



## IBM Innovate 2012

Revolutionizing Design with  
IBM Rational Software Architect (RSA) and  
RSA Design Manager

Sairam Bantupalli  
Senior software Engineer, IBM Rational  
[sairam.bantupalli@in.ibm.com](mailto:sairam.bantupalli@in.ibm.com)

IBM Software

# Innovate2012

The Premier Event for Software and Systems Innovation

Next  NOW!



## Please note

IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion.

Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision.

The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for our products remains at our sole discretion.

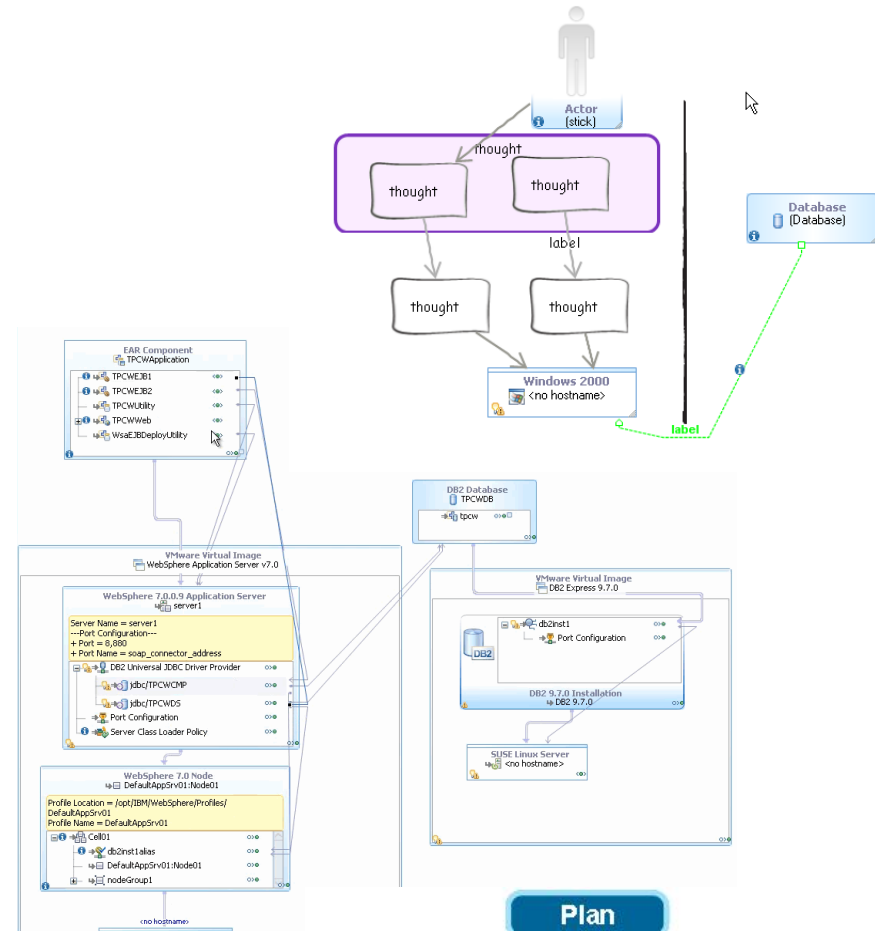
Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput or performance that any user will experience will vary depending upon many factors, including considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve results similar to those stated here.

## Agenda

- Introduction
  - RSA
  - Design Management
- DM 4.0 Architecture
- DM and VVC
- Importing Designs into DM
- Design resources managed in RSA DM
- Design Collaboration
- Integrating design resources with other lifecycle resources
- Change sets in RSA client
- Impact analysis and traceability

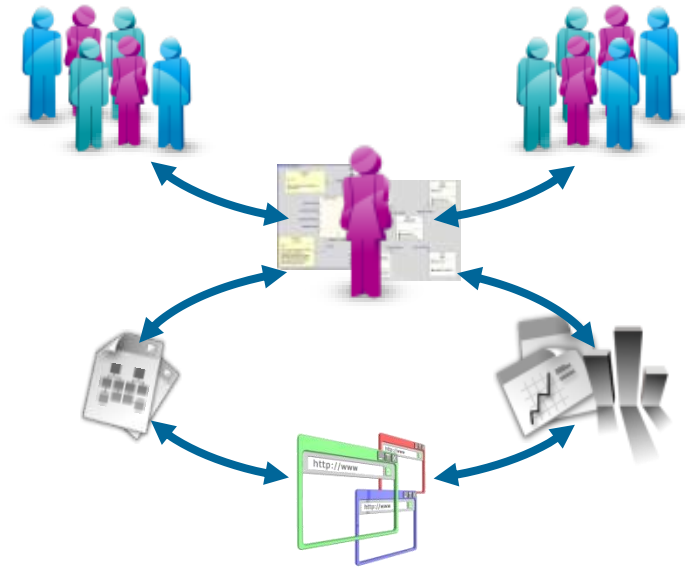
# IBM Rational Software Architect

- Agile Sketching** provides free form modeling capability enabling Agile development. Teams can quickly sketch out thoughts and convert to UML as more formality is needed.
- Software modeling and Model Driven Development with UML** allowing teams to communicate designs and generate code. Support for a variety of domains including UML2, BPMN2, Java/JEE and more)
- Analyze and walk through scenarios before implementation with model simulation** that animates and simulates functionality and behavior.
- BPMN2** tooling allows business plans and goals to be directly incorporated into application architecture and design and the interchange of BPMN2 with other tools like WebSphere Lombardi and Rational System Architect
- Service modeling and SOA Support** allows architects to visualize SOA functionality plus guidance on process and pitfalls of candidate service identification and service and solution specification.
- Model software deployments and generate automation workflows** from deployment plans for Rational BuildForge or Rational Automation Framework for WebSphere (RAFW) with **Deployment Planning and Automation**



# Design Management

- ✓ **Design Management** is an ALM and discipline that integrates software design into the lifecycle
- ✓ Just like requirements management, change & configuration management, and quality management
- ✓ **Rational Software Architect** is IBM Rational's industry leading software design solutions
- ✓ Design Management capabilities have been added to RSA product to enhance its design capabilities with **new team collaboration and lifecycle capabilities**

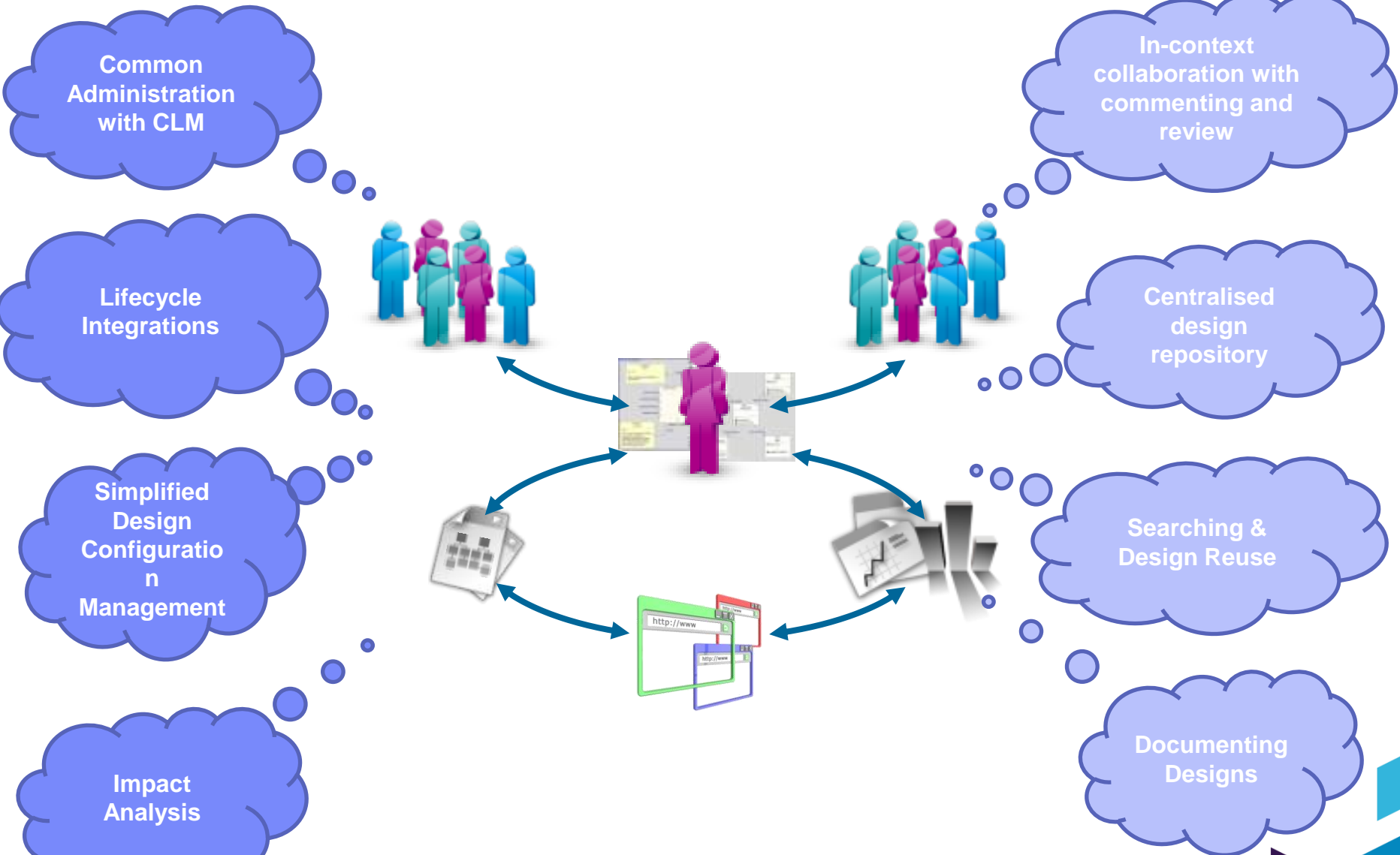


# Design Management

- Increase **team knowledge** through an enterprise and system-wide software design repository
- Analysts, testers, and other extended team members can **access designs through a Web client**
- Designs become URL addressable
- Search across all of the organizations existing designs to **discover knowledge**
- Stay connected with ongoing design activities via **dashboards**
- Navigate designs and **visualize relationships**

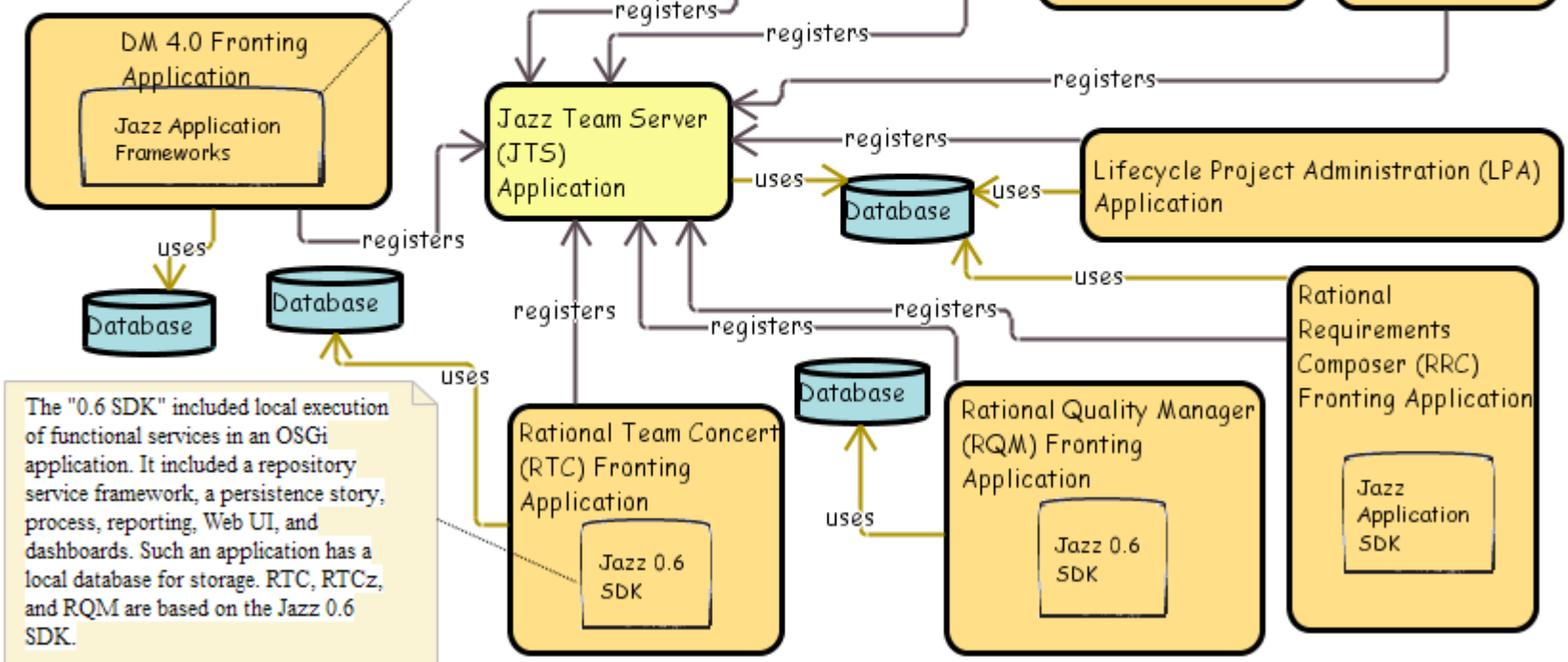
The screenshots illustrate the Rational Collaborative Architecture Management (RCAM) web client interface. The top screenshot shows the 'JKE Banking' dashboard with a 'Welcome to Rational Collaborative Architecture Management' message and a 'Recent Comments' sidebar. The middle screenshot shows a 'Demo Project' view of a 'Sequence diagram' for '806: Account Details', featuring a UML diagram with participants like 'JKE Client' and 'JKE Server' and messages like '1: account details' and '1: get organization'. The bottom screenshot shows a 'Search Results for server' table with columns for Name, Long Name, and Modified date, and a 'Quick Search' dropdown menu.

# RSA Design Management 4.0



# DM 4.0 architecture

In 2012, the preferred approach for building applications on JAF is changing. Instead of creating fronting applications that consume functional services from a shared JTS, applications will embed the functional services and invoke them locally. There are a number of advantages to this approach, including reducing the load on the JTS and unifying two SDK stories into one. The JAF SDK is essentially the 0.6 SDK, with some compatibility and transition add-ons to aid applications which are currently build on the Application SDK. Applications will continue to use the JTS for integration services. To help avoid confusion, we will avoid referring to this as the "Application SDK", calling it instead the "JAF SDK".



The "0.6 SDK" included local execution of functional services in an OSGi application. It included a repository service framework, a persistence story, process, reporting, Web UI, and dashboards. Such an application has a local database for storage. RTC, RTCz, and RQM are based on the Jazz 0.6 SDK.

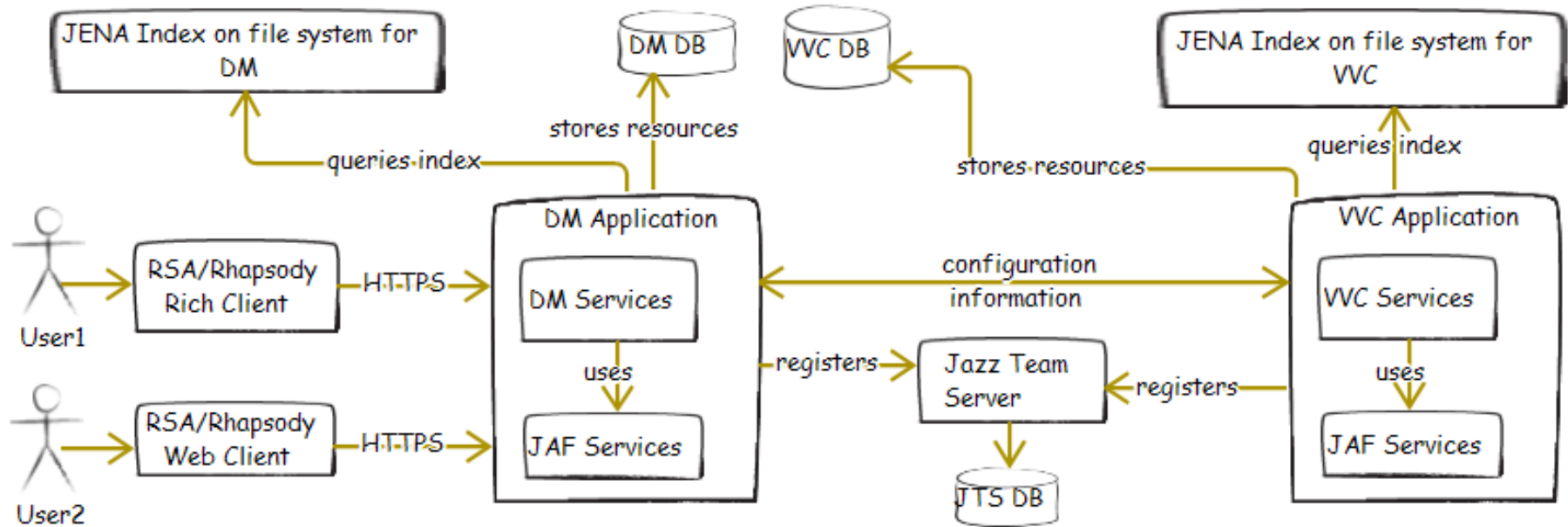
DM 4.0, VVC, RELM, LQE and CLM 4.0



## DM Workspaces and VVC

- VVC maintains versions for Jazz resources (model elements)
- A unique set of versions is called a **Configuration**
- A group of Configurations is called a **Configuration Space** (or Space for short)
  - Spaces allow you to group together related Configurations
  - Each DM project area can be associated with a Space
  - Multiple Project Areas can be related to the same Space and therefore share Configurations
- A **Workspace Configuration** (or Workspace for short) is one where users can modify the set of versions for each resource.
- A **Snapshot Configuration** (or Snapshot for short) is one where users can only view the set of versions for each resource.

# DM 4.0 and VVC 4.0 - Application Interactions

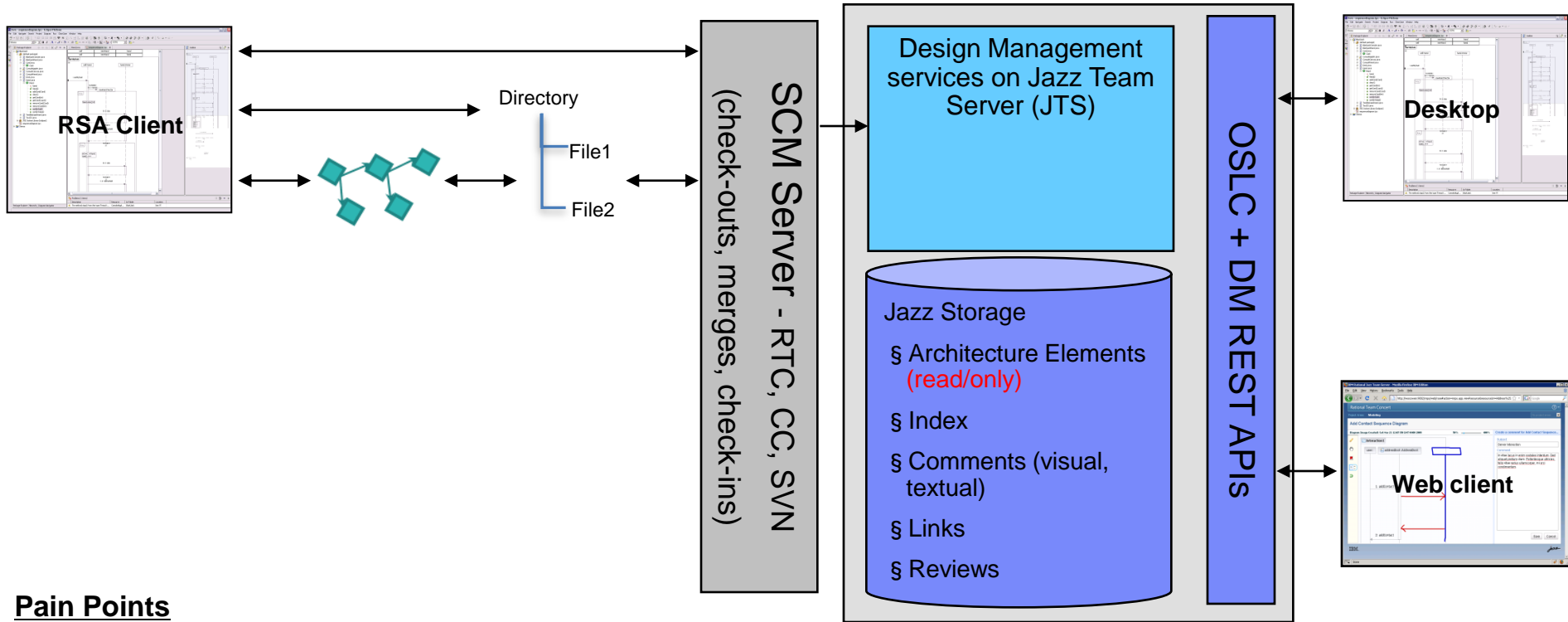


# Design Management – Importing Designs

Creation, editing, MDD, search, query, validate, analyze, report

Design change control and versioning (file-based)

Design search, query, view, comment, review, link, report, validate, analyze



## Pain Points

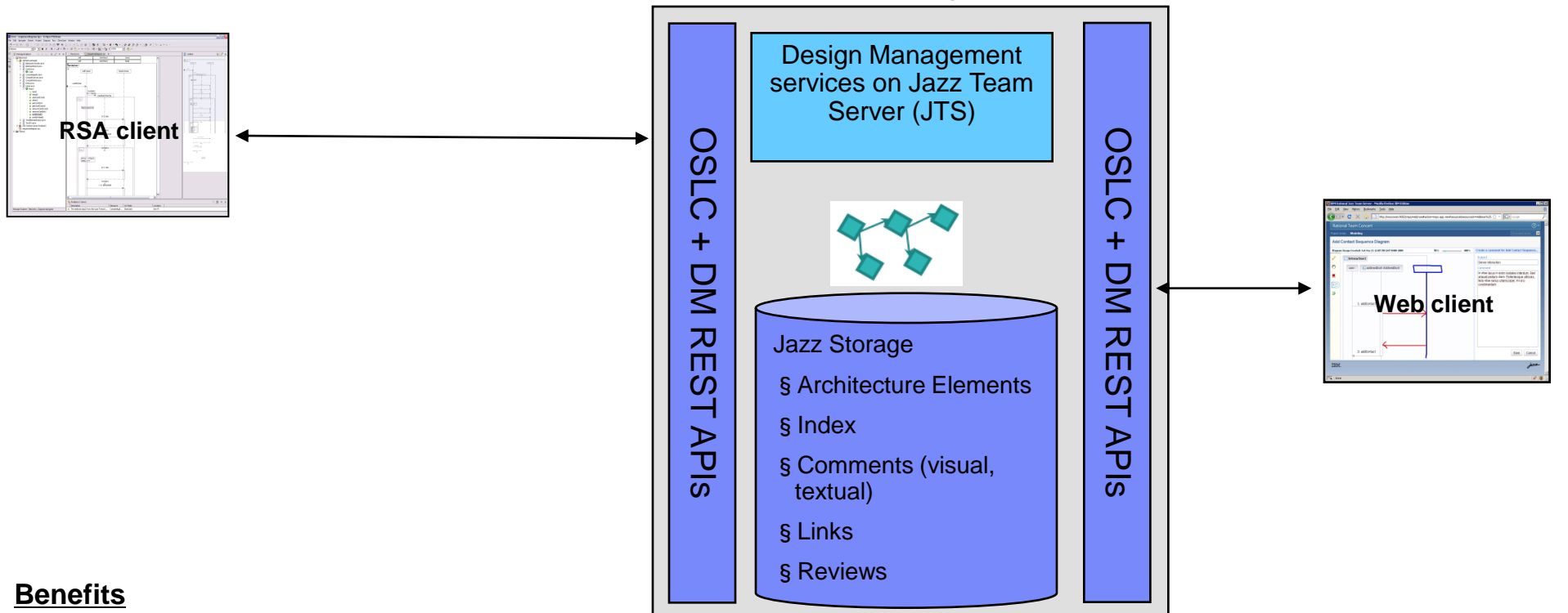
- Mapping models into files for persistence and change control
- Comparing and merging changes in file-based SCMs
- Two steps process to get models into DM (check-into SCM then import into DM)

# Design Configuration Management

**Design creation, editing, MDD, search, query, validate, analyze, report**

**Design change control and versioning (model-based)**

**Design search, query, view, comment, review, link, report, validate, analyze**



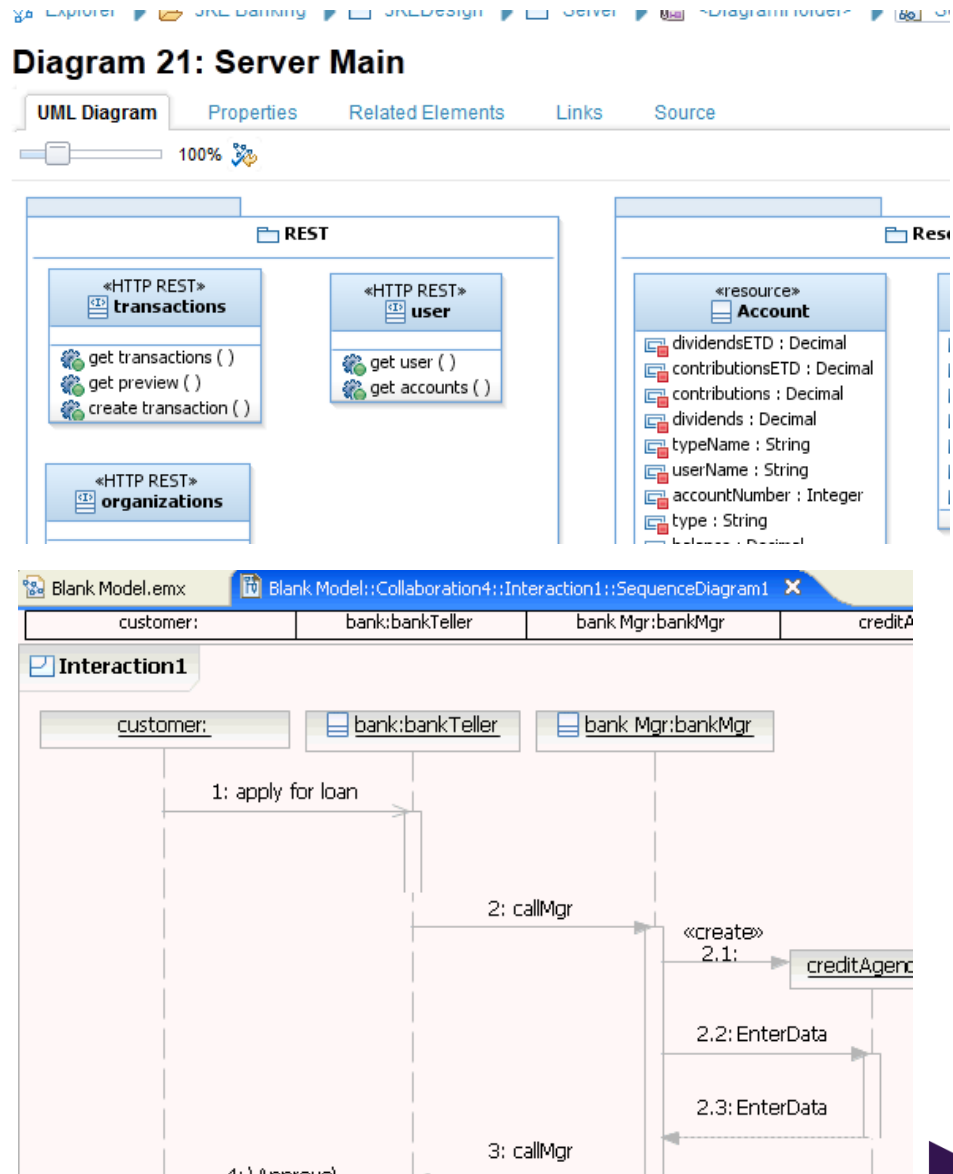
## Benefits

- Direct editing of designs and change control on server providing a more simplified environment
- Change control (locking, history) at the model resource level providing more granularity and
- No duplication or design synchronization issues
- Use of SCM still available for users who need more powerful change control capabilities

# Designs Managed in RSA DM

## ▪ RSA Created Resources - UML

- Use-case models provide detailed information about the behaviors of the system or software application that you are developing. **Use-case diagrams and activity diagrams**
- The analysis models describe the structure of the system or application that you are modeling. It consists of **class diagrams and sequence diagrams** that describe the logical implementation of the functional requirements that you identified in the use case model.
- The design model builds on the analysis model by describing, in greater detail, the structure of the system and how the system will be implemented. In the design model, packages contain the design elements of the system, such as design classes, interfaces, and design subsystems, that evolve from the analysis classes. Within each package, **sequence diagrams** illustrate how the objects in the classes interact, **state machine diagrams** to model the dynamic behavior in classes, **component diagrams** to describe the software architecture of the system

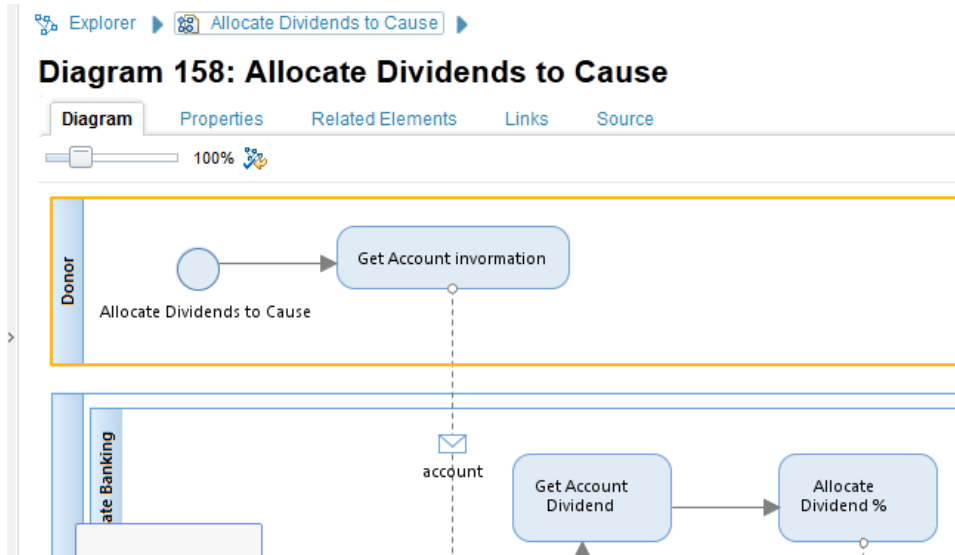


# Designs Managed in RSA DM

## ■ RSA Created Resources

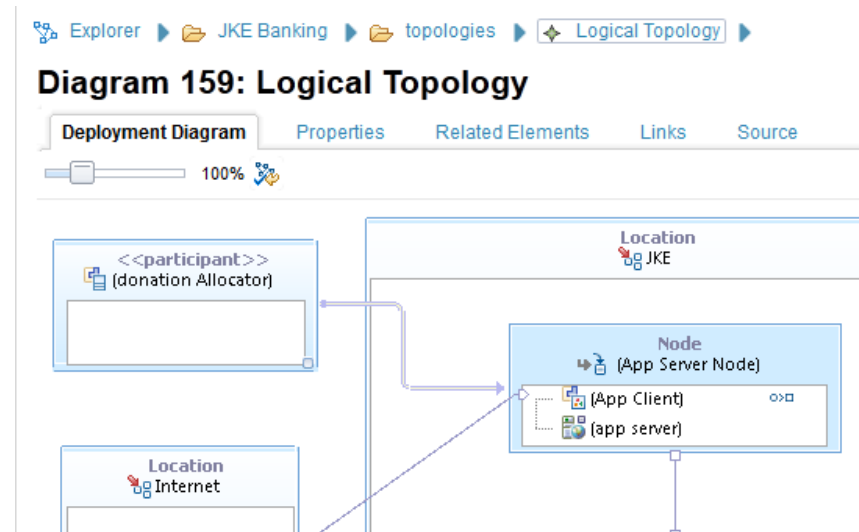
### – BPMN

- You can use **Business Process Model Notation (BPMN) diagrams** to create graphical representations of internal business processes and collaborations with other business processes.



### – Topology

- You can use **deployment diagrams** to model the physical layout or topology of a system. Deployment diagrams describe the configuration of runtime processing nodes and the artifacts that are deployed on them.



# Designs Managed in RSA DM

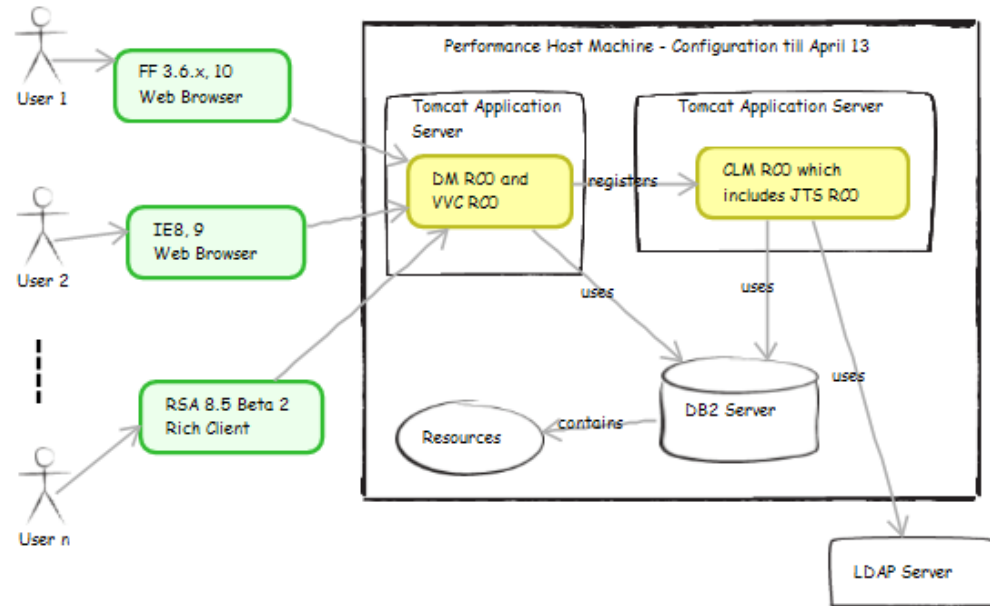
- RSA DM Created Resources

- Sketch

- Sketches are simple, independent diagrams. Sketches can illustrate any technology-related or business-related interaction at a high level of abstraction.

- Rich Text

- Documents are rich-text artifacts that you use to capture text-based content. Document capabilities include controls for text styles, paragraph justification and indentation, bullets, and links.



Explorer ▶ SampleFolder ▶ undefined ▶

### Document 320: Design Document

Properties | Related Elements | Links | Source

Title: Design Document Folder: SampleFolder

**Body**

Format Normal Font Arial Size 10 B I U S x+ x- [Icons]

The protocol that states that Conceptual Models Drive Development provides the most strict design control of the desi contract management protocols. Architectural changes are implemented in the conceptual model , which is then transformed into the code implementation. ***This provides strict control and governance, where the architect maintains a high degree of control and the system developers role changes from application developer to tooling developer.***

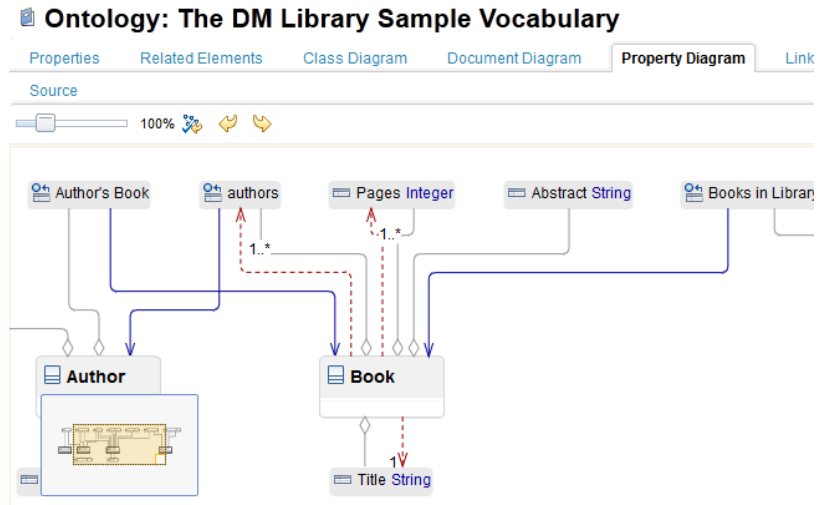
***This technique involves using the conceptual model on an ongoing basis to drive the development of an applicati and supports the notion of round-trip engineering*** After an architect has created a detailed class-level model using

# Designs Managed in RSA DM

- RSA DM Custom Resources
  - Define ontology of resources
  - Form based editing
  - First class resources, linkable, commentable, reviewable

The screenshot shows the 'Domains' menu in RSA DM. The menu is open, displaying various options for managing designs and resources. The options are categorized into 'Browse', 'Create', 'Create Design Resource', and 'Upload'.

- Domains**
  - Designs
  - Reviews
  - Analysis
- Welcome to Designs**
- Browse**
  - Pinboard
  - Explorer
  - Queries
  - Viewpoints
  - Validation
- Create**
  - Viewpoint
  - Query
- Create Design Resource**
  - Document
  - Domain
  - Editor Constraint
  - Editor Definition
  - Folder
  - Model Constraint
  - Ontology
  - Sketch
- Upload**



The screenshot shows the 'Domain: Examples Domain' interface. It includes a 'Properties' tab and a list of model constraints and document classes. The list includes 'Model Constraints', 'Top Level Document Classes', 'Book', 'Library', 'Author', 'Ontologies\*', 'Editor Definitions', and 'Related Elements'. Each item has an 'Add...' or 'Select All...' button.



# Design Collaboration

## Collaborating with Stakeholders in the Context of Designs

Different types of design collaboration may be required depending on the amount of formality required:

### *Formalization*



#### Design Collaboration

- Ongoing stakeholder involvement in the design process.
- Starts early in the process and stakeholder input helps to shape the evolution of the design.
- Improve quality and gain stakeholder buy-in

#### Informal Design Reviews

- Gather feedback from stakeholders on a specific set of designs at a point in time such as a milestone.
- Review occurs over a limited period of time.
- Does not typically require formal signoff on designs.

#### Formal Design Reviews

- Obtain approval for designs or identify issues that must be resolved before approval can be given.
- Review occurs over a limited period of time
- Requires tracking of formal signoff on designs.



*Time, effort, & costs increase*

# Design Collaboration

- Engaging team members in the design process with Web client access to designs
- Improve quality with in-context design collaboration through commenting and visual markup
- Automate manual and time consuming design reviews with a more guided process
- Comments can be posted and accessed from Web client and RSA desktop client

The screenshot displays the IBM Design Management (Jdm) interface. At the top, it shows the 'Demo Project' and user 'Don Yantzi'. A search bar contains the text 'http://www.pcmag.com/article2/0,2817,2411002,00.asp'. The main area shows a sequence diagram titled '\*777: Login Unsuccessful' (modified Sep 21, 2011 9:09:00 AM). The diagram involves three lifelines: 'kgreen:User', ':JKE Client', and 'jKE Server'. The sequence of messages is: 1: login (User to Client), 1.1: get user (Client to Server), 1.2: 404 Not Found (Server to Client), and 2: Invalid login (Client to User). A red oval highlights the '2: Invalid login' message. On the right, a comment box is open for 'Login Unsuccessful' with the subject 'Lockout Question' and the comment text: 'Will the user be locked out after a certain number of failed attempts?'.

# Automate Design Reviews

- Automate manual and time consuming design reviews
- Users notified via email of the review and access their reviews from the dashboard
- Design Manager tracks progress of design review
- Link review to Team Concert work items for more formalized approvals

When & Why

Who

What

The screenshot shows the 'MyReview' interface with the following sections:

- Overview:** Includes tabs for Overview, Participants, Resources, and Links. A progress bar shows stages: Draft, Start Review, In progress, Reviewed, and Finalized.
- Review Details:**
  - Name: MyReview
  - Due: Apr 1, 2011
  - Instructions: Please Review
  - Snapshot: No snapshot (current)
- Participants Table:**

Name	Role	Review results	Completed	Actions
Julian Jones	Reviewer	0 ✓ 0 ✗ 2 ⌚	0%	
jim conallen	Reviewer	0 ✓ 0 ✗ 2 ⌚	0%	
- Resources Table:**

Name	Description	Actions
Main	Main Diagram	
JKEClientApp	Application Interface	

# Collaborative development in RSA Desktop Client

The screenshot shows the Rational Software Architect interface with several callouts highlighting key features:

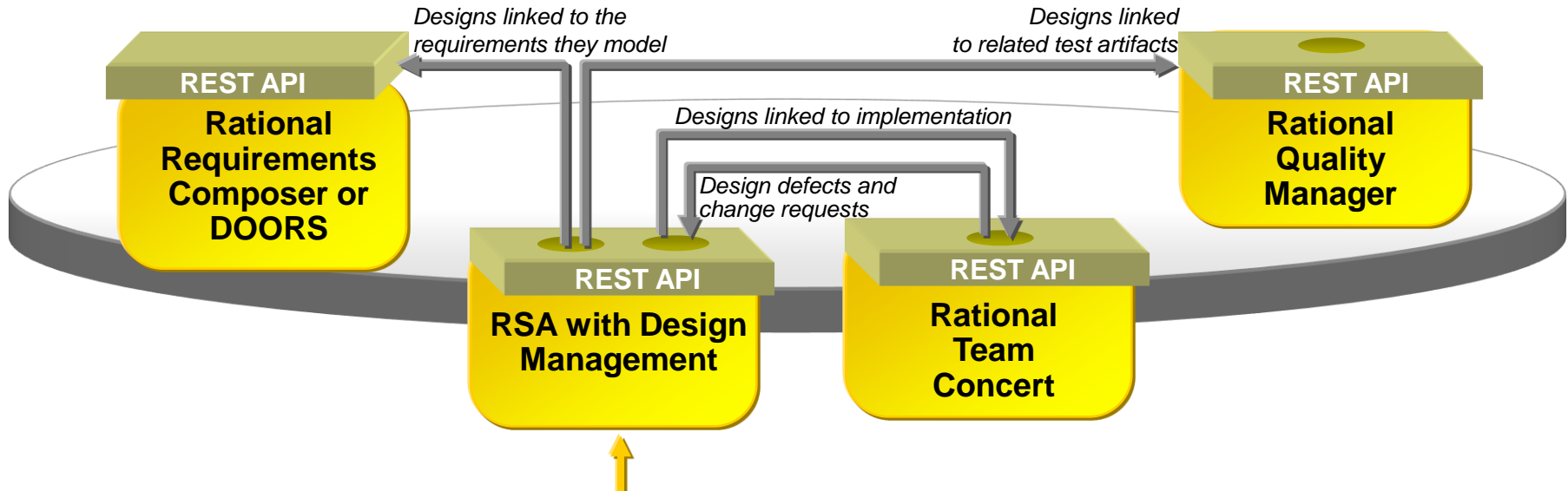
- View markup associated with comments:** A red circle highlights a specific element in the design diagram.
- View design comments:** A callout points to the 'Comments' panel on the right, which displays a comment from 'Joe Stakeholder' about server logging persistence.
- Connect to DM servers, navigate server projects, and preview designs from server:** A callout points to the 'Server Connections' panel at the bottom left, which lists various server environments.
- View OSLC link information including pop-up previews:** A callout points to the 'Links' panel at the bottom, which shows a list of OSLC links and their details.
- Search across design projects:** A callout points to the 'Search' panel at the bottom right, which displays search results for 'Account class'.

# Dashboards

- Dashboards provide a quick way to stay on top of project activity
- DM dashboard viewlets for collaboration (recent links, comments, most active, design reviews)
- Create mashup dashboards with viewlets from CLM & DM applications

# Lifecycle Traceability

Integrating Software Designs with the Application Lifecycle

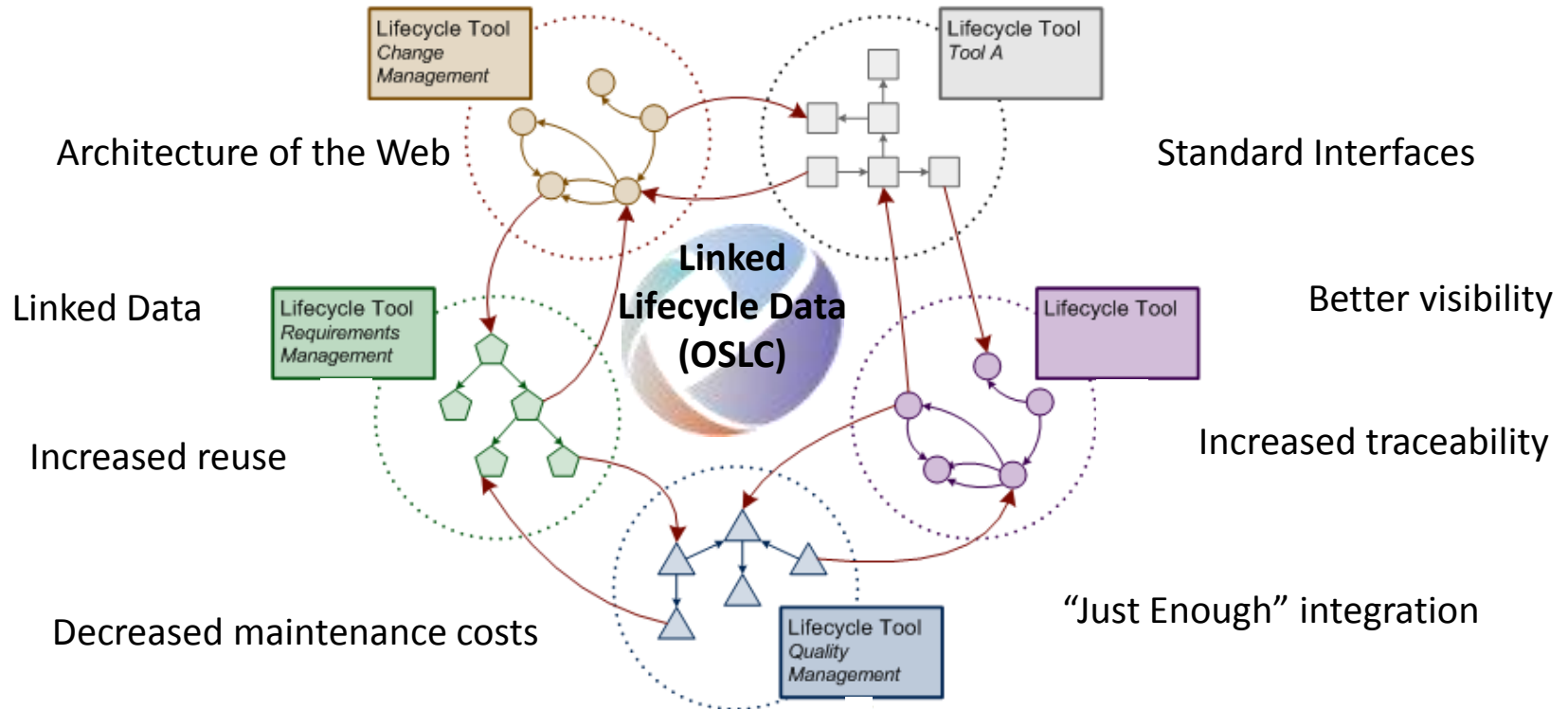


Architect

- Link designs to other lifecycle artifacts and model elements
- Link designs to requirements, work items, and test artifacts
- Keep stakeholders informed on how their work relates to designs
- Understand impact of design changes
- Ensure traceability through the lifecycle

# OSLC's Innovative Solution

Users can work across the integration without leaving their favorite tool



*Links to where the data lives as opposed to copying and synchronizing*

# Linking Designs to Lifecycle Artifacts

**Diagram 52: JKE Overview**

UML Diagram Properties Related Elements **Links** Source

Add: Derives From

Elaborates

- BRM Sprint 2 (1.0) Plan  
Represents sprint 2 design

Derives From

- 95: Core Functionality

Incoming Links

- JKE Banking (Change Management)
- JKE Banking (Quality Management)
- JKE Banking (Requirements Management)

Owner: Business Recovery Matters  
Iteration: Sprint 2 (5/30/12 - 6/12/12)  
0/278hrs

Show More

Compact rendering available for requirements, work items, and test artifacts

Links from a design resource can be viewed on the Links tab in the Web client and properties view in RSA

Design Management (/dm)

JKE Banking (Design Management)

Project Dashboards Designs Reviews Analysis Import

Search Designs

Save Run

My Impact Analysis-May 30, 2012 4:46:15 PM

Force-Directed

Impact Analysis Definitions

Target Element: JKEDesign  
Max Depth: 2  
Type: All  
View Type: By Structure

Navigation Tree  
Element Properties  
Removed Elements  
Added Elements

Links are also shown in the analysis diagrams alongside other model relationships



# Viewing Designs from an Work Item

**Task 75** ?

Summary: \* Implement server logging In Progress

Overview Links

**Attachments**

Add File:

No Attachments.

**Links**

Add: Related

**Elaborated by Architect**

[711: JKE Overview](#)

**711: JKE Overview**

**Project Name:** Demo Project  
**Long Name:** [JKEDesign] JKEDesign::JKE Overview  
**Type:** UML2 Modeler - Freeform UMLDiagram  
**Modified:** Jun 28, 2011 10:04:02 PM  
**Last Comment:** no comments

```
graph TD
    Donor[donor] --> Client[client]
    Client --> SystemBoundary
    subgraph SystemBoundary
        Logic[logic]
        Beans[beans]
        Persistence[persistence]
        Logic --> Beans
        Logic --> Persistence
        Beans --> Persistence
    end
    Persistence --> DB2[(DB2)]
    Persistence --> WAS[WAS]
```

Same work item is linked back to the design resource. Hovering over the design resource link shows pop-up dialog with details of design resource or diagram.

# RSA Client and Changesets

- Changes made to RSA UML resources are organized into changesets that can be associated with RTC work items.

The image displays two overlapping screenshots. The background screenshot is from Rational Software Architect, showing a UML diagram titled "Allocate Dividends to Cause". The diagram includes elements like "Donor", "Get Account Information", "Get Account Dividend", and "Provide Secure Profile Info to Access Account". A blue callout box on the left points to the "Design Changes" pane, which lists "84: Add external logging" as a change. The foreground screenshot is from the Change and Configuration Management (CCM) console, showing a "Task 84" with the summary "Add external logging". Under the "Links" section, there is a "Change Sets (Remote)" link with the URL "https://rsa-jade2k8.ottawa.ibm.com:9430/dm/editingsessions/156". A blue callout box on the right points to this link.

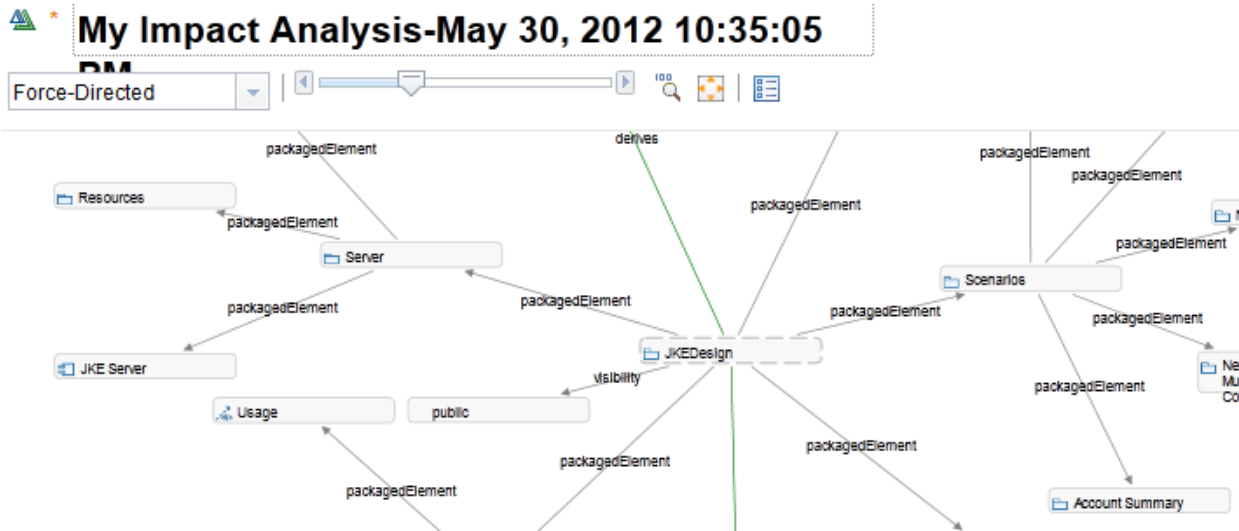
DM managed changesets associated with RTC work items appear as Remote changesets.

DM managed changesets

# Impact Analysis and Traceability

## Impact Analysis




- You can use traceability and impact analysis capabilities to examine model element relationships, to clarify their purpose, or to minimize the risk of change. You can query model elements for trace relationships to discover how the elements in a model are related and you can view and explore the results of traceability queries in a diagram.
- Main Use cases
  - User creates impact analysis diagram based on a target element
  - User interactively reviews diagram, pruning, preserving and adding elements
- Additional Use cases
  - User creates an impact analysis configuration



# Impact Analysis and Traceability

- Reports

- Reports can group and aggregate the information to help you draw conclusions about the model.
- You can use the reporting feature to generate reports to help you analyze models, profiles, or package. You control the contents of the report, and can choose the file format.

 \* **Sample Template** \*  

**General**

Description:

JKEBanking Report Template

Specify a unique identifier for this report template.

Identifier:

Share report template with other users

**Contents**

Select a Rational Publishing Engine template file (\*.dta) to set as the contents of this report template

If this is a predefined report template, you can restore its original template contents.

**Additional Files**

# QUESTIONS

[www.ibm.com/software/rational](http://www.ibm.com/software/rational)

## Acknowledgements and disclaimers

**Availability:** References in this presentation to IBM products, programs, or services do not imply that they will be available in all countries in which IBM operates.

The workshops, sessions and materials have been prepared by IBM or the session speakers and reflect their own views. They are provided for informational purposes only, and are neither intended to, nor shall have the effect of being, legal or other guidance or advice to any participant. While efforts were made to verify the completeness and accuracy of the information contained in this presentation, it is provided AS-IS without warranty of any kind, express or implied. IBM shall not be responsible for any damages arising out of the use of, or otherwise related to, this presentation or any other materials. Nothing contained in this presentation is intended to, nor shall have the effect of, creating any warranties or representations from IBM or its suppliers or licensors, or altering the terms and conditions of the applicable license agreement governing the use of IBM software.

All customer examples described are presented as illustrations of how those customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics may vary by customer. Nothing contained in these materials is intended to, nor shall have the effect of, stating or implying that any activities undertaken by you will result in any specific sales, revenue growth or other results.

© **Copyright IBM Corporation 2012. All rights reserved.**

– **U.S. Government Users Restricted Rights - Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.**

IBM, the IBM logo, ibm.com, Rational, the Rational logo, Telelogic, the Telelogic logo, Green Hat, the Green Hat logo, and other IBM products and services are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. If these and other IBM trademarked terms are marked on their first occurrence in this information with a trademark symbol (® or ™), these symbols indicate U.S. registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries. A current list of IBM trademarks is available on the Web at “Copyright and trademark information” at [www.ibm.com/legal/copytrade.shtml](http://www.ibm.com/legal/copytrade.shtml)

If you have mentioned trademarks that are not from IBM, please update and add the following lines:

[Insert any special third-party trademark names/attribution here]

Other company, product, or service names may be trademarks or service marks of others.



[www.ibm.com/software/rational](http://www.ibm.com/software/rational)

© Copyright IBM Corporation 2012. All rights reserved. The information contained in these materials is provided for informational purposes only, and is provided AS IS without warranty of any kind, express or implied. IBM shall not be responsible for any damages arising out of the use of, or otherwise related to, these materials. Nothing contained in these materials is intended to, nor shall have the effect of, creating any warranties or representations from IBM or its suppliers or licensors, or altering the terms and conditions of the applicable license agreement governing the use of IBM software. References in these materials to IBM products, programs, or services do not imply that they will be available in all countries in which IBM operates. Product release dates and/or capabilities referenced in these materials may change at any time at IBM's sole discretion based on market opportunities or other factors, and are not intended to be a commitment to future product or feature availability in any way. IBM, the IBM logo, Rational, the Rational logo, Telelogic, the Telelogic logo, and other IBM products and services are trademarks of the International Business Machines Corporation, in the United States, other countries or both. Other company, product, or service names may be trademarks or service marks of others.