



**Continuous Engineering EcoSystem Day - 28 may 2019**

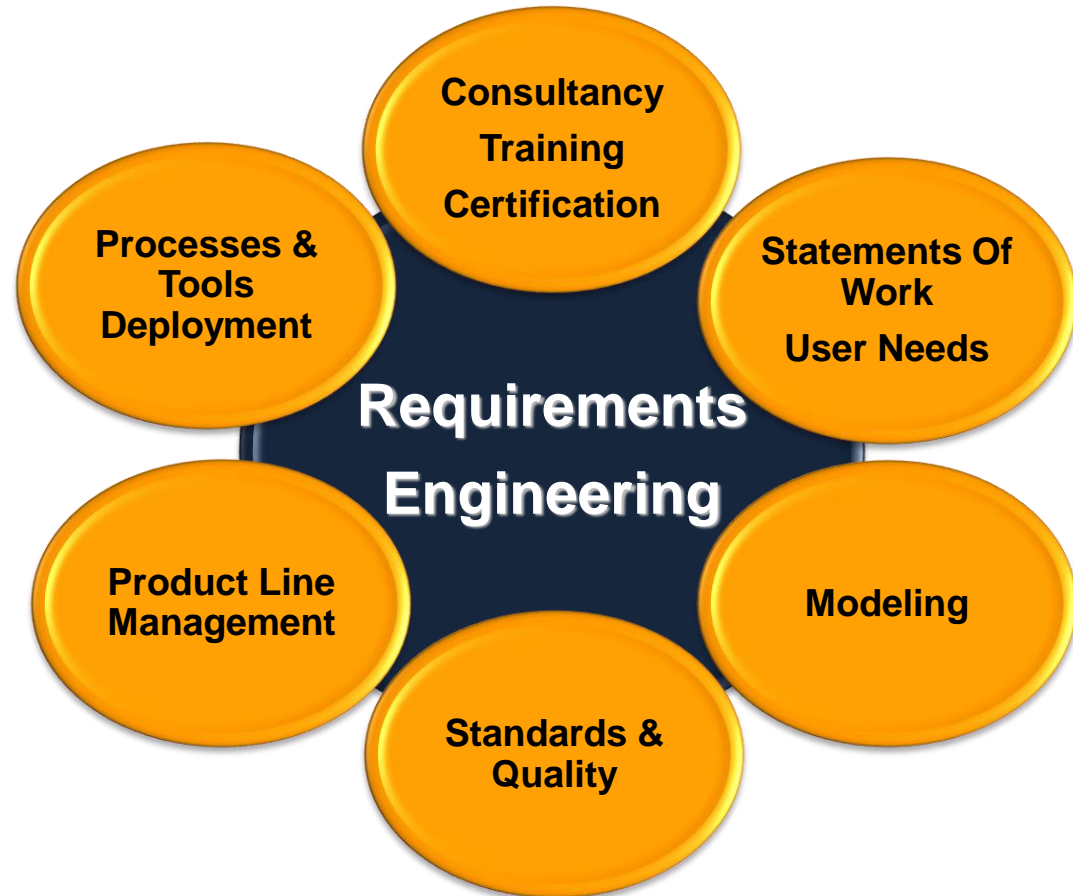
## **BranchManager for DOORS**

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# COMPLIANCE Technologies

- Founded in 2004
- Expertise in Requirements Engineering, and also System & Software Engineering about processes, methods and Tools (DOORS, CLM, Reqtify, Polarion, Enterprise Architect, etc.)
- Control and Improvement of **compliance** and **quality** for **Complex Systems** and **Information Systems**
- IREB Member and Recognized Training Provider



# Customers



# Branch Manager for DOORS



## BranchManager Overview

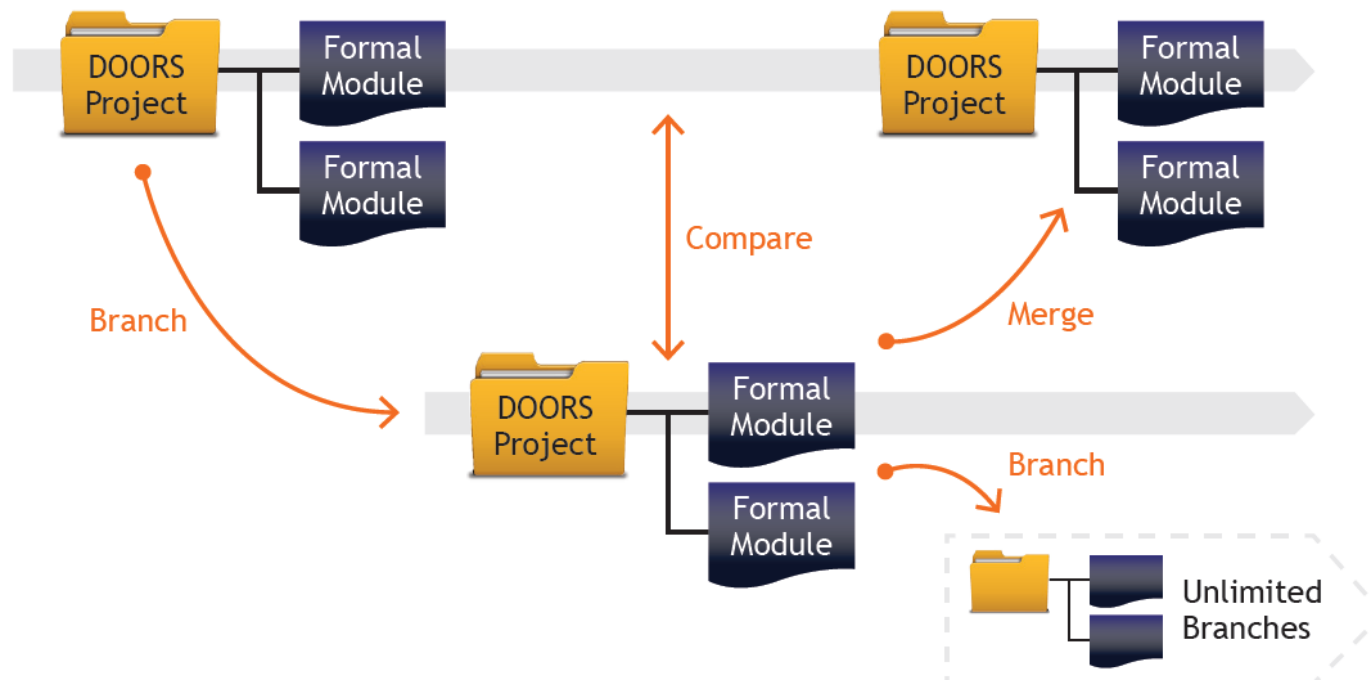
*IT-Base*  
LifeCycle Management

# Overview

- Provide Stream management to Rational DOORS
  - Challenge: Manage similar requirements set across many projects
    - Provide the ability to compare formal modules with differences in content and structure
    - Provide the ability to branch sets of modules as a new stream of requirement
    - Provide the ability to merge changes across branches

## *BranchManager for DOORS Usage*

- *Product Line Engineering*
- *Maintenance Streams*
- *Requirements Library*
- *Personal Sandbox*
- ...



# Branch/Compare/Merge

**Compare Modules - DOORS**

Method:  Compare by Link  Compare by Attribute  Compare with Baseline  Compare with Branch

Target: /IntegrationTest\_BranchA/HRD baseline 2.0 Select Target

Target is:  older (before change)  newer (after change)

Note: A directed comparison is performed, that will yield a difference (before change -> after change)

Match By Common Attribute Options  
Please choose attributes that have unique, identical values in the source and target module.  
Source Attribute: <not applicable> Target Attribute: <not applicable>

Comparison Settings  
Select Attributes To Compare:

Attribute	
<input type="checkbox"/> Editor Name	<input checked="" type="checkbox"/> Show Structural Differences
<input type="checkbox"/> Editor Status	<input checked="" type="checkbox"/> Show Attribute Differences
<input type="checkbox"/> ExpectedResults (De...	<input checked="" type="checkbox"/> Show Link Differences
<input checked="" type="checkbox"/> Object Heading	<input checked="" type="checkbox"/> Show New / Deleted Objects
<input checked="" type="checkbox"/> Object Short Text	<input checked="" type="checkbox"/> Show Deletions / Purged Objects in Predecessor
<input checked="" type="checkbox"/> Object Text	<input checked="" type="checkbox"/> Show Table Differences in Predecessor
<input checked="" type="checkbox"/> Requirement Type	
<input type="checkbox"/> TableBottomBorder	

(Un)Select All  Select Common

Add Comparison Column Show Module Attribute Differences Close

**Integration of HRD - DOORS**

Open Source Source Module: /Base/HRD (current)  
Open Source Base Source Base: /Base/HRD (1.0)  
Open Target Target Module: /IntegrationTest\_BranchA/HRD (current)  
Open Target Base Target Base: /Base/HRD (1.0)

Changes:

- Conflicted Changes
  - object 18 (LS)
  - object 76 (S)
  - object 94 (AD)
- Non Conflicted Changes
  - object 1 (A)
  - object 2 (L)
  - object 7 (U)
  - object 32 (D)
  - object 119 (C)
  - object 68 (S)
  - object 13 (A)
  - object 40 (S)
  - object 12 (S)
  - object 36 (AS)
  - object 39 (S)

Refresh all

A = attribute change, C = create new object, T = picture change, D = (soft)delete object, U = undelete object, L = link change, S = structural change, P = purge object, B = base difference (possible)

Merge Selected Changes Mark Object as Integrated

Settings Abort Integration Finalize Integration

Comparison Finished!

Changes in source module:  
**This object was moved to section 3.1-5.**  
**The attribute 'Object Text' of this object was changed:**  
A normal Object that will be moved to Heading A#

Conflict Information (changes in current Module):

**Start Integration - HRD - DOORS**

Click on 'Start Integration', if you plan to transfer changes, that have been made to a parallel module in another branch to your current module. Note that it can be beneficial to baseline the current module before integrating changes from another branch.

Integration from: /IntegrationTest\_BranchAC Browse

Common Base: /IntegrationTest\_BranchA/HRD (1.0)

Source Module: /IntegrationTest\_BranchAC/HRD

Source Version: current Choose

Compare with Common Base  
 Compare with Integration Baseline

Integration Baseline:

Close

**HRD current 2.0 (INT2012-10-22) in /Base (normal module) - DOORS**

File Edit View Insert Link Analysis Table Tools Discussions User BranchManager Change Management Help

View | Standard view | All levels | Comparison with HRD current | Comparison with HRD (2.0)

ID	1	2	70	71
1	<b>1 Different Change</b>			
2	<b>The attribute 'Object Heading' of object 1 in '/Demo/HRD (current)' was changed:</b> Different Change. Add some change. <b>An object (newer module ID: 149) was added.</b> <b>An object (newer module ID: 150) was added.</b>	<b>The attribute 'Object Heading' of this object was changed:</b> Description of test Different data Change		
70		<b>A link from this object to object 3 in '/Base/SES (current)' was created.</b>		
71			<b>1.1 Test accomplishment</b>	The changes that have been applied to the object are described in the text of the object or the preceding object. In the baseline 2.0 / current version the following objects were purged: - Object 3

Username: rcballgeon Read-only mode

**Integration Options - DOORS**

Select Attributes To Compare/Integrate:

Attributes	
<input type="checkbox"/> Editor Status	<input checked="" type="checkbox"/> Show Structural Differences
<input type="checkbox"/> ExpectedResults (Deleted in ...)	<input checked="" type="checkbox"/> Show Attribute Differences
<input checked="" type="checkbox"/> Object Heading	<input checked="" type="checkbox"/> Show Link Differences
<input checked="" type="checkbox"/> Object Short Text	<input checked="" type="checkbox"/> Show New/Deleted Objects
<input checked="" type="checkbox"/> Object Text	
<input checked="" type="checkbox"/> Requirement Type	
<input type="checkbox"/> TableBottomBorder	
<input type="checkbox"/> TableCellAlign	
<input type="checkbox"/> TableCellWidth	

(Un)Select All  Select Common

OK

# Branch Manager for DOORS

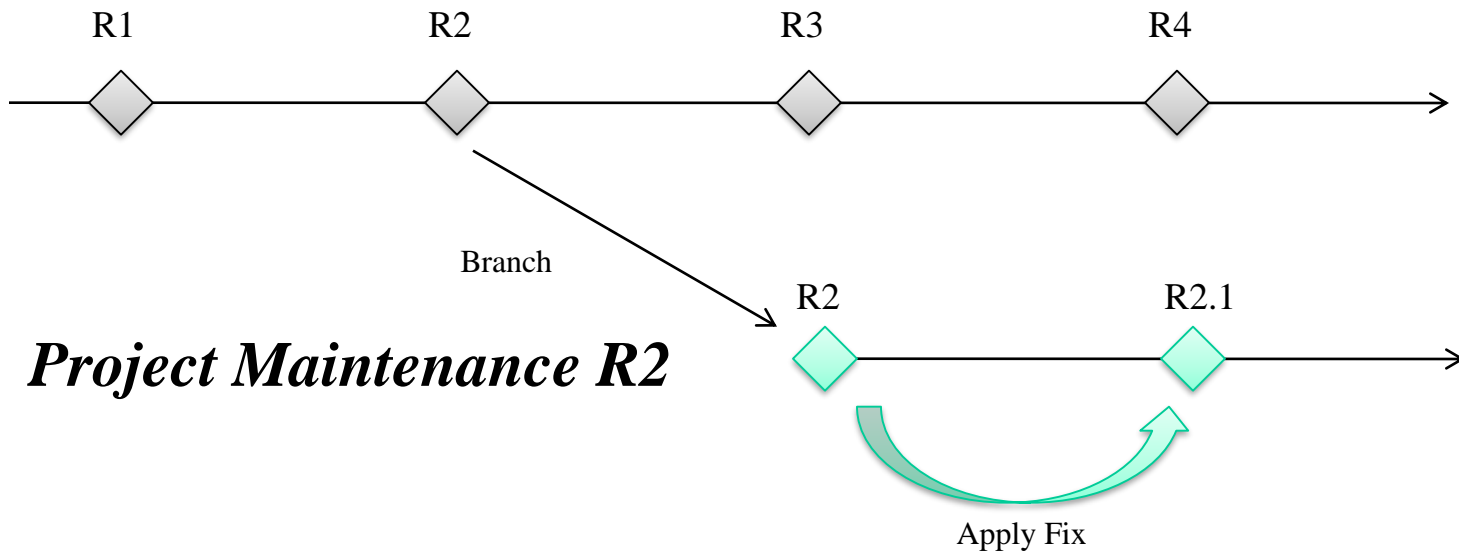


## BranchManager Usage Patterns

# Pattern - Maintenance Branch

- What
  - Branch off the main development to support released product
- Why
  - Enable a clear separation of current development and released and maintained assets

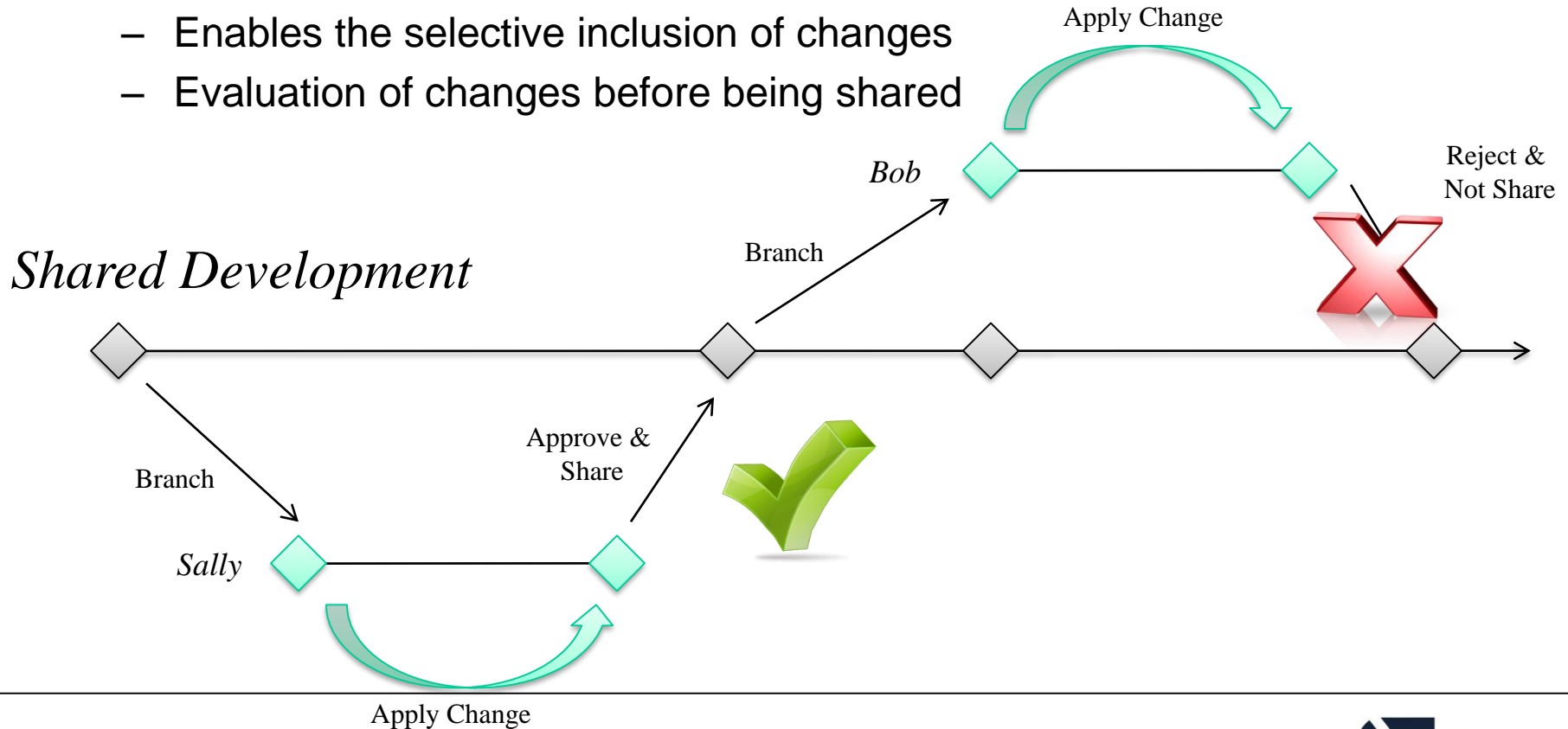
## *Project Development*





# Pattern - Personal Sandbox & Change Evaluation

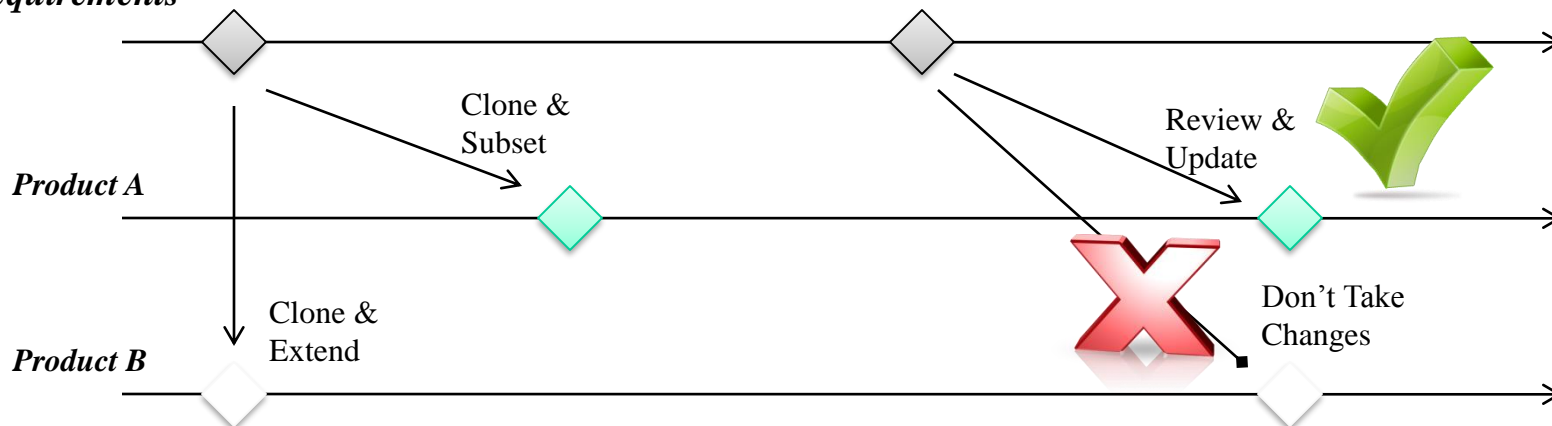
- What
  - Branch off the main development to individual development
- Why
  - Enable a clear separation of current approved content
  - Enables simultaneous development without conflict
  - Enables the selective inclusion of changes
  - Evaluation of changes before being shared



# Pattern - Shared Requirements

- What
  - Baseline set of requirements set over an entire product base. Boilerplate requirements, baseline capabilities, “platform” requirements.
- Why
  - Common sets of requirements are common across multiple products
    - Subset & extend requirements
    - Identify changes and merge updates from the common set.
    - Update the core requirements

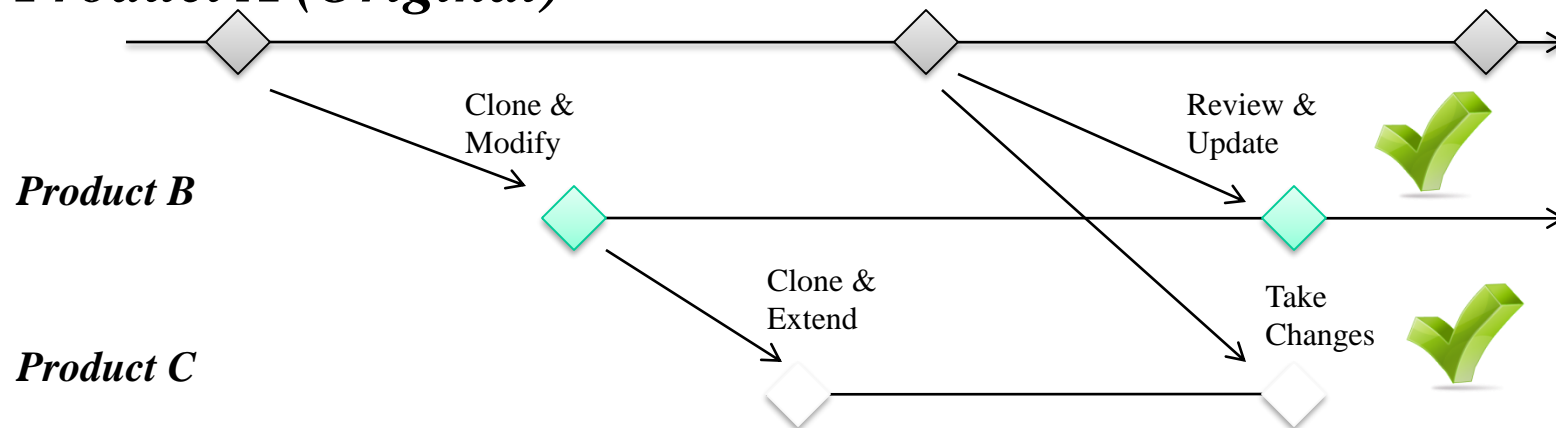
## Standard Requirements



# Pattern - Derivative Product

- What
  - Creation of a new product as a subset or extension of an existing product
- Why
  - Allows rapid creation of a new product
  - Still enables sharing across products

## *Product A (Original)*



# Branch Manager for DOORS

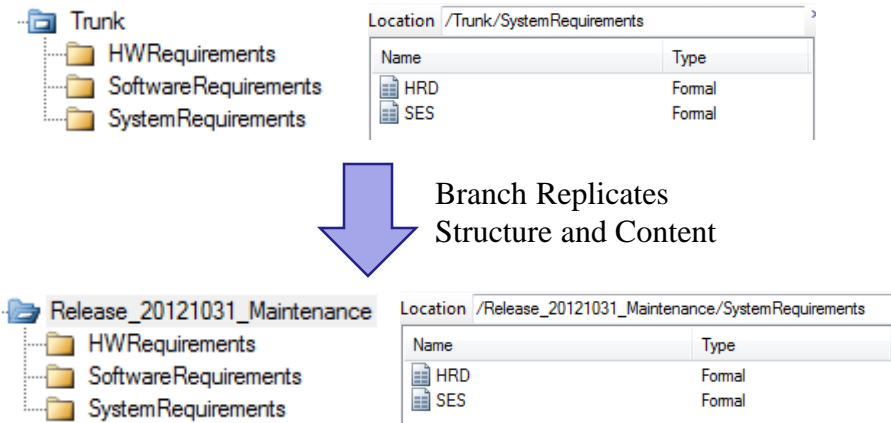


## BranchManager Solution

# BranchManager Solution

- DOORS® Projects become Branches
  - Containerizes concepts and naturally contributes
- Object Relationships captured in Metadata
  - Available in tooling to enhance functionality to the user
- Comparison Technology presented in DXL layout
  - Provides view flexibility and efficient update performance
- Three way merge solution for “pull-basis”
  - Common parent eases change assessment and merge choices
- Quick merge
  - Enables update to multiple streams at once

# BranchManager - Branching



Branch History - DOORS

Selected Modules

Name	Branch + Folder	Last Modified
HWRS	/Release_20121031_Maintenance/HWRequirements	2012-11-13, 05:08:49
HRD	/Release_20121031_Maintenance/SystemRequirements	2012-11-13, 05:08:57
SES	/Release_20121031_Maintenance/SystemRequirements	2012-11-13, 05:08:54
SWRS	/Release_20121031_Maintenance/SoftwareRequirements	2012-11-13, 05:08:56

Module History

Date	Action	Details
2012-11-08	Baseline	Of: /Base/SES (1.0)
2012-11-08	Branch	From: /Base/SES (1.0), To: /IntegrationTest_BranchA/SES (0.0)
2012-11-08, 21:49:06	Baseline	Of: /IntegrationTest_BranchA/SES (1.0)
2012-11-08, 21:50:27	Branch	From: /IntegrationTest_BranchA/SES (1.0), To: /IntegrationTest_BranchAD/SES (0.0)
2012-11-12, 17:52:39	Branch	From: /IntegrationTest_BranchAD/SES (0.0), To: /Trunk/SES (0.0)
2012-11-13, 05:08:54	Branch	From: /Trunk/SystemRequirements/SES (0.0), To: <selected module> (0.0)

Export upper plane to Excel Show integration with Source Branch Close

## Creating a Branch

Please select the Modules to be branched - DOORS

Module Name	Baseline	Module Path	ID
<input checked="" type="checkbox"/> HWRS	0.0	/Release_2012...	00000280
<input checked="" type="checkbox"/> HRD	0.0	/Release_2012...	000002a0
<input checked="" type="checkbox"/> SES	0.0	/Release_2012...	000002a1
<input checked="" type="checkbox"/> SWRS	0.0	/Release_2012...	000002c0

Select All Unselect All Invert Selection Remove Selected Search

Insert all from Folder Show Complete Database Tag Lists Baselines Load Most Recent Baselines Load Baseline Set Use selected Modules

Branch Copy - DOORS

This script will copy the selected modules from the source project branch, to the target project branch, trying to recreate the links to already existing objects. Only those modules will be copied, that do not already exist in the target branch.

Selected source modules to be branched:

Select Modules

Module Name (Baseline)

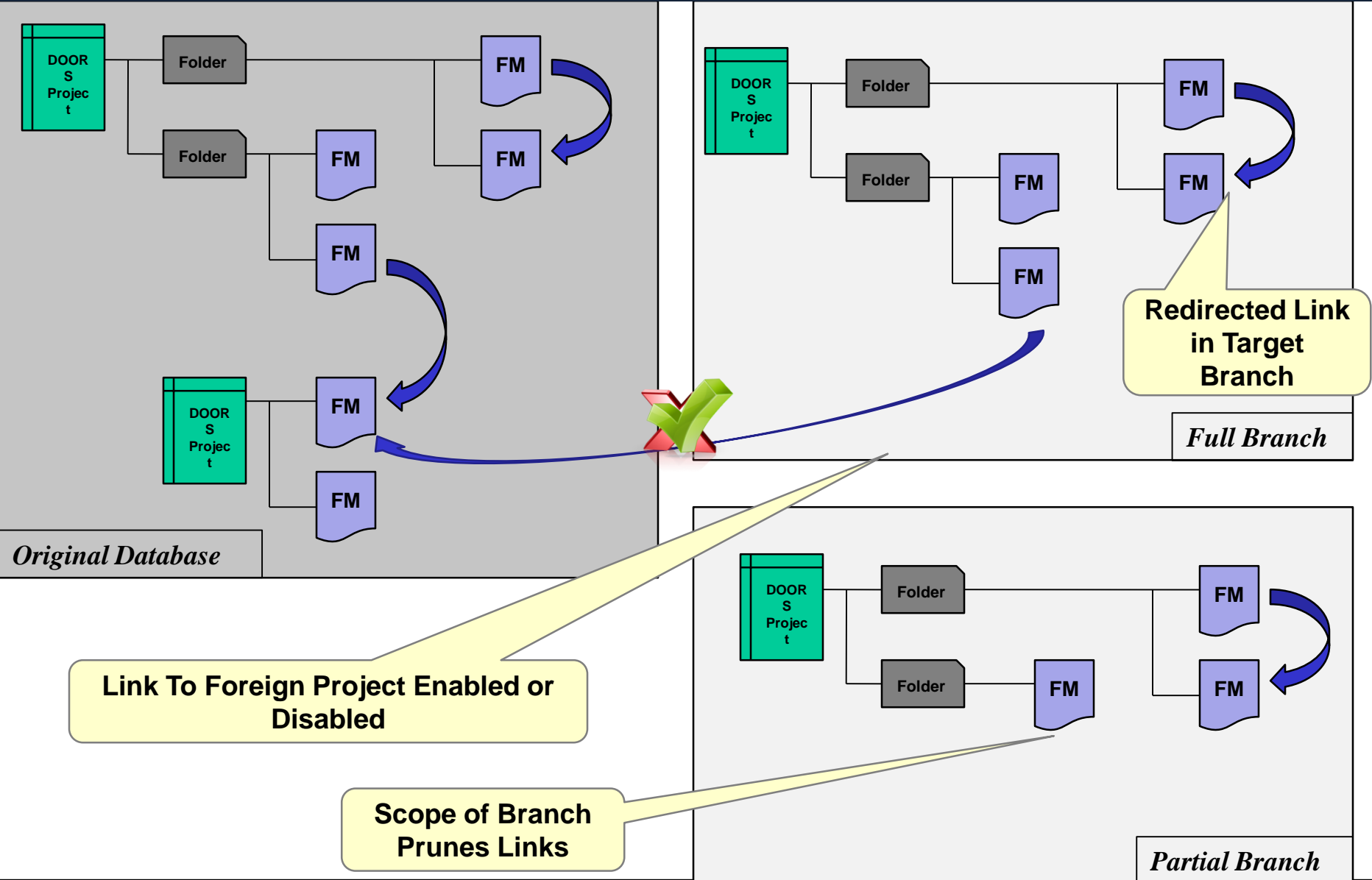
HWRS (0.0)  
HRD (0.0)  
SES (0.0)  
SWRS (0.0)

Select target project: Browse

Recreate links to foreign projects  
 Redirect links to objects that are missing in the target branch to objects in the source branch  
 Do not allow new links outside the branch

Start Branch Copy Close

# BranchManager - Branching Link Management



# BranchManager - Comparison

**Compare Modules - DOORS**

Method:  Compare by Link  Compare by Attribute  Compare with Baseline  Compare with Branch

Target:

Target is:  older (before change)  newer (after change)

Note: A directed comparison is performed, that will yield a difference (before change -> after change)

Match By Common Attribute Options  
Please choose attributes that have unique, identical values in the source and target module:

Source Attribute:  Target Attribute:

Comparison Settings  
Select Attributes To Compare:

Attribute	
<input type="checkbox"/> Absolute Number	<input checked="" type="checkbox"/> Show Structural Differences
<input type="checkbox"/> Editor Comment	<input checked="" type="checkbox"/> Show Attribute Differences
<input type="checkbox"/> Editor Name	<input checked="" type="checkbox"/> Show Link Differences
<input type="checkbox"/> Editor Status	<input checked="" type="checkbox"/> Show New / Deleted Objects
<input type="checkbox"/> ExpectedResults (Deleted i...	<input checked="" type="checkbox"/> Show Deletions / Purged Objects in Predecessor
<input checked="" type="checkbox"/> Object Heading	<input checked="" type="checkbox"/> Show Table Differences in Predecessor

(Un-)Select All  Select Common

## Detected Changes

- Modification/Deletion/Addition
- Textual Attributes
- OLE Attributes
- Images
- DOORS Tables
- Link Changes
- Object Movement

Comparison with HRD current	ID	This is the autogenerated Test Data for Integration Modules (see 'makeTestData_Integration.dxl')
'Object Text' was changed: <i>This module is autogenerated by the makeTestData_Compare.dxl script. Start the script with the "-Compare Test-Data -Base" as Change at current textual module data</i>	1	<b>1 Description of test data</b>
object 2 in '/Project A/HRD Folder/HRD (current)' was moved to section 1.1.0-1. object 2 in '/Project A/HRD Folder/HRD (current)' was deleted. object 71 in '/Project A/HRD Folder/HRD (current)' was deleted.	72	Change to textual data
object 2 in '/Project A/HRD Folder/HRD (current)' was moved to section 1.1.0-1. object 2 in '/Project A/HRD Folder/HRD (current)' was deleted. object 71 in '/Project A/HRD Folder/HRD (current)' was deleted.	70	<b>1.1 Test accomplishment</b>
object was moved to section 1.1. 'Object Text' was changed: OLE Object 0 has changed. OLE Object 0 was resized. Old Size: (161/52) New Size: (167/53) Content before change: This is <span style="background-color: #90EE90;">an</span> <span style="background-color: #FF0000;">embedded</span> OLE Excel TEST	30	This is <span style="background-color: #90EE90;">an</span> <span style="background-color: #FF0000;">embedded</span> OLE Excel TEST

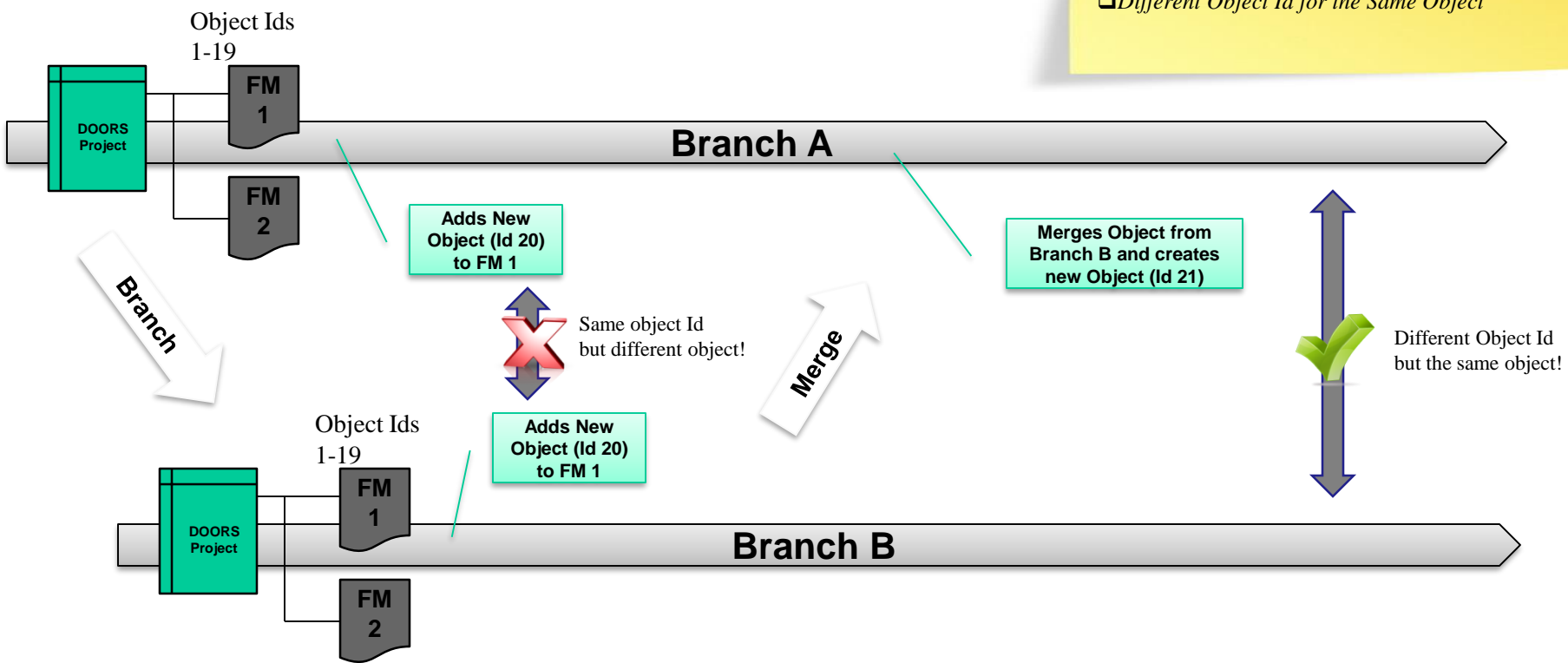
Comparison with HRD (2.0 (INT2012-05-03))	Comparison with HRD current	ID	This is the autogenerated Test Data for Integration Modules (see 'makeTestData_Integration.dxl')
'Object Text' was changed: <i>This module is autogenerated by the makeTestData_Compare.dxl script. Start the script with the "-Compare Test-Data -Base" as Change at current textual module data</i>	'Object Text' was changed: <i>Another Change to textual data</i>	1	<b>1 Description of test data</b>
object 2 in '/Base/HRD (2.0 (INT2012-05-03))' was moved to section 1.1.0. object 2 in '/Base/HRD (2.0 (INT2012-05-03))' was deleted. object 71 in '/Base/HRD (2.0 (INT2012-05-03))' was deleted.	object 2 in '/Project A/HRD Folder/HRD (current)' was moved to section 1.1.0. object 2 in '/Project A/HRD Folder/HRD (current)' was deleted. object 71 in '/Project A/HRD Folder/HRD (current)' was deleted.	72	Change to textual data
object 2 in '/Base/HRD (2.0 (INT2012-05-03))' was moved to section 1.1.0. object 2 in '/Base/HRD (2.0 (INT2012-05-03))' was deleted. object 71 in '/Base/HRD (2.0 (INT2012-05-03))' was deleted.	object 2 in '/Project A/HRD Folder/HRD (current)' was moved to section 1.1.0. object 2 in '/Project A/HRD Folder/HRD (current)' was deleted. object 71 in '/Project A/HRD Folder/HRD (current)' was deleted.	70	<b>1.1 Test accomplishment</b>
object was moved to section 1.1. 'Object Text' was changed: OLE Object 0 has changed. OLE Object 0 was resized. Old Size: (161/52) New Size: (167/53) Content before change: This is <span style="background-color: #90EE90;">an</span> <span style="background-color: #FF0000;">embedded</span> OLE Excel TEST	object was moved to section 1.1. 'Object Text' was changed: OLE Object 0 has changed. OLE Object 0 was resized. Old Size: (161/52) New Size: (167/53) Content before change: This is <span style="background-color: #90EE90;">an</span> <span style="background-color: #FF0000;">embedded</span> OLE Excel TEST	30	This is <span style="background-color: #90EE90;">an</span> <span style="background-color: #FF0000;">embedded</span> OLE Excel TEST



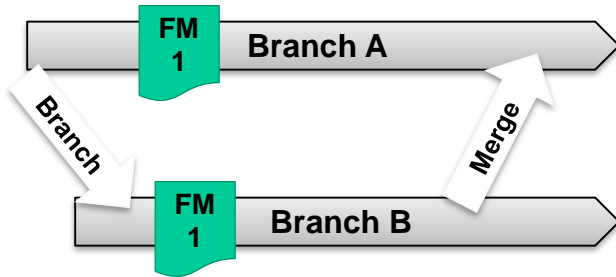
# BranchManager – Comparison / Object Identification

**Why Object Ids alone don't work**

- ❑ Not globally unique
- ❑ No knowledge on branches
- ❑ Same Object Id for different objects
- ❑ Different Object Id for the Same Object

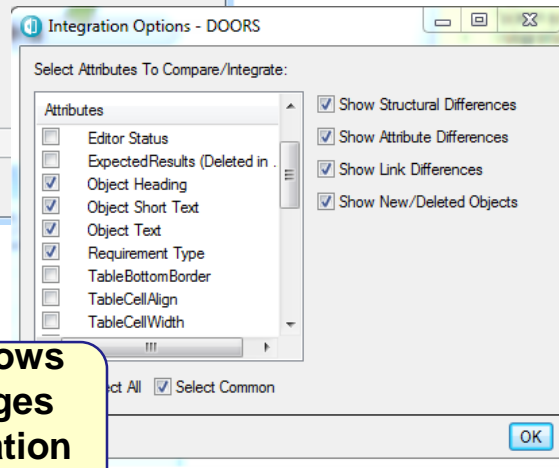
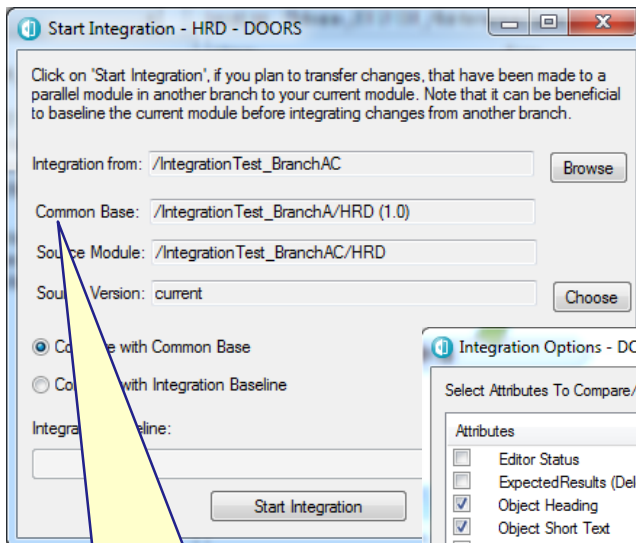


# BranchManager - Merge Integration

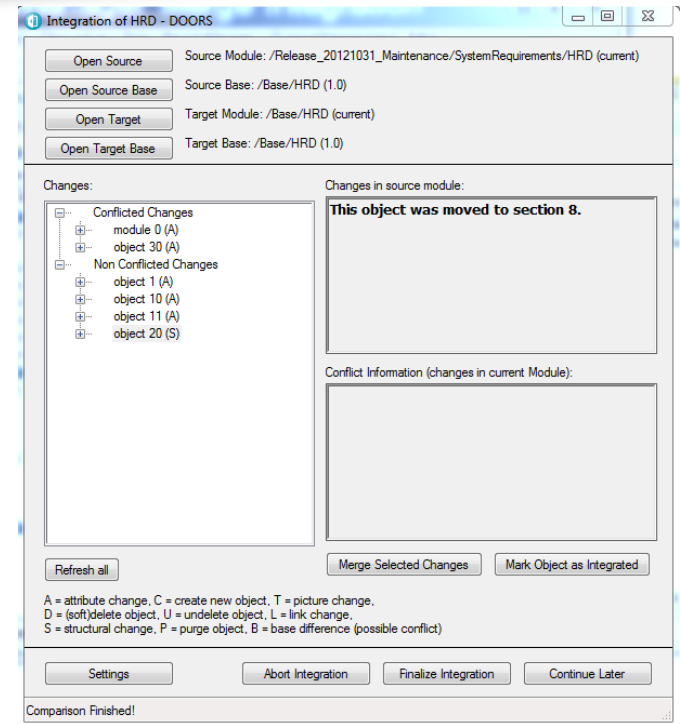


## BranchManager Integration

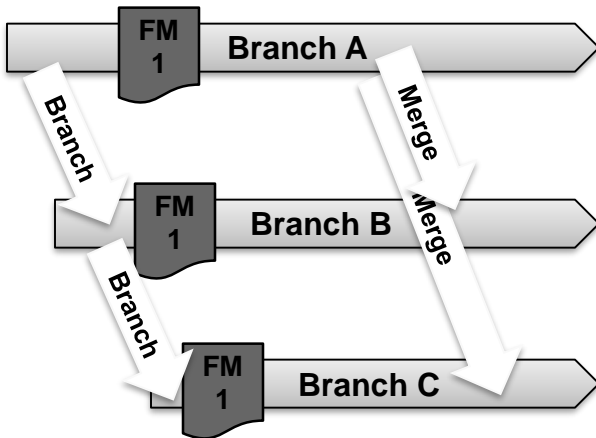
- Three-way merge using common parent
- "Pull-Based" One-to-One Merge Solution
- Automatic Conflict Detection
- Applies in any direction for modules with a "common parent"
- Integration Baseline supports merging only changes since last integration event
- Forces Baselines for consistent references



**Integration base allows evaluation of changes from the last integration event.**

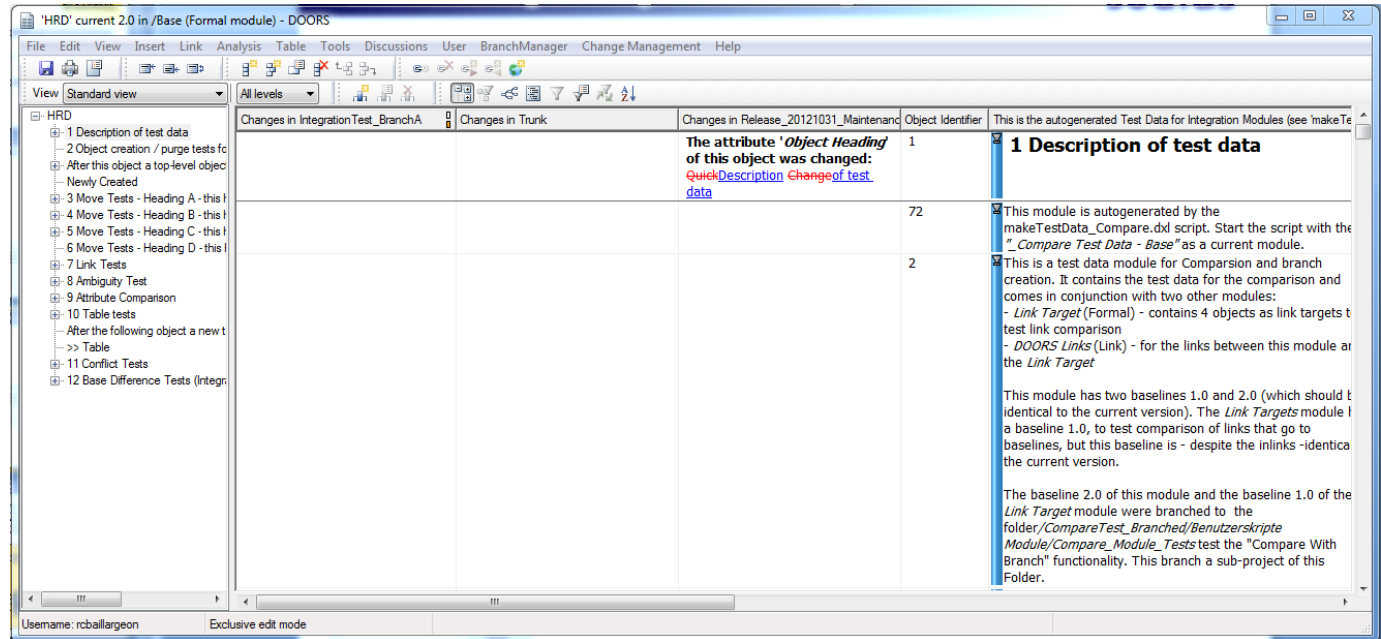
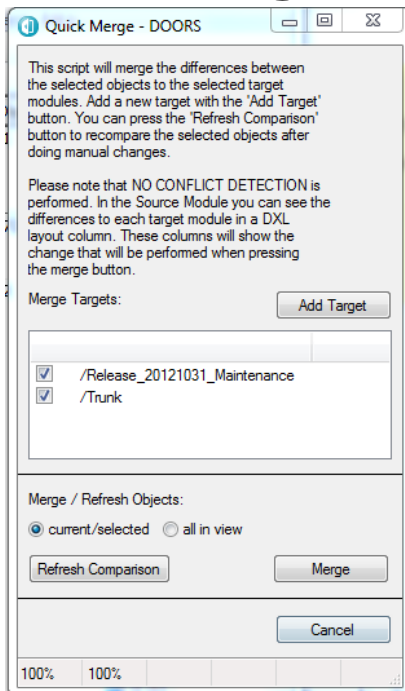


# BranchManager - Merge / QuickMerge



## BranchManager QuickMerge

- “Push-Based” One-to-Many Merge Solution
- No Conflict Detection
- Applies for modules with a “common parent”
- Interactive Merge Solution
- Dynamic Evaluation



# Conclusion

- BranchManager Provides Core Needed Capabilities
  - Reuse for reduced investment and higher quality
  - Gatekeeping for quality controls and reviews
  - Cloning for rapid new derivative products, yet still linked
- Flexible Adoption
  - Applicable to many user scenarios
  - Strong foundation resolving major challenges of configuration management in DOORS
  - Configurable to an organization's specific practices
- Contacts
  - IT-Qbase for Licences and Support (<http://it-qbase.eu>)
  - COMPLIANCE Technologies for Demonstrations, Training and Consultancy ([www.compliance-technologies.com](http://www.compliance-technologies.com))