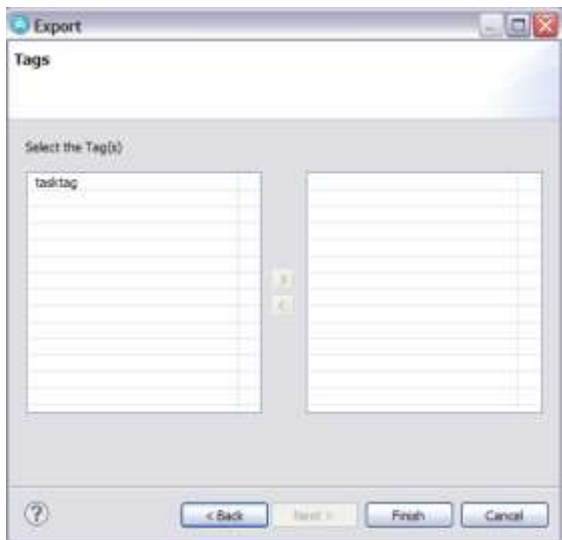


Support for tagging BPMN elements and scoped export of BPMN elements

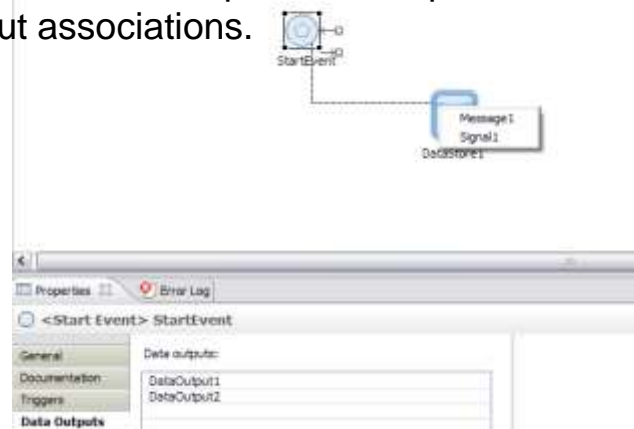
- Support for tagging BPMN elements
- Can select to export tagged elements only



- Black box pools & message flows between pools

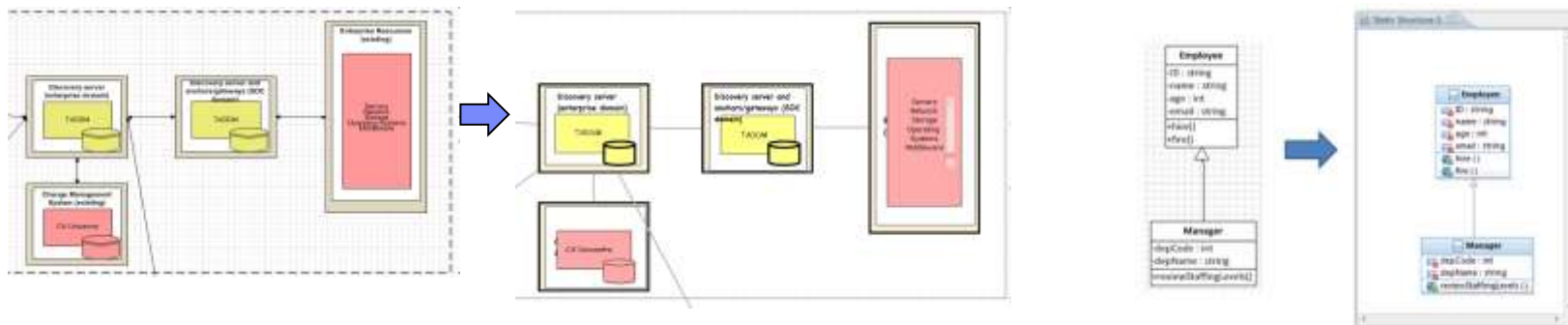


- Events can now be connected to data stores, data objects, process data inputs and outputs to create data input/output associations.



Microsoft® Visio Diagram Import

- Imports UML (Class and Use case) and Network Diagrams drawn in Visio 2010
- Preserve the semantic and makes best effort towards preserving visual layout.



- Provides an HTML import report and navigable ToDo markers wherever possible user intervention is required.

Visio-import report for file "Sample_for_deck.vdx".

Import finished in 24 seconds with 4 information and 14 warning messages

Information collected during import process:

S.No	Severity	Message	Type	ActionTaken	Details
1	Information	Processing Document - (Temp1_for_deck)	Document - (Temp1_for_deck)	Completed	

Processing Document - (Temp1_for_deck)

S.No	Severity	Message	Type	ActionTaken	Details
1	Information	Processing Page - (Page1)	Page - (Page1)	Completed	
2	Warning	Processing Page Document Name - (Temp1_for_deck)	Document - (Temp1_for_deck)	Create Topology Model - (Temp1_for_deck)	Warning ignored

Processing Page - (Page1)

S.No	Severity	Message	Type	ActionTaken	Details
1	Warning	Shape not recognized in domain	Shape - (Security)	View created for shape	Warning not reported
2	Warning	Recognized topology domain shape	Shape - (SP)	Create job - same ServiceClass. Added capabilities - same Service	Warning ignored
3	Warning	Shape not recognized in domain	Shape - (SP)	View created for shape - Security (Target)	Warning not reported
4	Warning	Recognized topology domain shape	Shape - (Server)	Create job - same ServiceClass. Added capabilities - same Service	Warning ignored
5	Warning	Recognized topology domain shape	Shape - (Server)	Create job - same ServiceClass. Added capabilities - same Service	Warning ignored
6	Warning	Recognized topology domain shape	Shape - (Server)	Create job - same ServiceClass. Added capabilities - same Service	Warning ignored
7	Warning	Shape not recognized in domain	Shape - (SECURITY Diagram)	View created for shape - SECURITY Diagram	Warning not reported

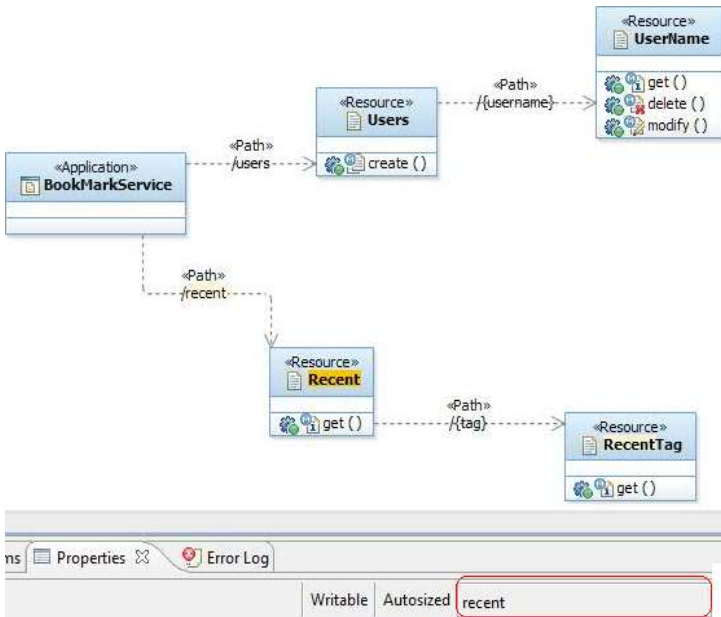
Tasks 33

10 items

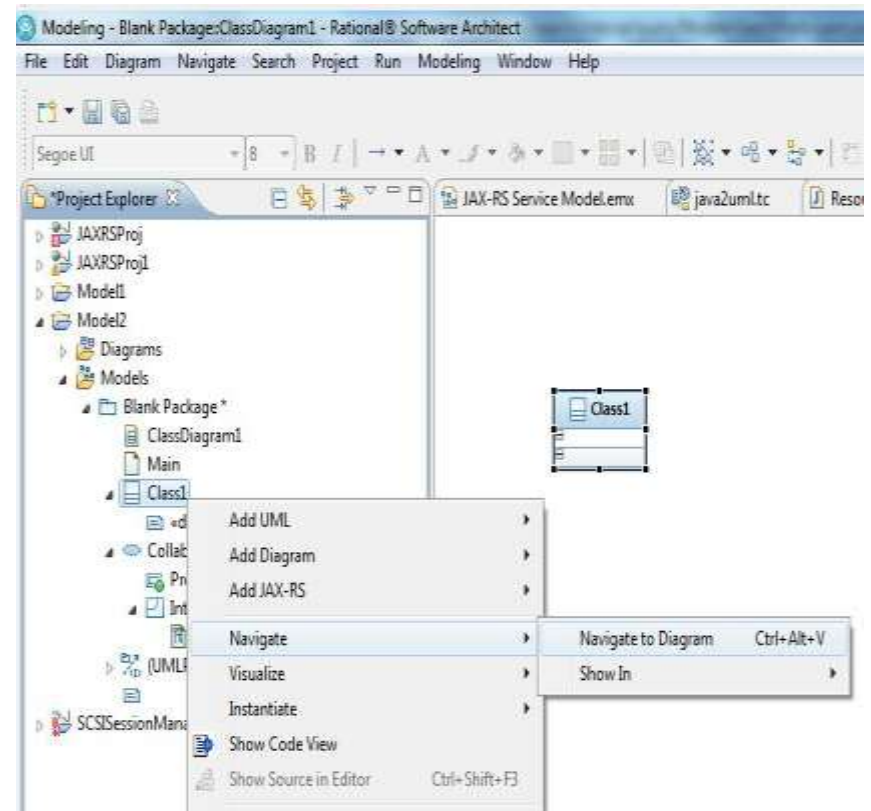
Description	Resource	Path	Location	Type
Edge created connecting "Server" to "Server".	Page-1.topologyv	/esf/Blueprint	Page-1	Visio Import Task
Edge created connecting "Server" to "Server (t...	Page-1.topologyv	/esf/Blueprint	Page-1	Visio Import Task
Edge created connecting "Server" to "SP".	Page-1.topologyv	/esf/Blueprint	Page-1	Visio Import Task
Edge created connecting "Server" to "SP".	Page-1.topologyv	/esf/Blueprint	Page-1	Visio Import Task
Edge created connecting "Server (target)" to "...	Page-1.topologyv	/esf/Blueprint	Page-1	Visio Import Task
View created for shape -	Page-1.topologyv	/esf/Blueprint	Page-1	Visio Import Task
View created for shape - Desktop(Target).	Page-1.topologyv	/esf/Blueprint	Page-1	Visio Import Task
View created for shape - Sample content for DIP...	Page-1.topologyv	/esf/Blueprint	Page-1	Visio Import Task
View created for shape - SECURITY Diagram.	Page-1.topologyv	/esf/Blueprint	Page-1	Visio Import Task
View created for shape - Z2: DIP.	Page-1.topologyv	/esf/Blueprint	Page-1	Visio Import Task

Usability Enhancements

- Incremental forward (Ctrl-J) and backwards (Ctrl-Shift-J) search in UML diagrams
 - Incremental search will highlight all matching elements in diagram

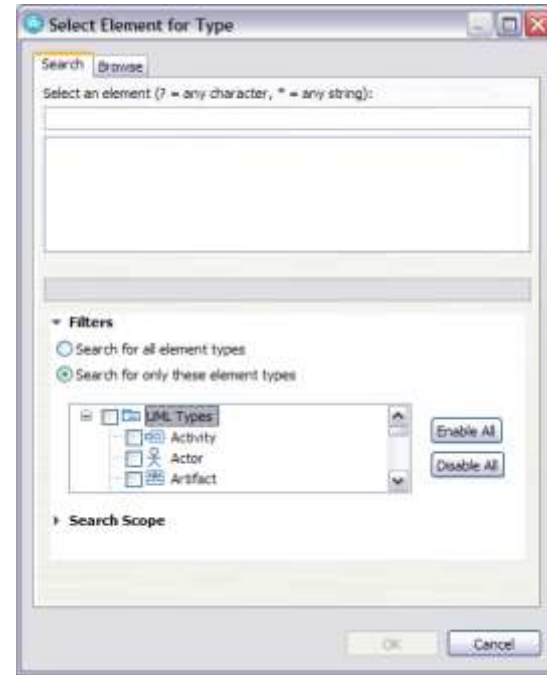


- Navigate To Diagram (Ctrl+Alt+V) PE action diagram
 - Multiple diagrams listed in search view

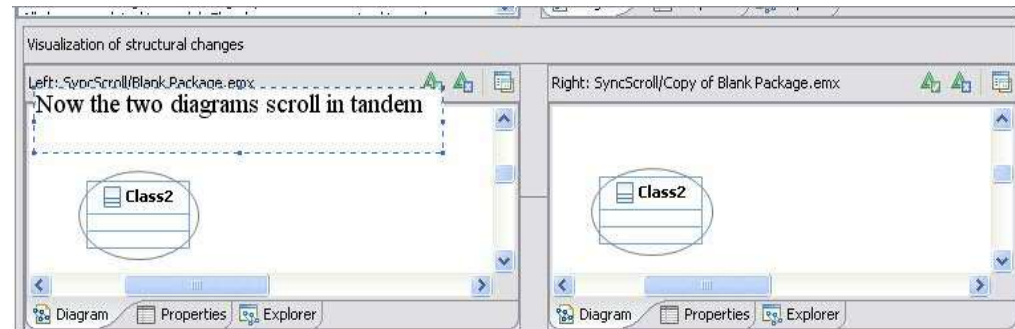
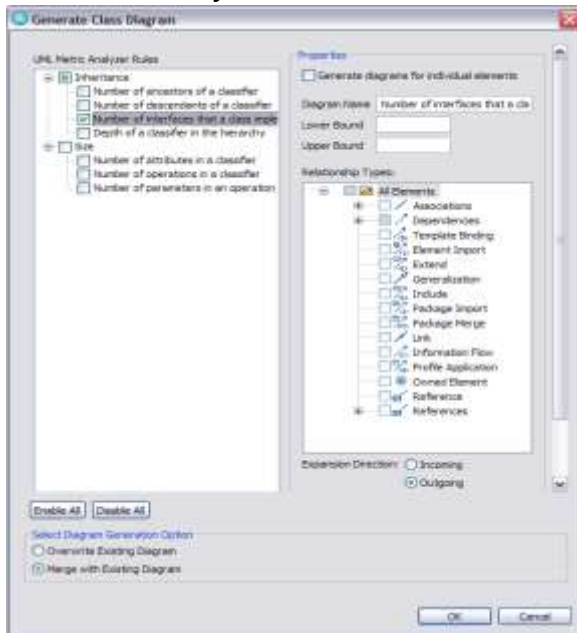


Usability Enhancements

- UML type filters provided in Search element dialog
 - These filters will complement the 'text' search by adding type filters to list 'type(s)' of interest only in search result
- Generate Class Diagrams Preference Editor action
 - generate class diagram automatically based on model analysis rules



- Synchronized horizontal & vertical scrolling is now supported for diagram compare

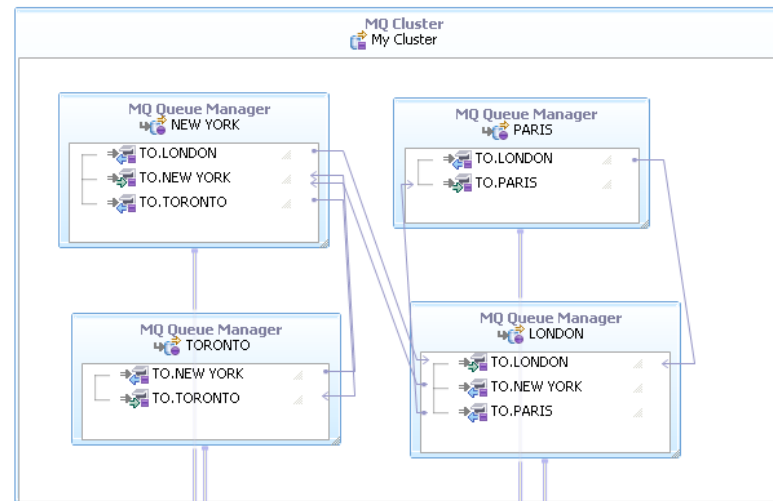
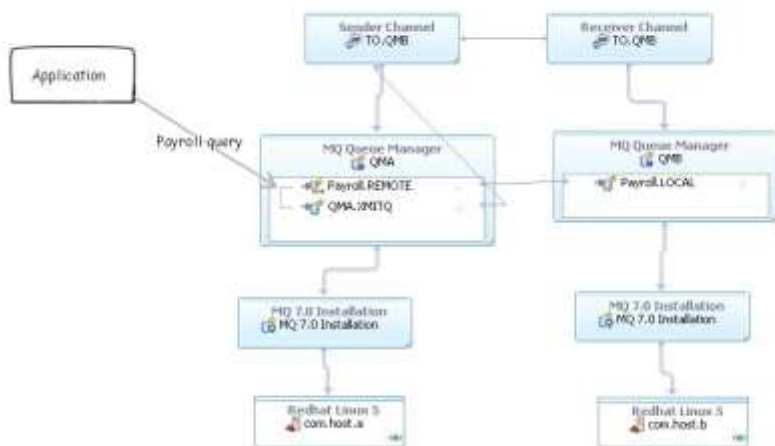
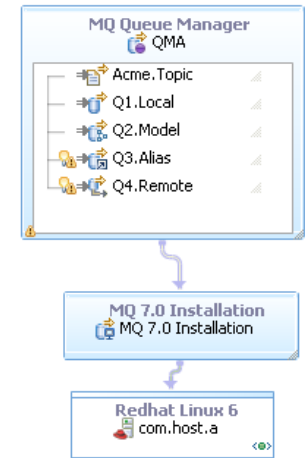


Other Usability Enhancements...

- Improved rich text support for HTML tags
 - Improved table formatting
 - Better handling of line break and paragraph breaks
 - Improved handling of HTML Lists (ordered and un-ordered)
 - Robust migration from 7.5.x to 8.5
- Ability to load multiple models and their sub-fragments at once
- Improved Search scope options
- Navigation support from properties view to container element
- Option to sort the Inheritance Explorer members in "inheritance order"

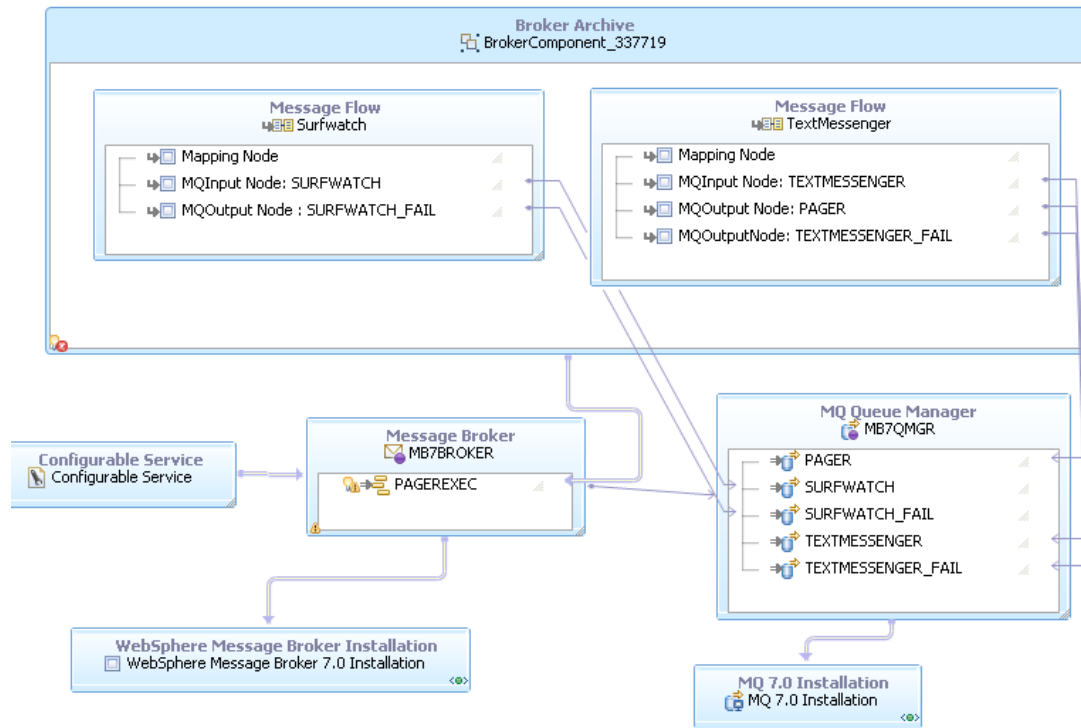
Deployment Planning: Support for WebSphere MQ Domain

- Modelling support for MQ Domain
 - Templates and palette entries, custom validations and resolutions, Unit filters, sample topologies
 - MQ Infrastructure: Installation, Queue Manager
 - MQ Destinations: Queues, Topic, Specify clusters
 - MQ Channels: Sender/Receiver, Server/Requester, ...
 - MD Configuration: Process, Service, Namelist, Listeners (TCP, SPX, etc)
 - MQ Security: Authentication info (LDAP, OSCP), Security Authorization
 - MQ Clusters



Deployment Planning: Support for WebSphere Message Broker Domain

- Modelling support for Message Broker
 - Templates and palette entries, custom validations and resolutions, unit filters, sample topologies
 - MB Infrastructure: Installation, Message Broker
 - MQ Configuration: Execution Group, Configurable Services, Security Constructs (tokens, token bindings, etc)
 - MB Applications: Broker Archive files, Msg Flows, Msg Sets, Msg Flow Nodes



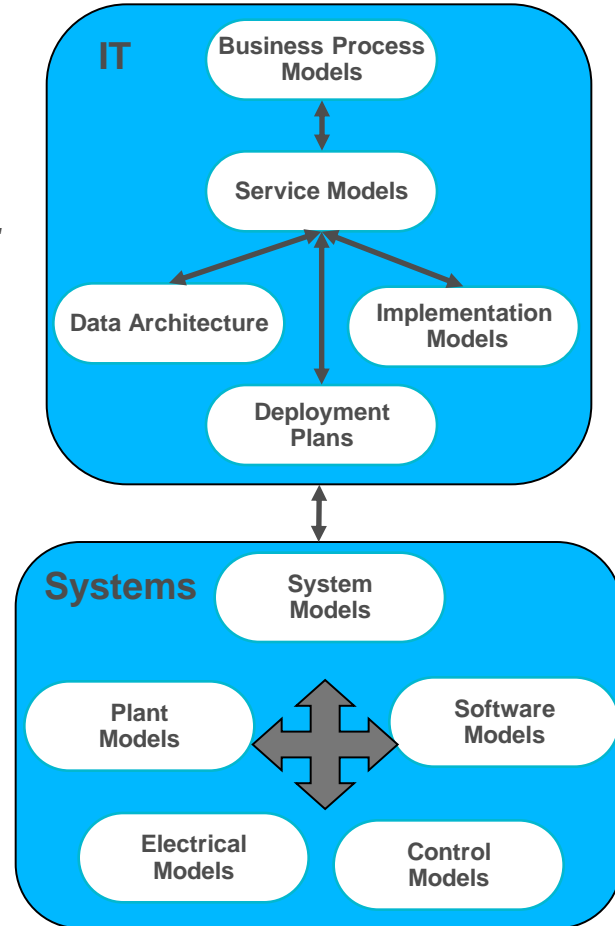
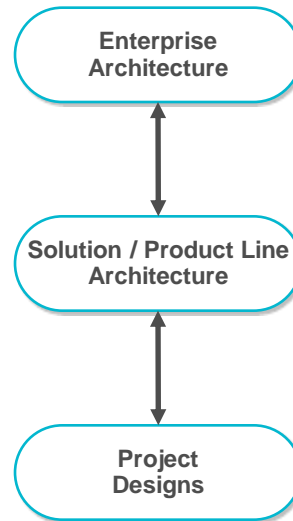
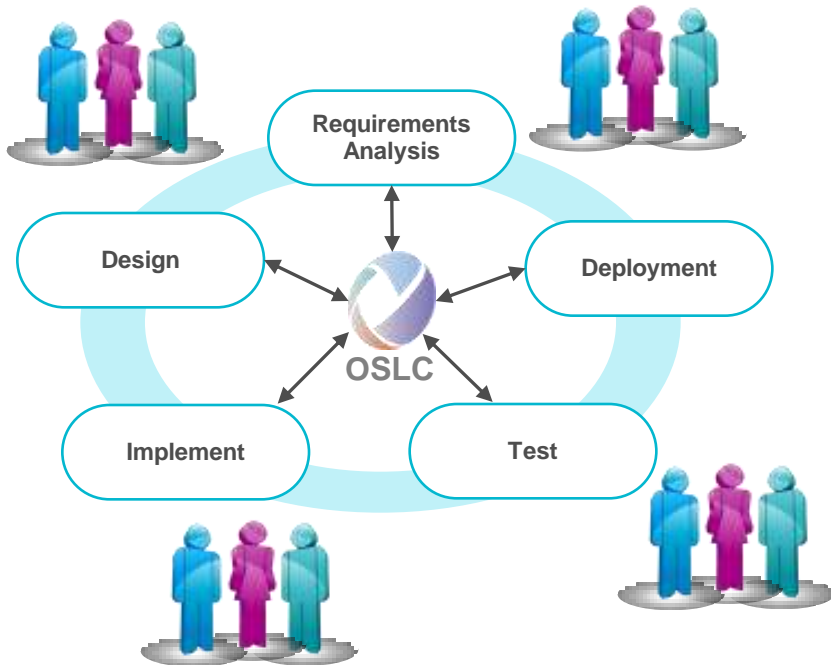
Collaborative Design Management Vision

Integrating and collaborating on designs across...

...the application and engineering lifecycles...

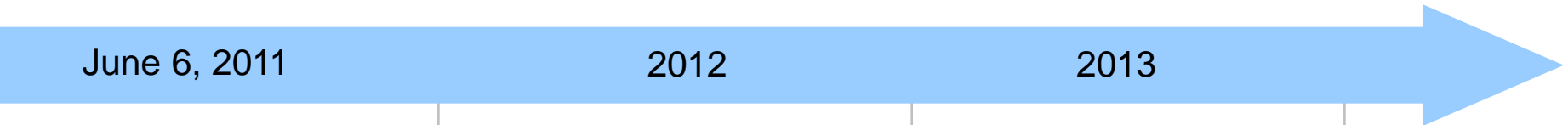
...levels of abstraction...

...and domains.



Enabling better collaboration, automation, reporting, and agility while reducing complexity and risk.

Collaborative Design Management Roadmap



June 6, 2011

2012

2013

Phase 1

- ▶ Design repository with Web based searching, viewing, and analysis
- ▶ Collaborate on designs with design reviews
 - ▶ Lifecycle integration
- ▶ Integration with Rational Publishing Engine for document generation and reporting

Phase 2

- ▶ Unify designs across domains with support for additional design types (extensibility / toolkit)
- ▶ Additional OSLC linking
- ▶ Change management for designs (SCM optional)
 - ▶ Embedded document generation and reporting

Phase 3

- ▶ Unify designs across domains with support for customizable domain modeling behavior and user interfaces
 - ▶ Domain specific functional capabilities (transformations, simulation)
- ▶ Web based editing for some RSA, Rhapsody, and custom domain models
- ▶ Automation services

New in RSA Design Manager 4.0

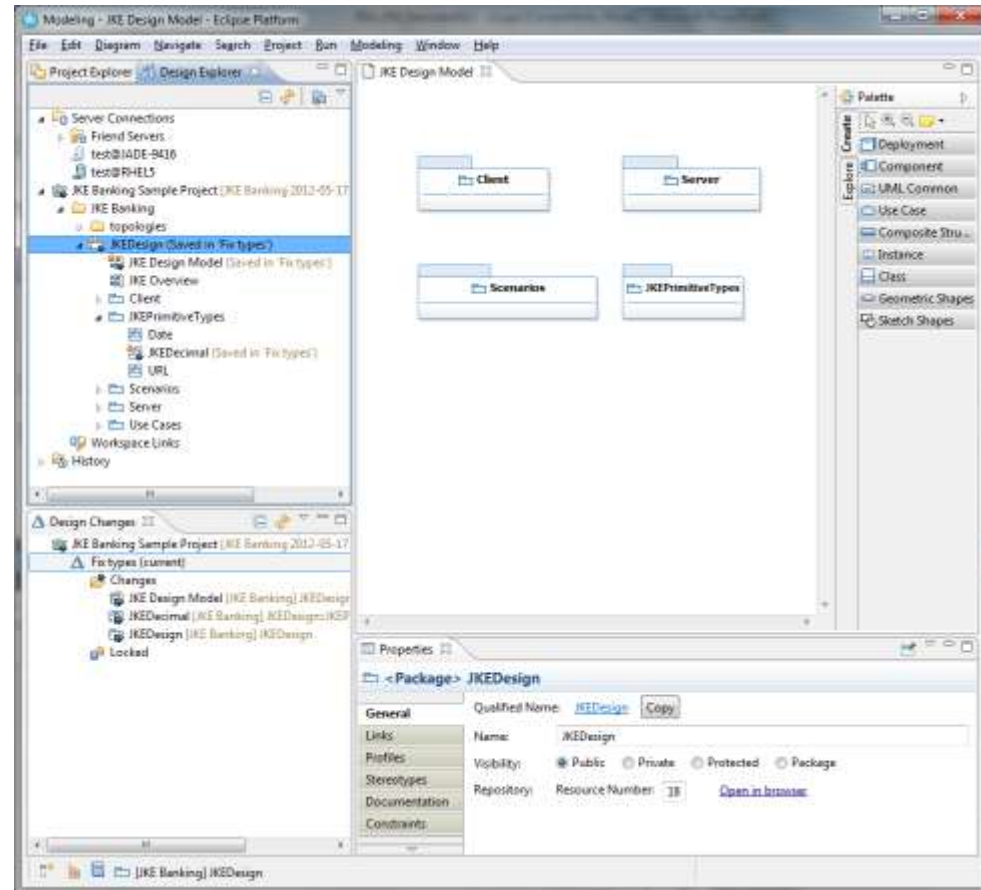
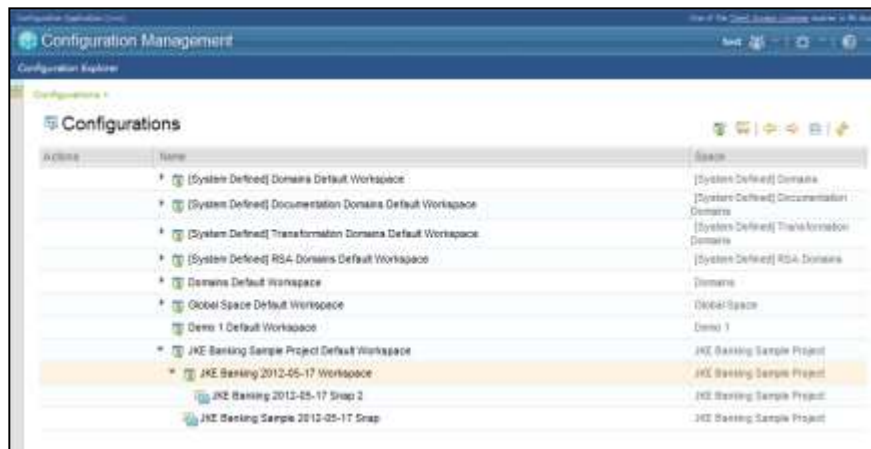
- Collaborative Lifecycle Management Integration
- Configuration Management for Designs
- Reporting and Document Generation
- Extensibility
- New Domains: Sketching, Rich Text Design Documents
- Search Improvements
- Impact Analysis
- RSA Transformations

Collaborative Lifecycle Management Integration

- Common user administration
- Common deployment configurations
- Lifecycle project administration
- Bi-directional traceability with RRC
- TRS (Tracked Resource Sets) integration
- “Money that Matters” Sample Scenario

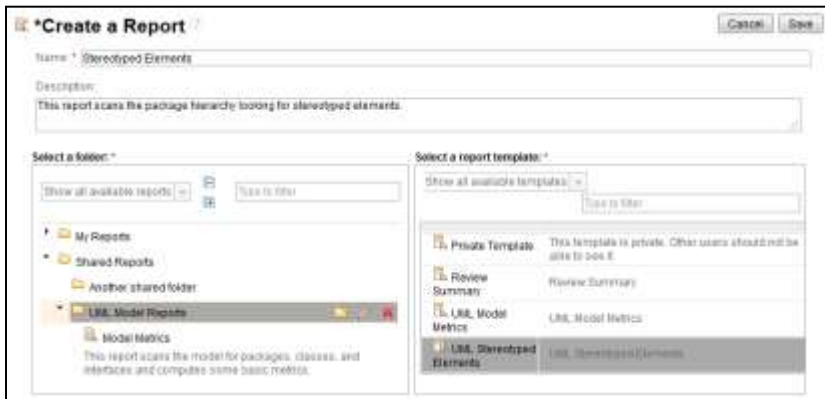
Configuration Management for Designs

- Serial and parallel configuration management for designs
- Change history, compare and merge
- Design reviews on private changes prior to sharing



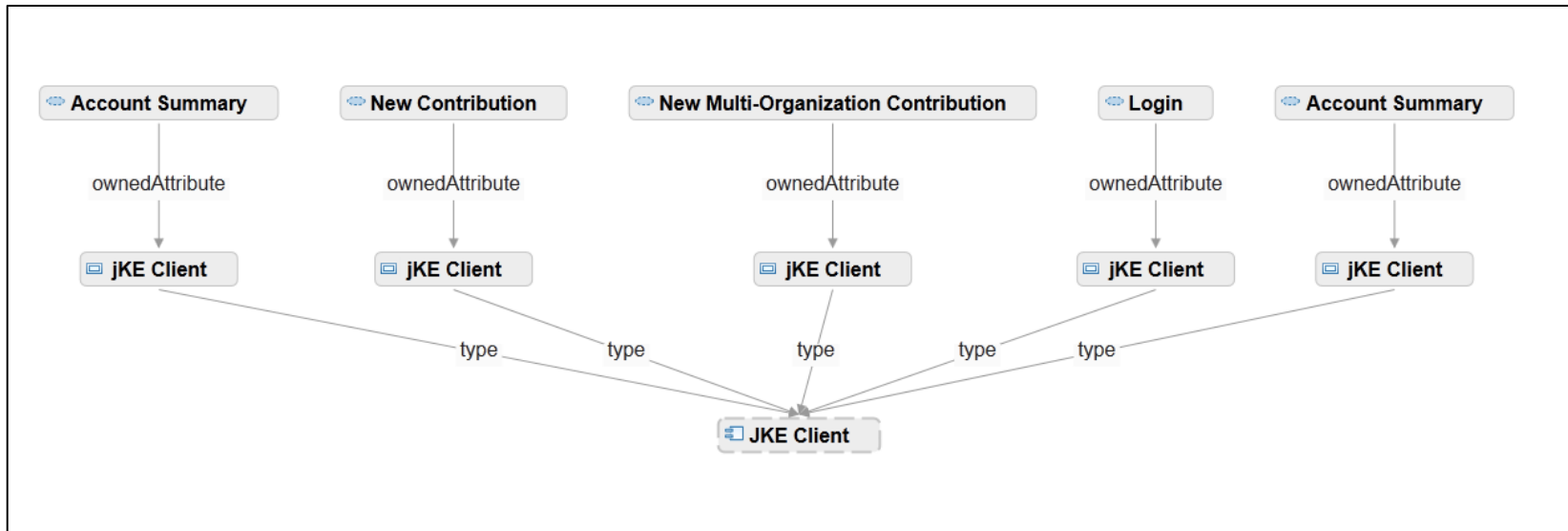
Reporting and Document Generation

- Document generation with RRDG (Rational Reporting for Document Generation)
- Report templates based on RPE (Rational Publishing Engine)



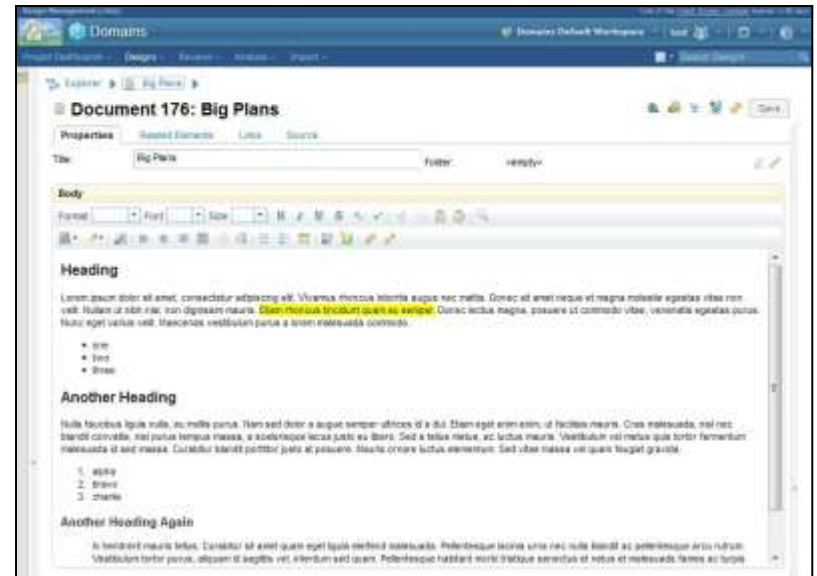
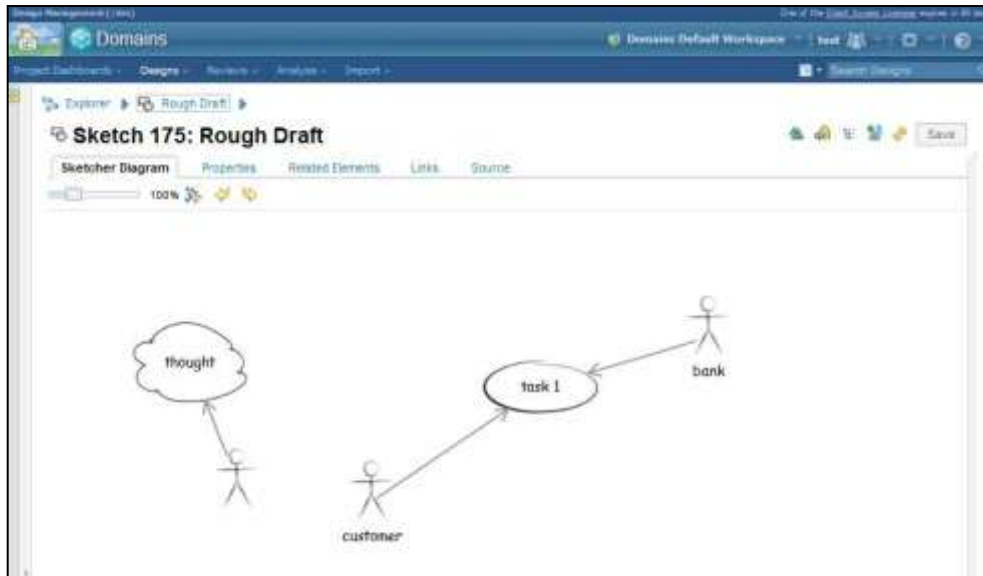
Impact Analysis

- Follow all links in DM repository and present them graphically (Impact Analysis Diagrams)
- Pre-define configurations that limit the links followed
- Variety of graph styles
- Persistence of configurations and diagram definitions



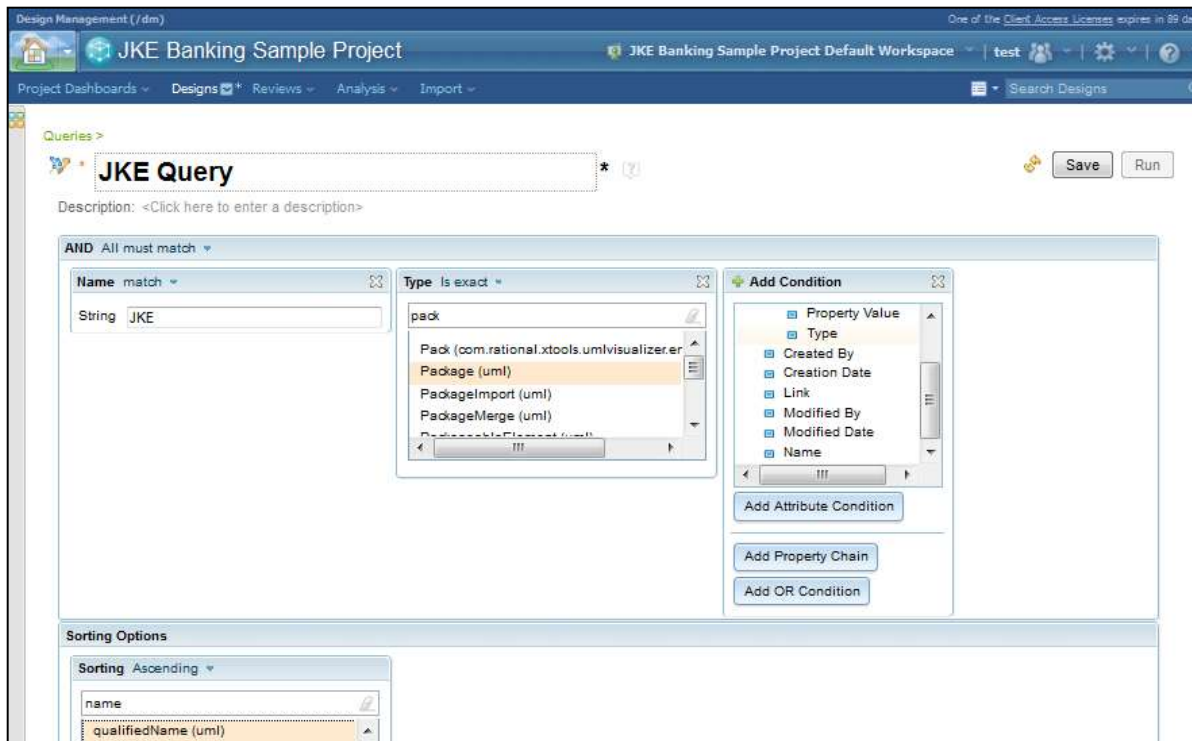
New Domains

- Sketching
- Rich Text Design Documents



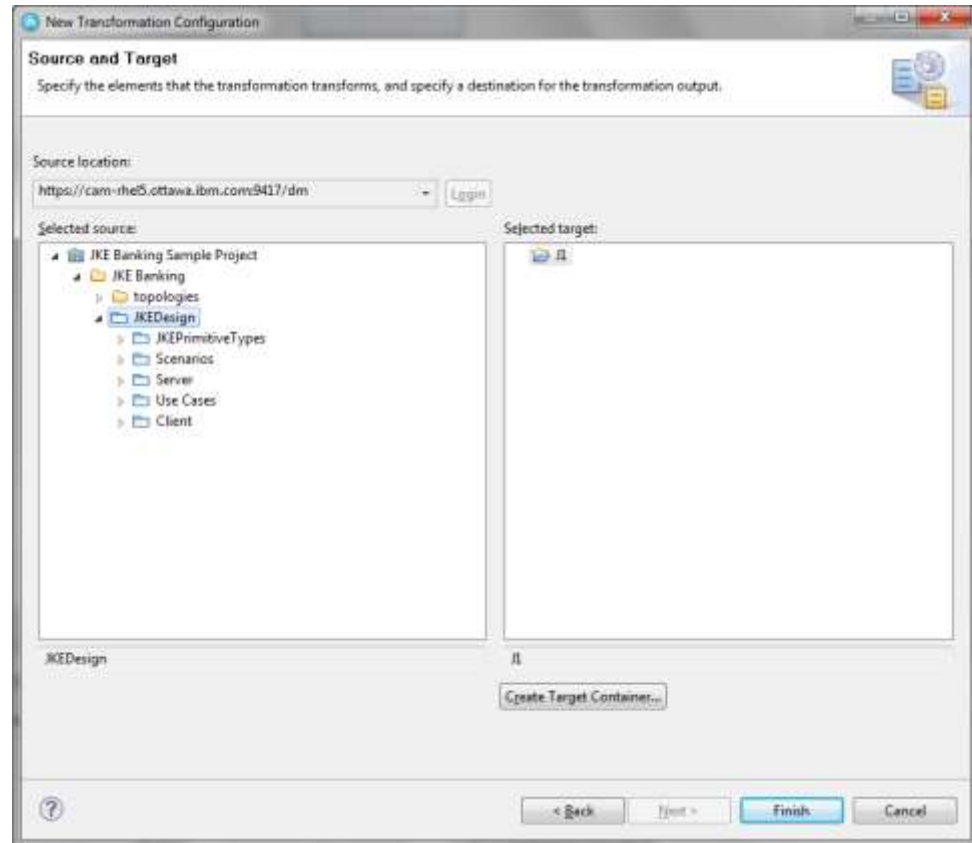
Search Improvements

- Cross project searching
- Query based searching



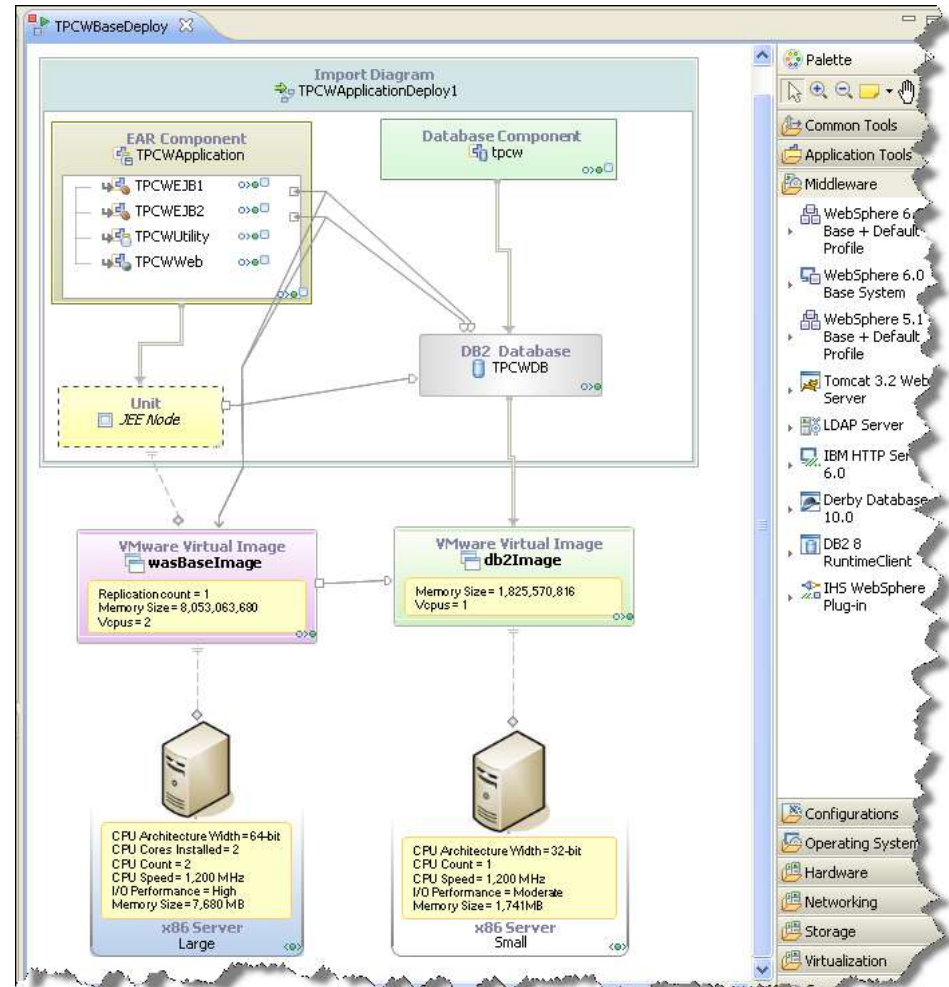
RSA Transformations

- Client side transformations against repository based designs
- Integration with RTC Build Engine

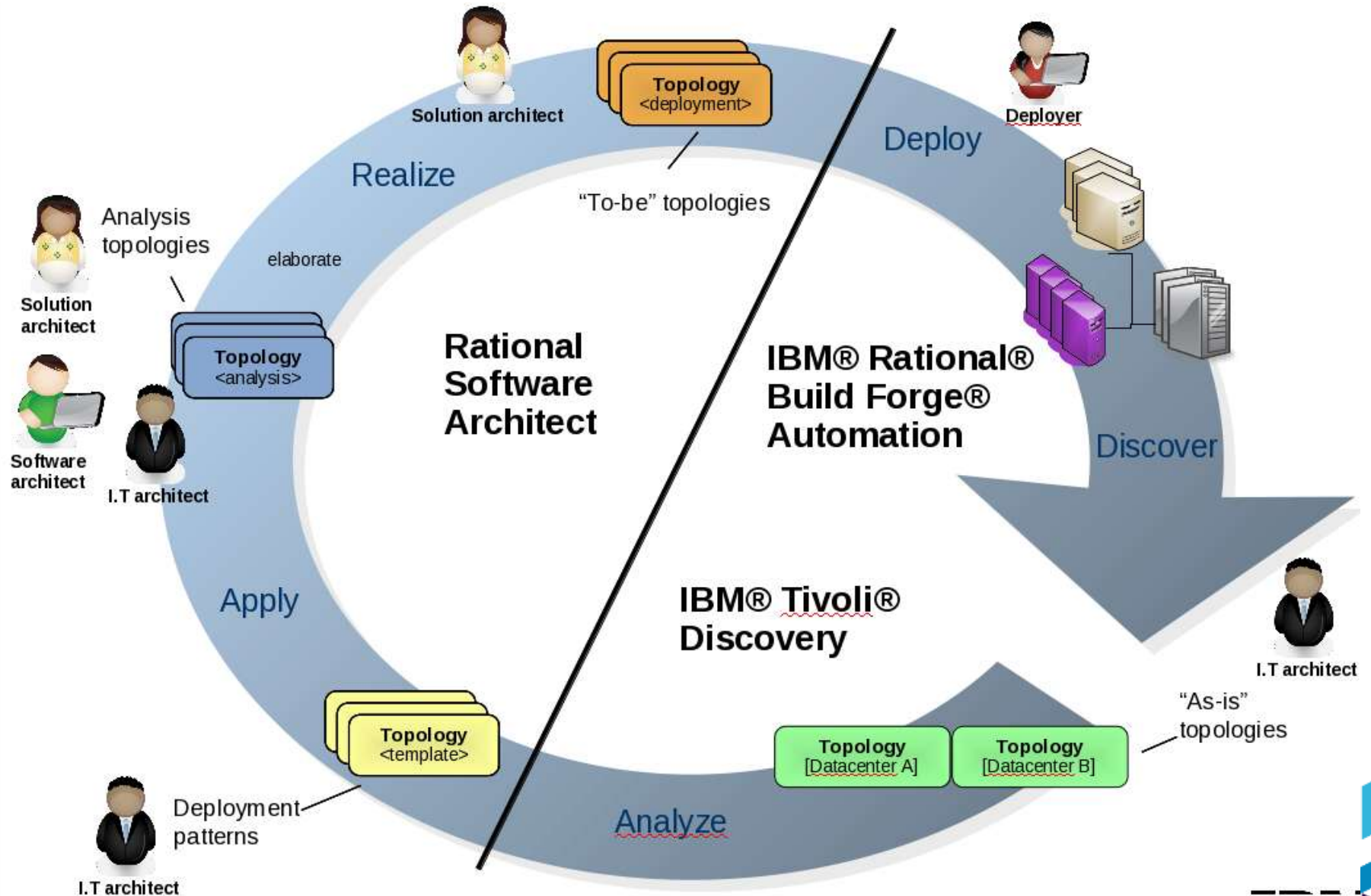


The IBM Rational Deployment Architecture Platform

- The IBM® Rational® Deployment Architecture Platform includes:
 - Smarter IT deployment topology design
 - Communicate and validate IT deployment designs to avoid costly problems late in the application lifecycle
 - Use technology-specific models and rich diagramming tools to construct topologies
- Topology template design and reuse
 - Define datacenter building blocks to quickly and easily create datacenter topology designs
- Deployment automation planning
 - Select, populate, and execute the automation tasks necessary for provisioning a topology design
- Datacenter discovery
 - Integrate with IBM® Tivoli® Application Dependency Discovery Manager to create topologies from live configuration data, which can be used as a starting point to design changes

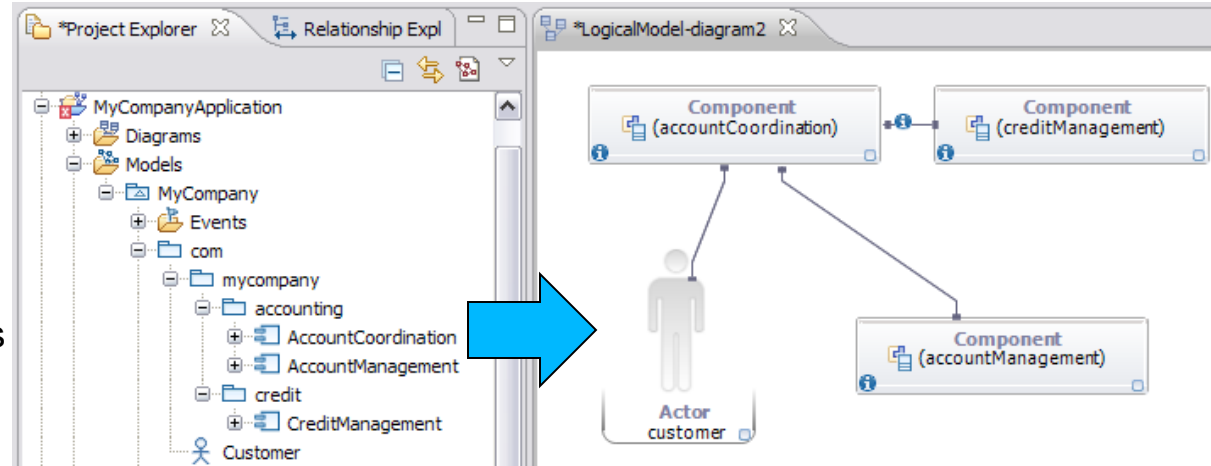


Phases of Deployment Architecture



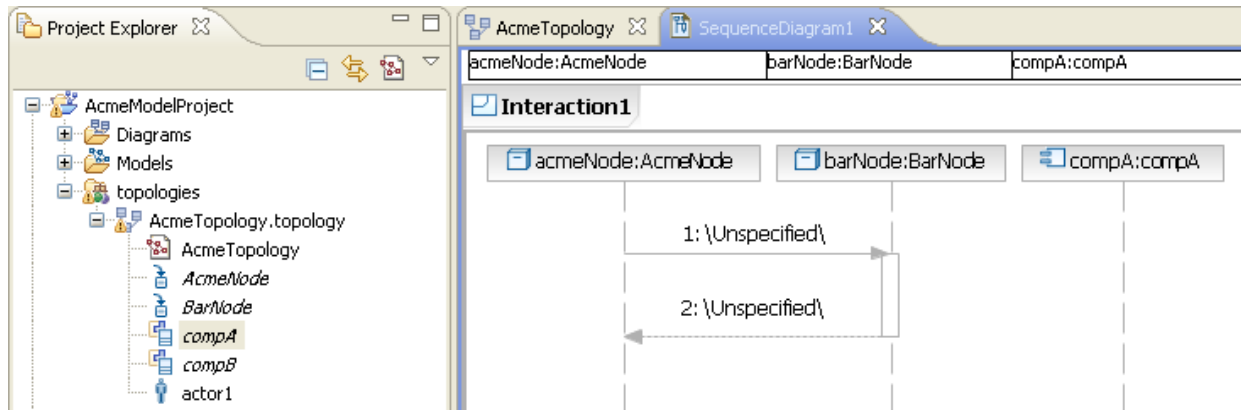
UML interoperability

- Reflect UML modeler elements into a deployment topology
 - Components and actors
- Validate reflected elements
 - Mismatched relationships
 - Mismatched stereotypes
- Quick-fixes to automatically resolve validation errors

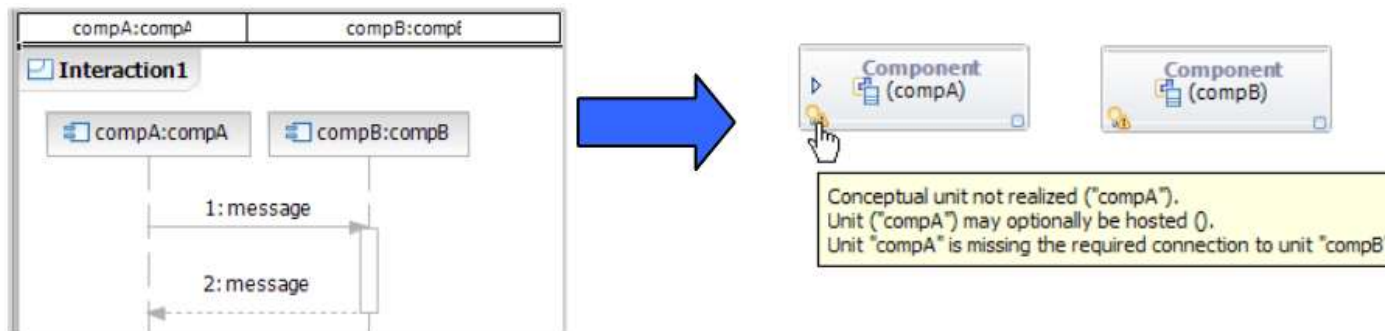


UML interaction models are enforced

- Deployment topology units may be visualized in UML interaction diagrams



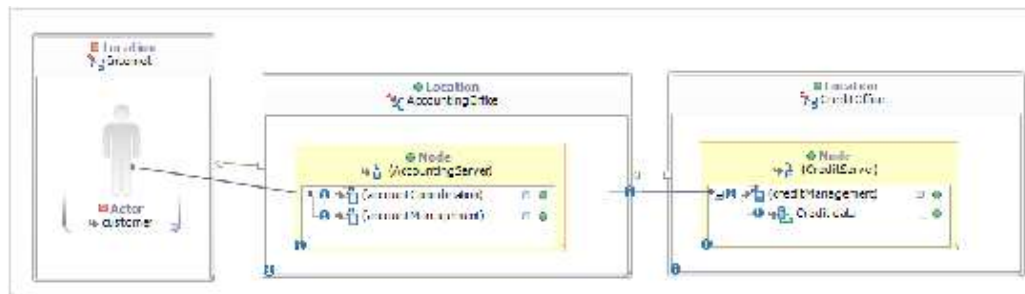
- Topologies may then be constrained by the UML modeled communications
 - Validate relationships prescribed in a sequence or interaction diagram



Model at the appropriate level of abstraction

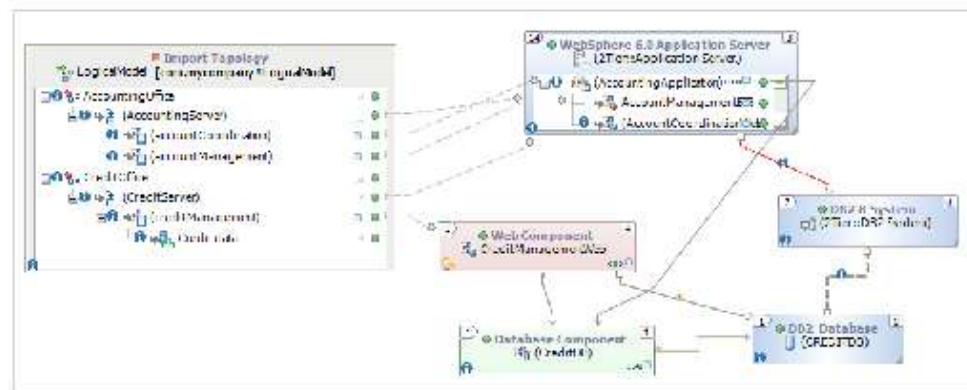
Logical modeling

- Analyze the problem



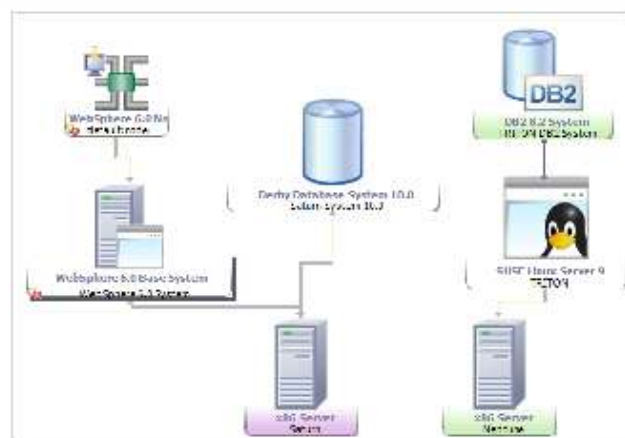
Physical modeling

- Capture technology choices



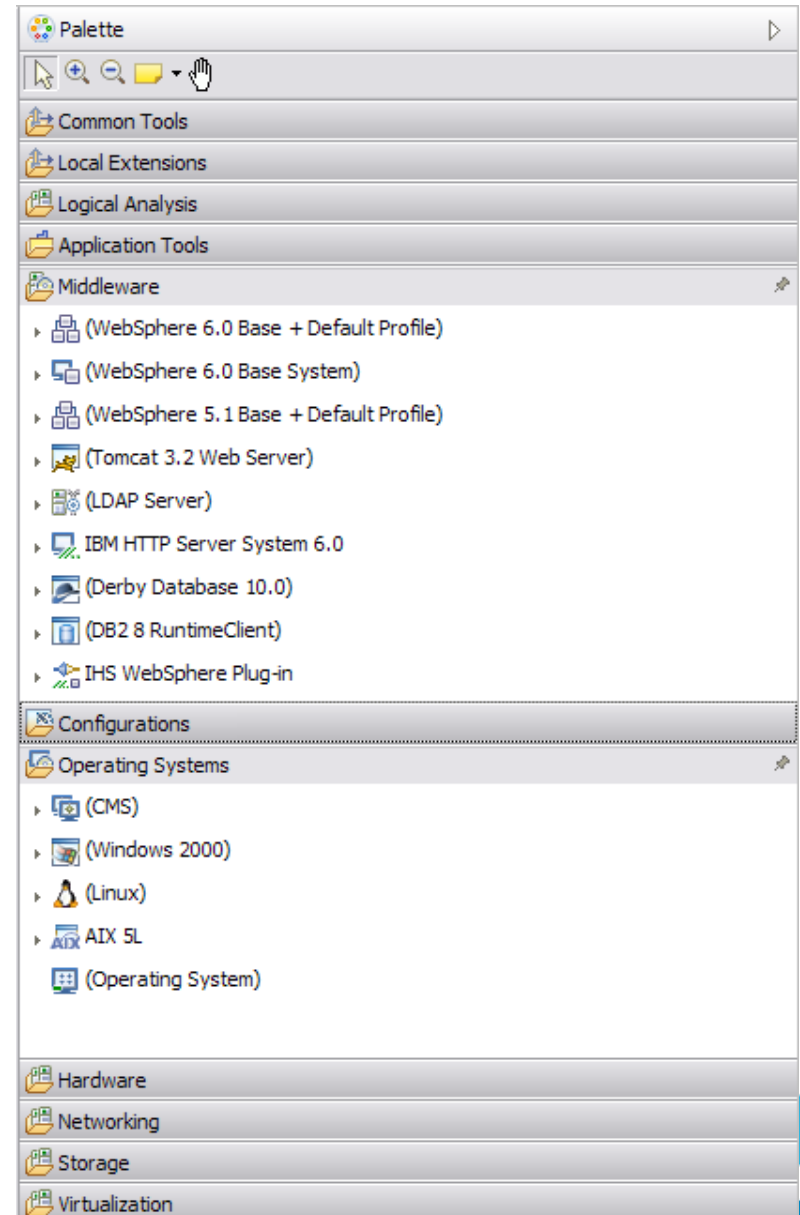
Deployment instance modeling

- Represent existing infrastructure



Domains

- Capture technology-specific capabilities and requirements
- Define templates or building blocks for constructing topologies
- Capture domain-specific validations and guidance
- Support for defining dynamic types (user defined extensions)



Topology validation and resolutions

- Validation statuses represent issues with a topology.
- Resolutions exist to correct validation statuses.

A validation status exists with a warning status. The light bulb indicates that resolutions exist.

Selecting the status reveals resolutions.

Double-click a resolution to execute it.

Containing text: | [X] [Warning] [Info] [Dropdown]

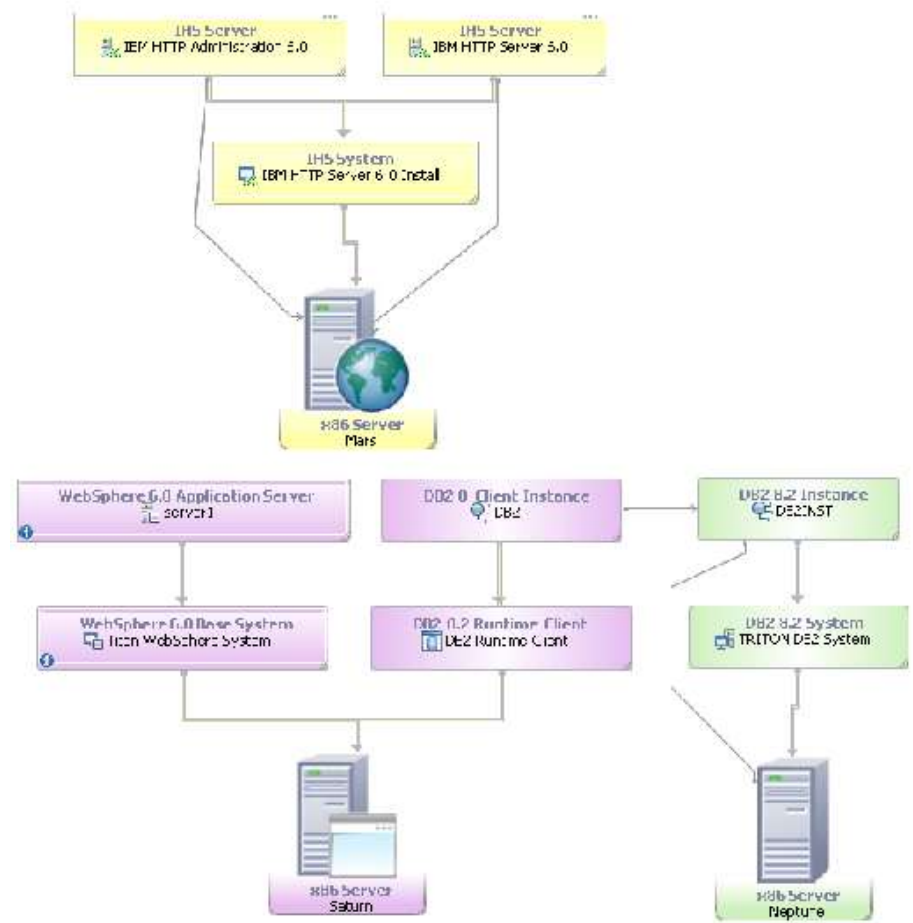
- [Warning] Unit "compA" is missing the required connection to unit "compB"
- [Info] Conceptual unit not realized ("compA").
- [Info] Unit ("compA") may optionally be hosted ().

[Green Arrow] Create communication constraint link from "compA" to "compB"

Click on error to see resolutions. Close

Infrastructure example: WebSphere & DB2

- Model multiple hosting stacks and their dependencies
- Under the diagram surface, the model captures configuration details for IBM® HTTP Server, IBM® WebSphere® Application Server, and IBM® DB2®



QUESTIONS

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