

Baselining Requirements Assets with Rational RequisitePro and Rational ClearCase

A Rational Software White Paper

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Introduction

With the release of Rational RequisitePro 2001, users can now baseline their requirement assets with the rest of their development lifecycle artifacts using Rational Unified Change Management (UCM). This provides the user with several key benefits:

- Ability to include requirement assets as part of a UCM project baseline
- Ability to create new Rational RequisitePro projects from existing UCM project baselines
- Ability to restore a project from an existing UCM project baseline

This is the first big step in the process of versioning requirements. However, it is not yet possible to compare what requirements have changed between baselines, merge requirement changes between baselines or version (check-in/out) individual requirements within a versioned Rational RequisitePro project.

Overview

For Rational RequisitePro 2001, versioning will occur at the project level (project baseline). If the project is versioned, then everything in the project is versioned together. For the RequisitePro 2001 release, versioning operations are not being directly exposed to the end user. Rather, RequisitePro users will use RequisitePro as they always have. Only the RequisitePro administrator will do versioning operations. The administrative versioning operations are covered in detail in later sections of this document.

Rational RequisitePro end users need not necessarily even know that they are working on a versioned project. Rather, they will still access the RequisitePro project .RQS file from a shared directory, access documents in a shared directory and work out of the configured relational database. The only difference is that the shared directory will be a ClearCase view. All of the versioning work occurs only during two admin-initiated operations; those being project creation and check-in-all. Both of these operations are performed from the Rational Administrator application. (Note: the Rational Administrator is installed with Rational Suite install or RequisitePro).

How does a user go about versioning a Rational RequisitePro project and making a baseline? The next sections will describe the purpose and major user steps required to perform the key baseline functions, including;

1. Creating a new versioned Rational RequisitePro project
2. Placing an existing RequisitePro project under version control
3. Performing the Check-in-all operation
4. Making a UCM baseline
5. Creating a new RequisitePro project from a UCM baseline

Creating a new versioned Rational RequisitePro project

Placing a Rational RequisitePro project under version control is performed through the Rational Administrator. The Rational Administrator provides customers a central place to manage Rational Projects. A Rational Project (RA Project) may reference a ClearQuest database, a RequisitePro project, a Rational TestManager database, and one or more Rational Rose models. When versioning components of a Rational Project, the Rational Project must be associated with a Rational ClearCase UCM Project.

A single Rational ClearCase UCM integration view must exist that can be used as the workspace for all users working on a versioned Rational RequisitePro project. Integration views are ClearCase views that are associated with an Integration Stream for a given UCM project. All RequisitePro users and administrators must work in this same (shared) integration view.

Creating a new Rational RequisitePro project and adding it to version control is a 3-step process. First setup a Rational ClearCase UCM project and view; Second create a new Rational Project that is UCM enabled and associated with the ClearCase UCM project; Third create a new RequisitePro project that will be added to version control. Following are more specific instructions on the three-step process.

Step 1: Rational ClearCase UCM Project Setup

Perform the following UCM setup steps to create the Rational ClearCase UCM Project and integration view that will be associated to the Rational Project:

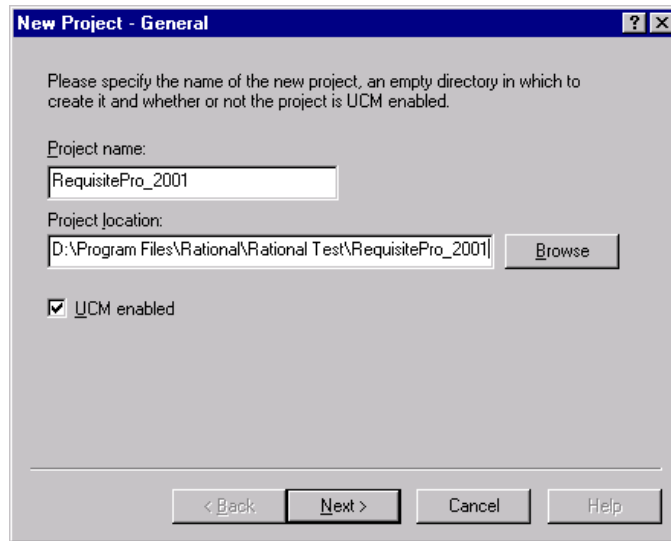
1. Create a Rational ClearCase UCM component (VOB) that will be used to store your requirement assets
2. Create a UCM project to be associated with your Rational Administrator project, this UCM project must contain the component created in the previous step and the component must be modifiable.
3. Create an integration view for the UCM project. The integration view may be a snapshot or dynamic view, but it must be located where all Rational RequisitePro users can access it. This view will store the RQS file to which the users will connect and all other requirements assets.

Note: Please refer to the Rational ClearCase UCM documentation for more information on UCM components, project and views.

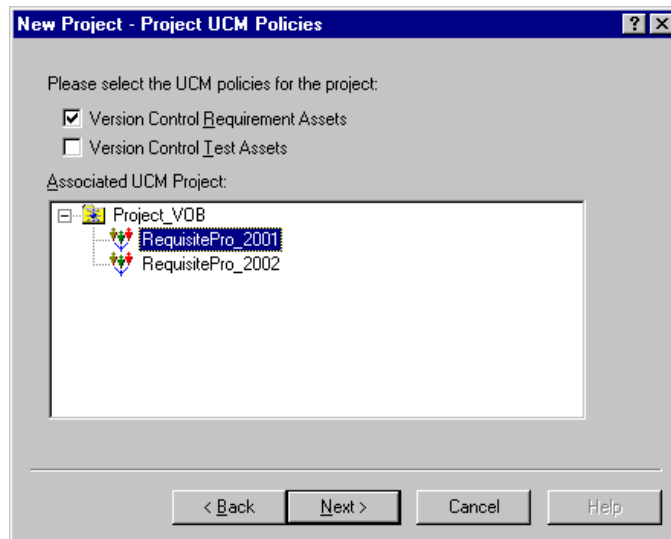
Step 2: Rational Project Setup

After a Rational ClearCase UCM Project and integration view have been created, perform the following steps to create a new Rational Administrator Project and associate it with the ClearCase UCM project:

1. Launch the Rational Administrator
2. Select the “New Project” command from the File menu or toolbar. The first page of the New Project wizard appears. Enter the Rational Administrator project name, location and indicate if the project is to be UCM enabled. (Note: the location of this file does not have to be in the UCM view. This is purely a configuration file that is not versioned).



3. Select the Next button. If the “UCM enabled” option is selected, the “Policies” wizard page appears. Select to Version Control Requirement Assets and select the UCM project to associate with the RA project.



4. Select the Next button. The security page appears: optionally enter a password and select the Next button. This security is used only for access to configuration information for the Rational Project and not for security on the Rational RequisitePro project.
5. The summary page appears: select to Configure the Project Immediately after it is created
6. Select the Finish button.

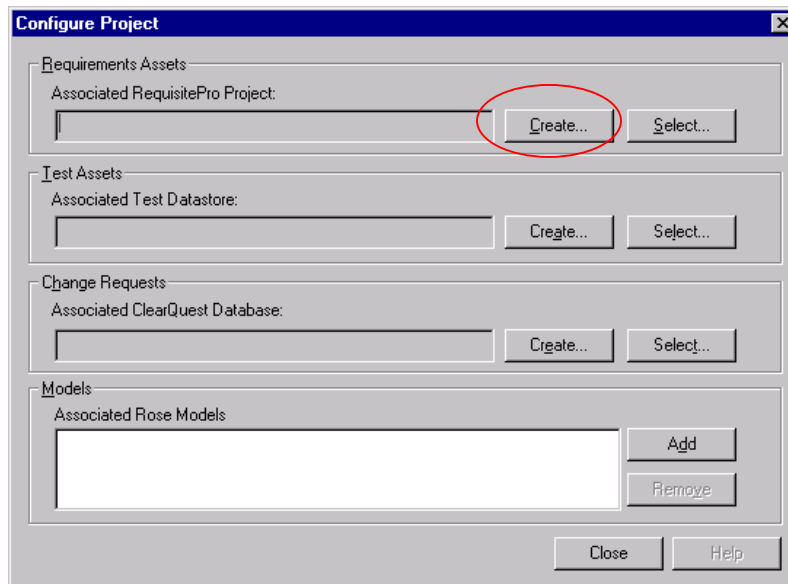
Once the Finish button is selected and all information is validated, the Rational Project is created and the association between the Rational Project and UCM Project is established. A file is created in the specified location (in step 1) identifying the project. The file will have the name of the project plus a “.rsp” extension. The “.rsp” file is not versioned.

Step 3: Create a new Rational RequisitePro project

The configuration dialog, where you can create a new Rational RequisitePro project, will now appear.

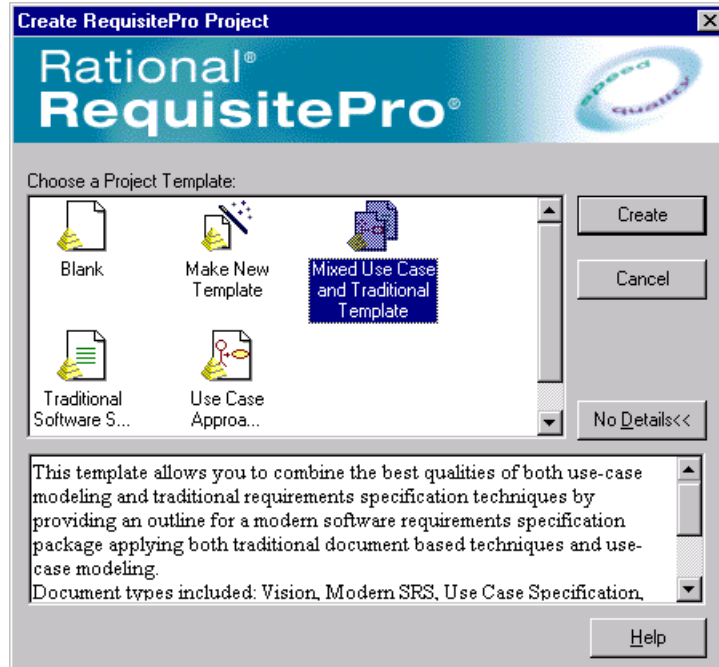
Perform the following steps to create a new versioned Rational RequisitePro project:

1. From the Rational Project configuration dialog, choose the create button under the Requirement Assets section

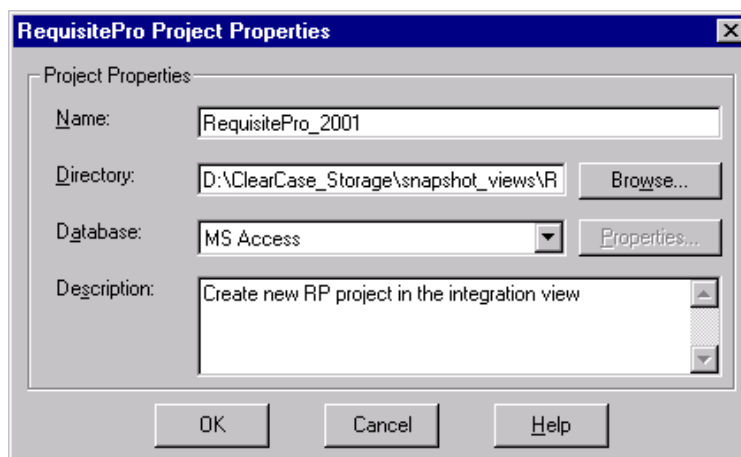


2. The "Create RequisitePro Project" dialog is displayed

3. Select a Rational RequisitePro Project template from which to create your new RequisitePro project



4. The Rational RequisitePro Project Properties dialog is presented. Enter the database name, location, description, and database type. Note: the location for the RequisitePro project must be the shared UCM integration view created in Rational ClearCase setup step. The system will verify that the database location specified is within an integration view associated to the integration stream of the UCM project, if not, you will receive an error and not be allowed to continue.



5. Following are the steps the Rational RequisitePro application performs to create the new RequisitePro project and add it to version control:

- a. RequisitePro creates a RequisitePro database file (.rqs) in the location specified (integration view).
 - b. RequisitePro copies the project structure XML file (based upon template) to the location specified. Note: RequisitePro persists the requirements information in Rational ClearCase via files in XML format. This is an internal implementation detail and will not affect how the end user uses RequisitePro.
 - c. RequisitePro creates a new activity in ClearCase for adding the .rqs and XML file to version control.
 - d. RequisitePro places the .rqs and XML files under version control and checks in the files.
 - e. RequisitePro uploads the project structure from the XML file to the database.
 - f. RequisitePro adds a reference to the Rational Project in the database.
 - g. RequisitePro returns the path and file name of the .rqs file to the Rational Administrator.
6. The RequisitePro project is created and associated with the Rational Project and is under version control

Note: You may want to set the new project's properties to not save documents in the Rational RequisitePro format. If documents are saved as Word documents, you will have better flexibility in working with Rational ClearCase. This means you could use ClearCase's diff tool to compare word documents if you save the documents with a .doc extension instead of the extension(s) that RequisitePro would create (.ucs, .vis, etc.). However, if you do choose to not save in RequisitePro format it is more likely that someone may try to open and modify a RequisitePro document directly from Word (which would not be a good idea).

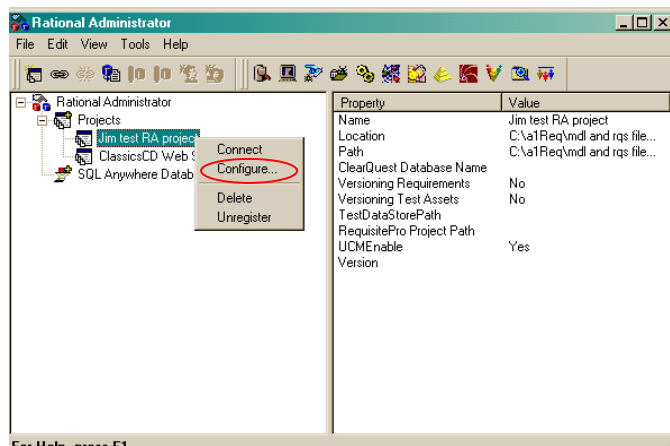
Alternate Step 3: Add an existing Rational RequisitePro project to version control

As an alternative to creating a new Rational RequisitePro project, you can add an existing RequisitePro project to version control. This process is as described in Step 3 above, however, choose “select” instead of “create” in the configure project dialog and pick the existing RequisitePro project (.RQS) file from it's current location. Note: the .RQS file must not already be under version control or this will fail.

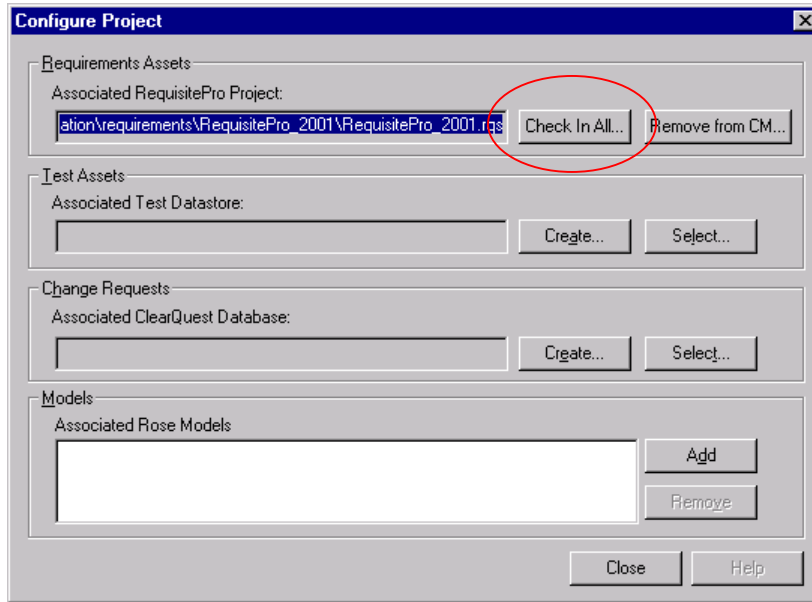
Performing the Check-in-all operation

Once a Rational RequisitePro project has been placed under version control, you can execute a “Check-in-all” command from the Rational Project’s configuration dialog. This operation will create a new version of all the requirement assets in the RequisitePro project. This process involves writing the contents of the RequisitePro database to XML. For those XML files that may already exist, a new Rational ClearCase version will be created. If new requirement types or documents have been added to the project since the last check-in-all, then a new ClearCase element will be created and added to version control. The check-in-all operation is how you version your RequisitePro project (including the information in the database and Word documents). This is a necessary step prior to making a UCM baseline of those requirement assets from ClearCase.

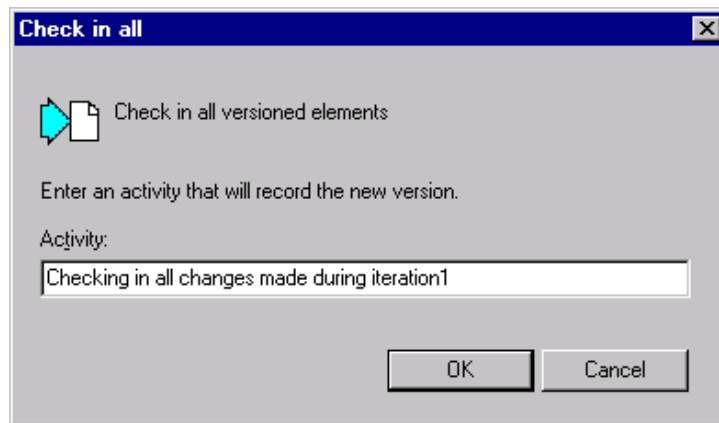
1. Select to configure your Rational Project from the Rational Administrator



2. Select the Requirements Assets "Check-In All" button in Configure Project dialog



3. Rational RequisitePro places an exclusive lock on the RequisitePro project
4. If the project can be locked exclusively, then RequisitePro displays a confirmation Yes-No message box with the text "The operation will check-in-all requirement assets in their current state. By performing this operation you may create a baseline of these requirement assets using Rational ClearCase. Do you want to continue?"
5. Select "Yes" in the confirmation dialog
6. RequisitePro displays a "Check-in-all" dialog, which prompts the user for an activity "headline" text to describe the requirements assets being checked in
7. Enter a headline and select OK on the "Check-in-all" dialog



8. Following are the steps the RequisitePro application performs during check-in-all:
 - a. RequisitePro adds any new files to version control .
 - b. RequisitePro checks out any known files that are currently checked in.
 - c. RequisitePro updates all (XML) files from database.

- d. RequisitePro deletes/removes any obsolete files from version control.
 - e. RequisitePro checks in all files using the associated UCM activity with the user-specified headline.
 - f. RequisitePro checks out all files to the view, using a well-known activity that is unique to the RequisitePro project. This check out occurs because all requirements assets must be writeable for RequisitePro to work correctly.
9. The check-in-all completes and the RequisitePro project has been versioned

Troubleshooting Tips:

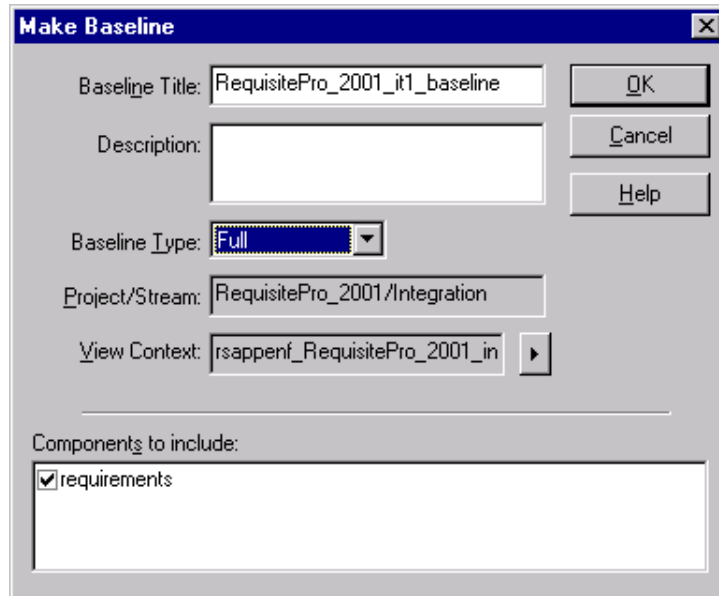
If any problems occur during the check-in-all operation, the check-in-all dialog will inform the user and display the details of the errors. Many times these errors are related to Rational ClearCase errors during check in or check out of the project files. If you receive any errors, try the following:

- Re-run the check-in-all operation. (this will usually fix the problem)
- Identify what file the error occurred on and confirm that it is in the view and in a checked-out state. Then re-run the check-in-all operation until it completes successfully.

Making a UCM Baseline

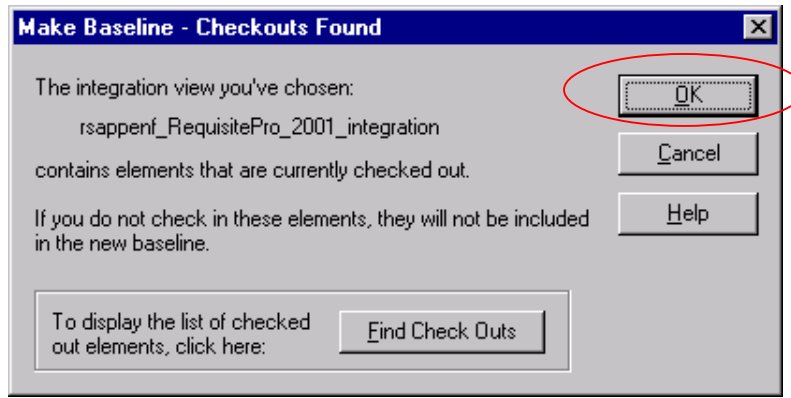
After completing the check-in-all operation, you may decide to create a UCM baseline of your requirement assets. A baseline is a Rational ClearCase UCM object that typically represents a stable configuration for one or more components. A baseline identifies activities and one version of every element visible in one or more components.

1. From the Rational ClearCase Project Explorer, select the UCM project
2. Expand the UCM Project
3. Select the Integration Stream that is being used by all Rational RequisitePro users for this project
4. Right-Click and select “Make Baseline”
5. Enter a baseline title



6. Select “Full” for baseline type
7. Click “OK” to make the baseline

8. You will be presented with a dialog saying that checkouts were found, this is expected behavior, just click OK to continue (all files in the view are left in a checked out state in order to support editing of the Word documents and requirements by RequisitePro)



9. Close the Make Baseline dialog

Creating a new Rational RequisitePro project from a UCM baseline

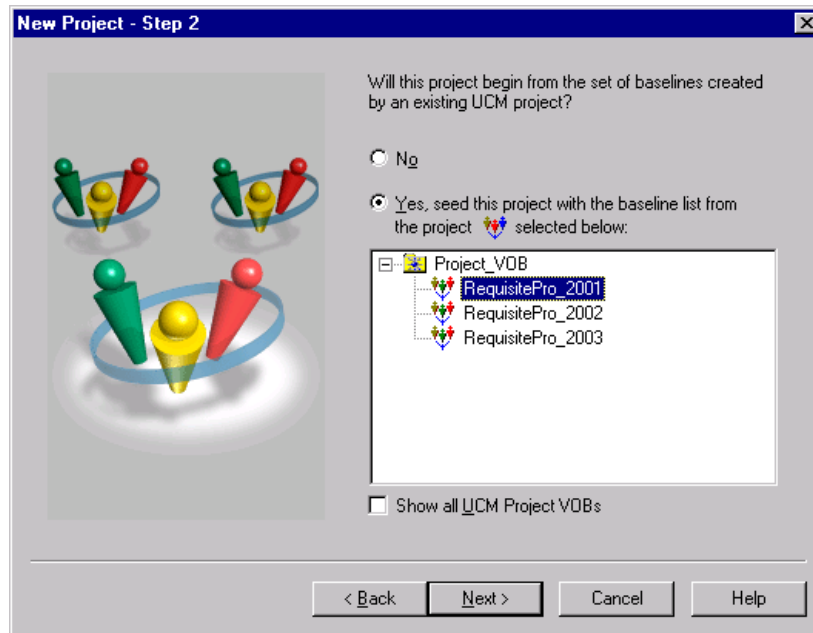
One of the key benefits of the new baseline capabilities of Rational RequisitePro is the ability to create a new RequisitePro project from an existing UCM baseline. Creating a new RequisitePro project from a UCM Baseline is very similar to the steps described above to create a versioned RequisitePro project. However, there are a few key differences. When creating a new UCM Project, make sure to include the existing requirements component at the baseline from which you want to create your new RequisitePro project. Furthermore, you will want to “Select” the existing RequisitePro project file (.RQS) file in the view of your UCM project as opposed to creating a new RequisitePro project.

Important Note: If the original Rational RequisitePro project had links to Rational Rose, Rational ClearQuest or to other RequisitePro projects those links will not be restored when creating and new project from a baseline. Functionality to save and restore such links is planned for a future release. Please also note that the history of individual requirements and documents is not restored when creating a new RequisitePro project from a baseline.

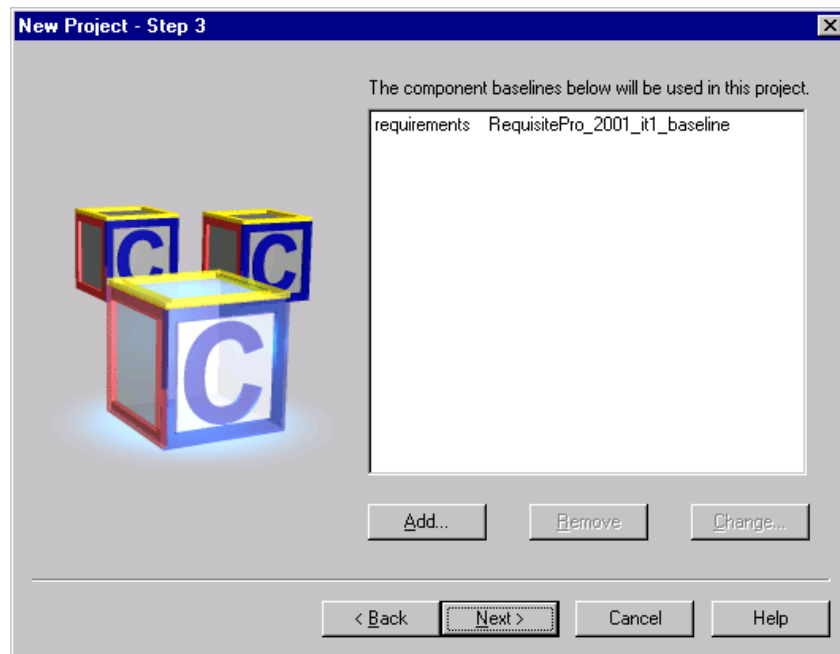
Following are the steps to create a new Rational RequisitePro project from a UCM baseline:

Step 1: Create a UCM Project containing your baseline

1. Create a new UCM project using the Rational ClearCase Project Explorer
2. Select to seed the project with a baseline from an existing UCM project



3. Confirm that the proper component and baseline are selected



4. Complete the creation of a UCM Project
5. Create a new UCM integration view which will be shared by all Rational RequisitePro users accessing the new UCM project

Step 2: Create a new Rational Project

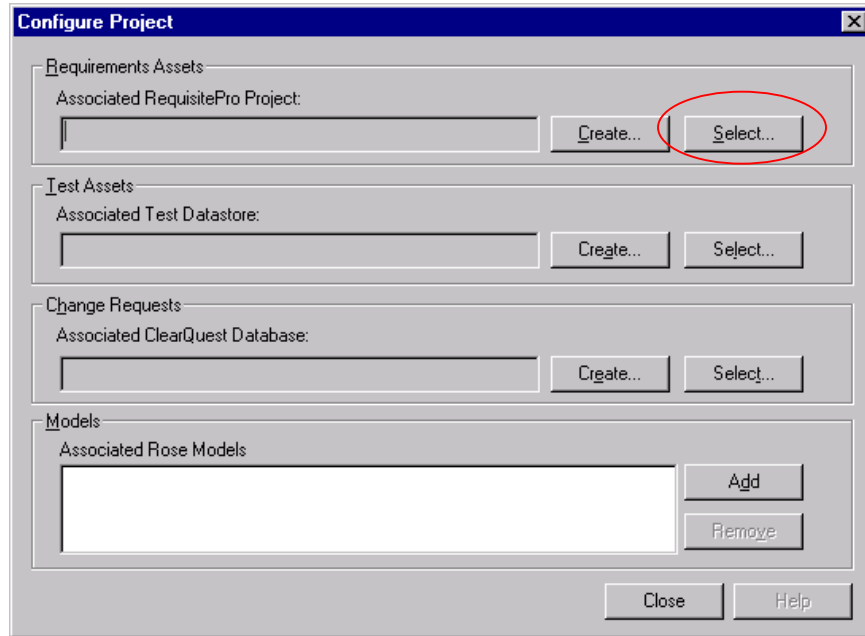
After a Rational ClearCase UCM Project and integration view have been created, perform the following steps to create a new Rational Project and associate it with the ClearCase UCM project and view:

1. Launch the Rational Administrator
2. Select the "New Project" command from the File menu or toolbar. The first page of the New Project wizard appears. Enter the Rational Administrator project name, location and indicate if the project is to be UCM enabled.
3. Select the Next button. If the "UCM enabled" option is selected, the "Policies" wizard page appears. Select the check box to Version Requirement Assets and select the UCM project to associate to the Rational Administrator project.
4. Select the Next button. The security page appears: optionally enter a password and select Next button.
5. The summary page appears: select to configure the project immediately after it is created
6. Select the Finish button.

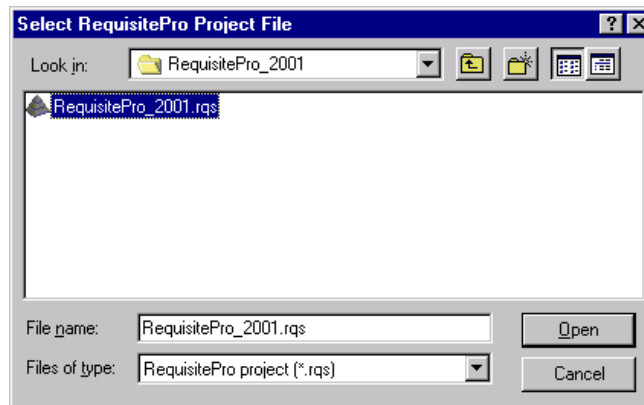
Once the Finish button is selected and all information is validated, the Rational Project is created and the association between the Rational Project and UCM Project is established. A file is created in the specified location (in step 1) identifying the project. The file will have the name of the project plus a ".rsp" extension. The ".rsp" file is not versioned.

Step 3: Select the RQS file from your integration view

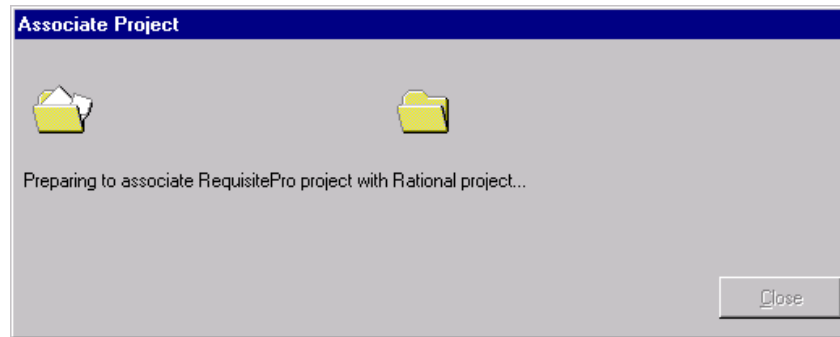
1. The Rational Project configuration dialog should automatically appear, choose the “Select” button under the Requirement Assets section



2. Browse to your new shared integration view and select the Rational RequisitePro project (.RQS) file. The system will determine that the project location specified is within an integration view associated to the integration stream of the UCM project, if not, you will receive an error and not be allowed to continue



3. RequisitePro will associate the RequisitePro project with the Rational project



4. Change the name of this new project through the RequisitePro Project Properties dialog. As this project, by default, will have the same name as the original. The new project is now ready to use.

Miscellaneous

Creating a document in baselined project

Any documents created in a versioned Rational RequisitePro project **must** be located in the shared integration view of the UCM project associated with the RequisitePro Project.

1. From the Rational RequisitePro document menu select to create a new RequisitePro document
2. RequisitePro displays the New Document dialog
3. Enter a name, description, filename, and document type, but leaves the location set to its default, which is the project directory
4. RequisitePro determines that the project is under version control
5. RequisitePro determines that the location is in a view of the same UCM project associated with the Rational Administrator project
6. RequisitePro creates the new document, but does not add it to version control. The new document will be a view-private file until the "Check-in-all" operation is performed from the Rational Administrator

Moving a document in a baselined project

All documents in a versioned Rational RequisitePro project **must** be located in the shared integration view of the UCM project associated with the RequisitePro Project. Therefore, the only place you can move a document to is a different sub-directory in the existing shared integration view.

1. Select to view the properties for a Rational RequisitePro document
2. RequisitePro displays the Document Properties dialog.
3. Select a different location and then select to continue
4. RequisitePro determines that the project is under version control
5. RequisitePro determines that the location is in a valid view
6. RequisitePro copies the document to the new location and then deletes the original

Special Considerations

- Performing a Rational ClearCase check-in operation on a Rational RequisitePro document

If there is no security on the Rational ClearCase elements in the shared integration view, nothing will prevent a user from performing a check-in on a document. If this occurs, then the Rational RequisitePro system will treat this document as read-only and no user will be able to modify it until the document is checked out from ClearCase. This will not effect access to individual requirements if users work in the RequisitePro database (via the "views" interface to RequisitePro) and not in the checked-in Word documents. It is not recommended that check-in or check-out operations be performed directly on requirements elements in ClearCase.

- Rational RequisitePro Project Backup and Restore Procedures

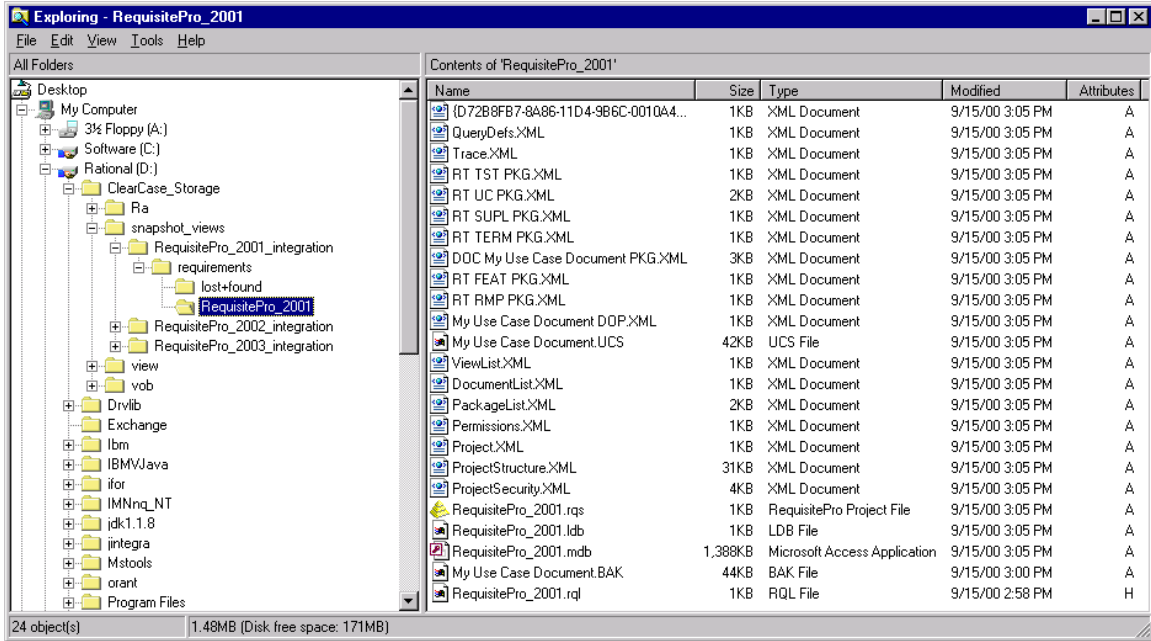
It may be desirable for a Rational RequisitePro administrator to understand the backup and restore procedures for RequisitePro projects that are utilizing the UCM baseline feature. The administrator should follow the documented Rational ClearCase procedures for backup and restore of UCM components and views.

- UCM Compare Baseline Operation

A user may use the standard UCM Compare Baseline utility to compare changes between baselines. However, this will not provide much value for the requirements user, as it will only show the UCM activity associated with the UCM baseline operation and will not show the individual requirement changes between baselines.

What You See In The Rational ClearCase View

Once a Rational RequisitePro project has been created and versioned, you can expect to see something like the following in your Rational ClearCase view.



As you can see, the Rational RequisitePro project files, including the RQS file, XML files and the Word documents will be in a directory with the name you gave your RequisitePro project (RequisitePro_2001, in the example above). This folder is by default off of the root level of the VOB (the VOB is named “requirements” in the example above).

Also of note in the example above, is that there is an .RQL file now included as part of a Rational RequisitePro project. This .RQL file holds the database connection information and is not versioned. Additionally, in this particular example, since MS Access was selected as the database type, it is also shown in the view. However, like the RQL file, it is not versioned. Rather you can think of the database as a working cache of the persistent versioned data stored in the XML files and Word documents.

Conclusion

With the release of Rational RequisitePro 2001, users can now baseline their requirement assets with the rest of their development lifecycle artifacts using Rational Unified Change Management (UCM). This provides the requirements user with several key benefits:

- Ability to include requirement assets as part of a UCM project baseline
- Ability to create new requirements projects from existing UCM project baselines (sometimes referred to as “branching” your requirements)
- Ability to restore a project from an existing UCM project baseline

About Rational Tools

About Rational RequisitePro

Rational RequisitePro is a flexible, easy-to-adopt requirements management tool used for documenting, organizing and managing requirements throughout the development lifecycle. RequisitePro increases the likelihood to deliver quality systems on time and on budget by unifying all team members — project managers, QA managers, testers, developers, etc. — by communicating and managing all project requirements.

About Rational ClearCase-LT

Rational ClearCase LT is a software configuration management solution for project workgroups. ClearCase LT offers Unified Change Management (UCM), Rational's "best practices" based, out-of-the-box process enabling project teams to manage change at the activity level and control workflow. Enterprise customers requiring distributed servers or server replication can upgrade to ClearCase from ClearCase LT without changing their process, data or the way they work.



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