

## **IBM® Rational® Rhapsody® Gateway Add On**



## **DOORS Tutorial**



***Rhapsody<sup>®</sup>***

**IBM<sup>®</sup> Rational<sup>®</sup> Rhapsody<sup>®</sup>  
Gateway Add On**

**DOORS Tutorial**



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# Getting Started

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## About this Document

This document introduces the purpose and functionality of the Rhapsody Gateway through a Tutorial execution.

## What is Rhapsody Gateway?

The Rhapsody Gateway provides an interface for bi-directional information exchange with third party requirements and authoring tools.

The Rhapsody Gateway offers the following advantages:

- ◆ Enables you to see the upstream and downstream impact of requirement changes, in real time.
- ◆ Enables you to link requirements to model elements and analyzes the coverage of the requirements. The impact of requirement changes can be viewed and analyzed.
- ◆ The Gateway provides full compatibility with SysML 1.0, UML 2.0, and DoDAF Version 1.0. Tracing of requirement links and analysis of those links can be achieved between UML 2.0 model elements and SysML requirement documents.

Rhapsody Gateway allows Rhapsody to hook up seamlessly with third-party requirements and authoring tools for complete requirements traceability.





# Creating a Rhapsody Gateway Project

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## Prerequisite

The `elevator` model is available in your `<Install Rhapsody>/Samples` folder. The same model exists for both C++ and C. This Tutorial uses the C++ model.

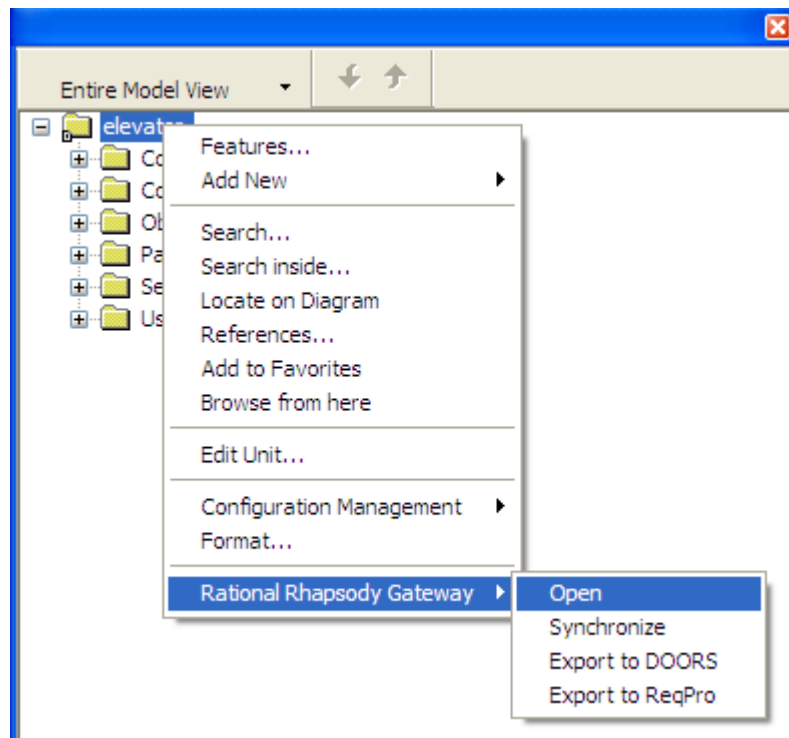
To execute this Tutorial, the `Elevator_Specs.dma` file needs to be first imported in DOORS to create a formal module.

Create a new DOORS project named `DOORS_elevator` to restore `Elevator_Specs.dma` available from the `<Install Gateway>/doc/DOORS Tutorial/` folder.

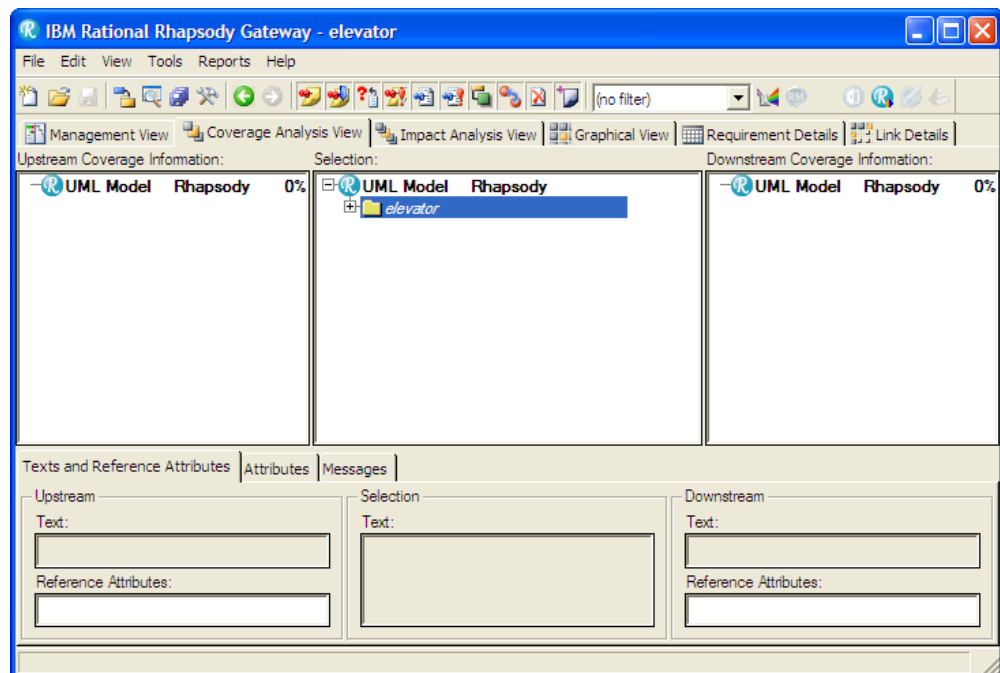
## Accessing the Rhapsody Gateway from Rhapsody

Rhapsody Gateway cannot run without Rhapsody running.

1. Start Rhapsody.  
Load the **elevator** project into Rhapsody by browsing to `<Install Rhapsody>/Samples/CppSamples/Elevator` and selecting the `elevator.rpy` file.
2. In the browser, click **elevator** at the top level of the project, then right click **elevator**.
3. From the contextual menu, select the **Rational Rhapsody Gateway > Open** menu item:




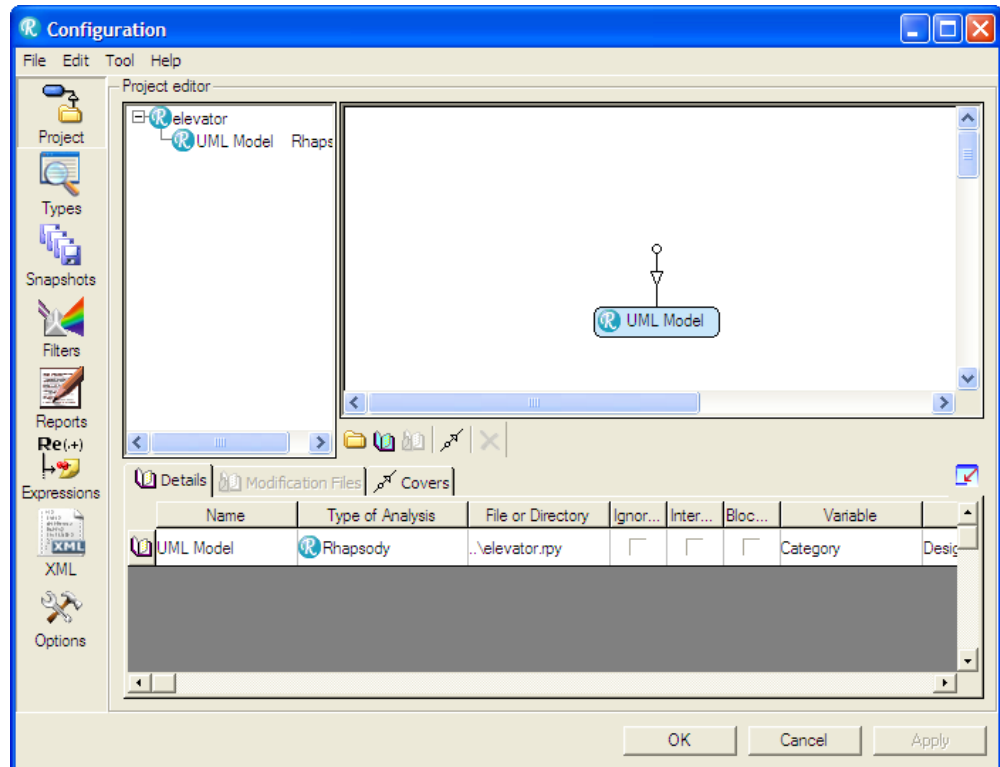
4. The Rhapsody Gateway starts and the **Coverage Analysis View** appears by default:





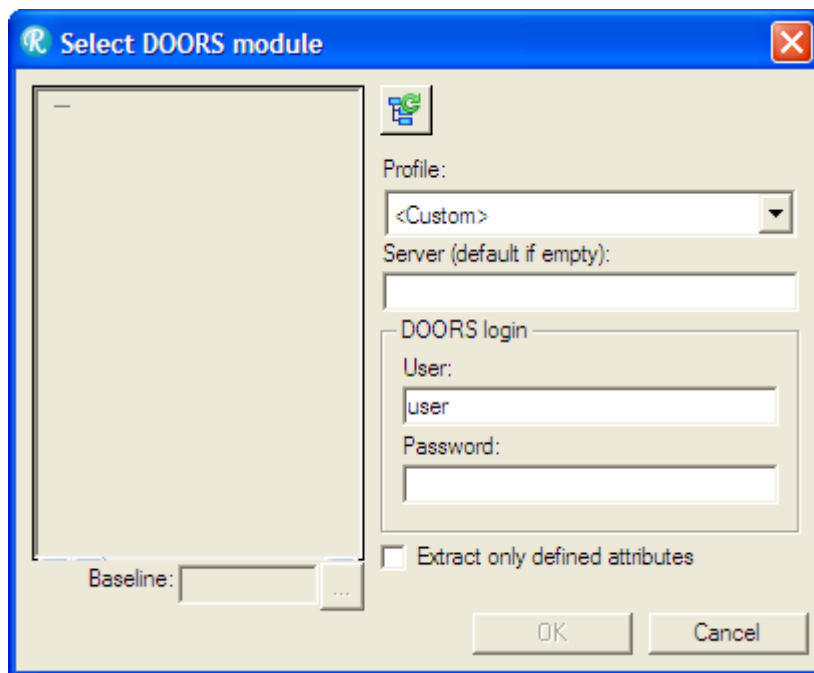
When the Rhapsody Gateway is launched, two windows are always opened on the desktop: the Rhapsody window and the Rhapsody Gateway window.

## Adding DOORS Requirements into the Project

1. From Rhapsody Gateway, click the **Edit Project** button  from the menu bar. The project configuration window opens:



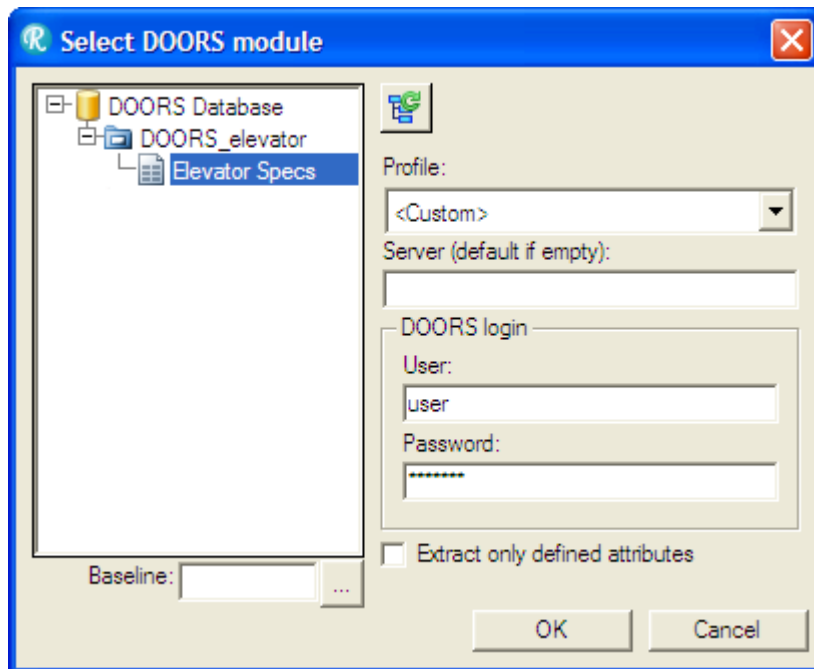
2. Click the **Add a document** button  under the work area. Click to drop off the new document into the work area.
3. By default the document is named **Document1**. Click on **Document1** in **Name** then rename this document **Requirements**. Click on **Type of Analysis** list and select **Doors Basic** from the drop-down list.
4. Click on **File or Directory** then click the Browse button .
5. The **Select DOORS module** dialog box opens:




Enter your password.

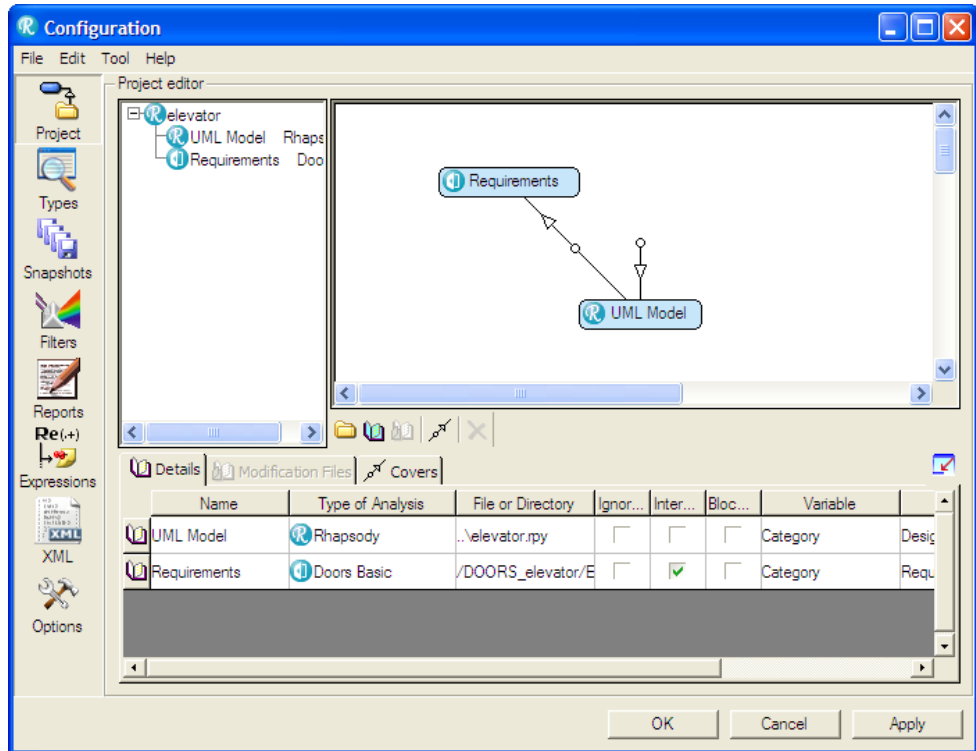
Click on the **Update DOORS tree** button .

6. Expand the **DOORS Database** contents. The **DOORS\_elevator** appears in the **Select DOORS module** browser dialog box and the **Elevator Specs** underneath it.  
Click to select the **Elevator Specs**.



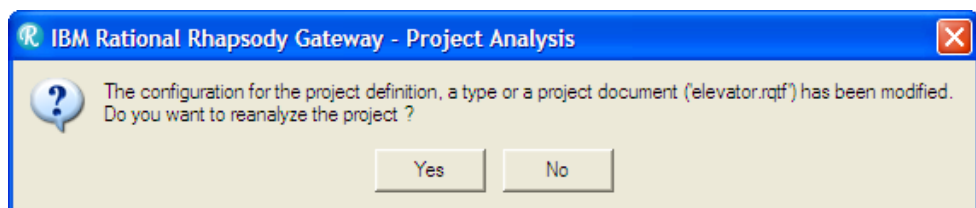
Click the **OK** button in the **Select DOORS module** dialog box.

7. Now, in the Project Configuration, select the **Add a cover** button  to add a coverage link. Establish the connection between the model and the requirements. Note that the arrow direction is important. The model always covers the requirements. So the direction of the arrow always goes from the model to the requirement document.



Click **OK**.

8. Click **Yes** when the dialog box appears prompting you to reanalyze the Rhapsody Gateway project.



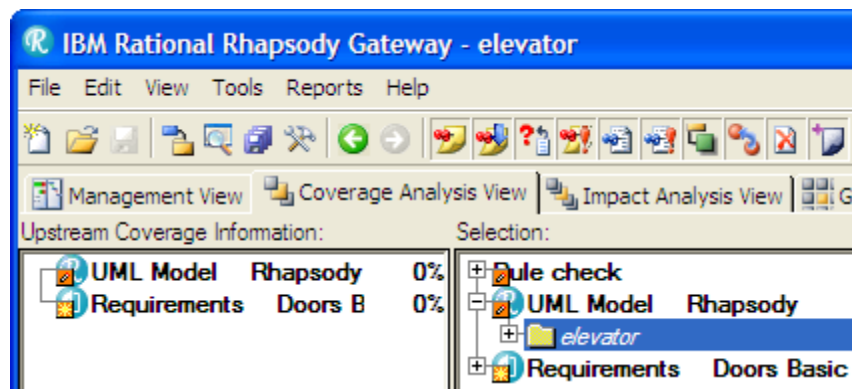
The DOORS requirements are now imported into the Rhapsody Gateway.

The connection between the UML model and the requirements covered by the model is established.

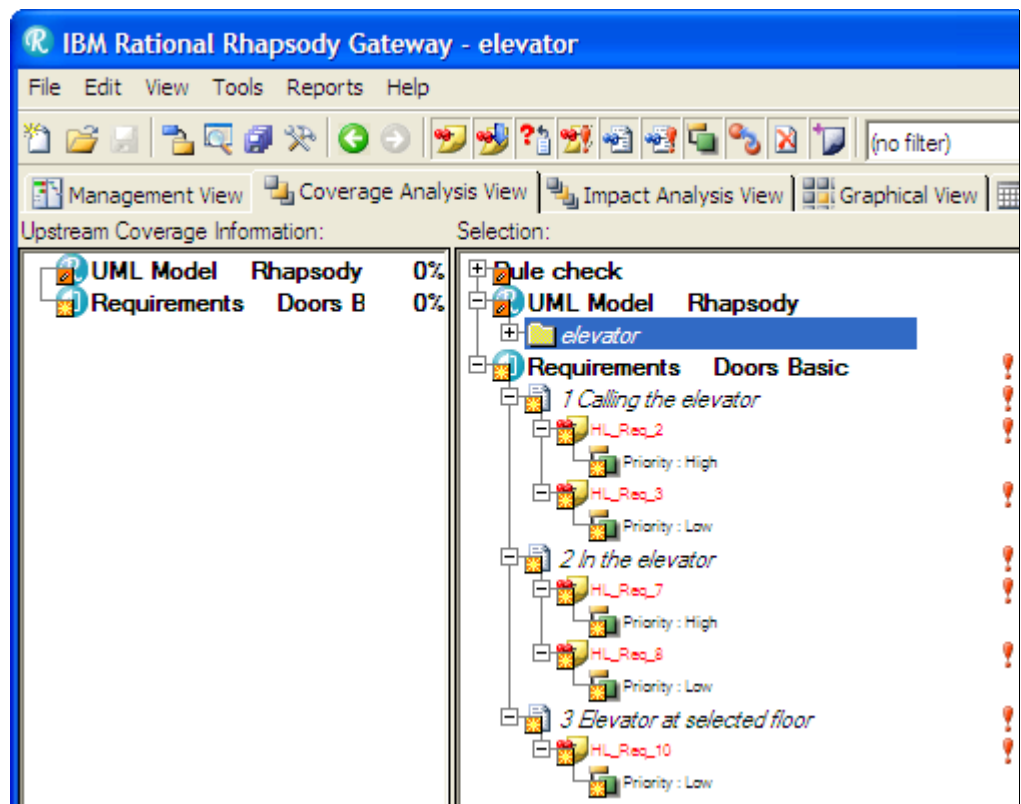
## Analyzing DOORS Requirements

Importing DOORS Requirements into Rhapsody Gateway means creating a Rhapsody Gateway project then inserting DOORS Requirements into the project.

1. Return to the Rhapsody Gateway **Coverage Analysis View**.  
Check there are 2 documents there now:



2. Expand the **Requirements** and confirm the uncovered requirements are red:

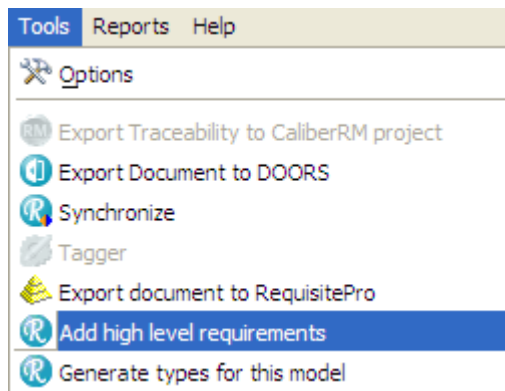


Note that the sun symbol ☀ indicates the new added elements.

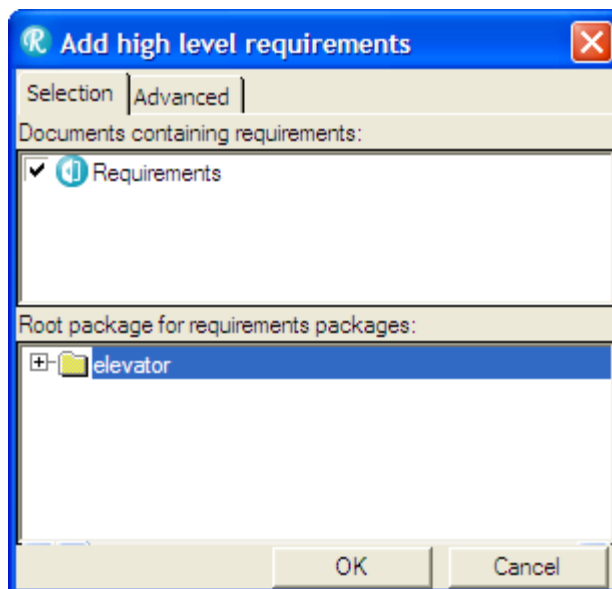
## Adding High Level Requirements into Rhapsody

Once you added the requirements into the Rhapsody Gateway and the coverage between the requirements and the model, you must add the requirements into Rhapsody. This is done using the **Add high level requirements** option.

1. Click to select the **UML Model Rhapsody**. Select **Tools>Add high level requirements**.



2. The **Add high level requirements** dialog box appears. Click the **elevator** project in the browser view of the **Add high level requirements** dialog box:



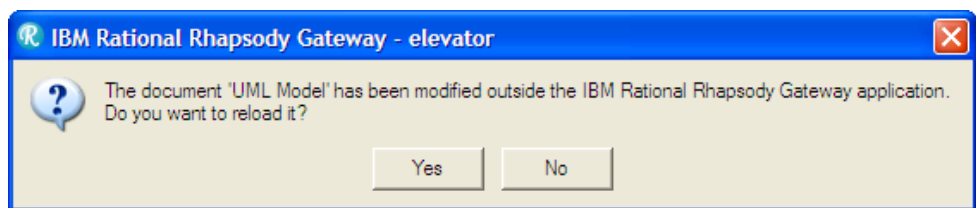
Click **OK**.

3. A message box opens to indicate that 5 requirements have been added:



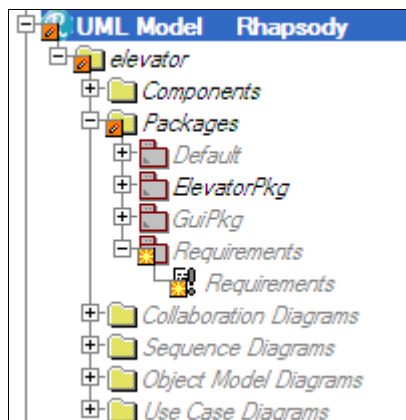
Click **OK**.

4. When the UML Model is not up to date, a dialog opens to ask for reload:



Click **Yes**.

5. From the Rhapsody Gateway **Coverage Analysis View**, select the **UML Model Rhapsody**.

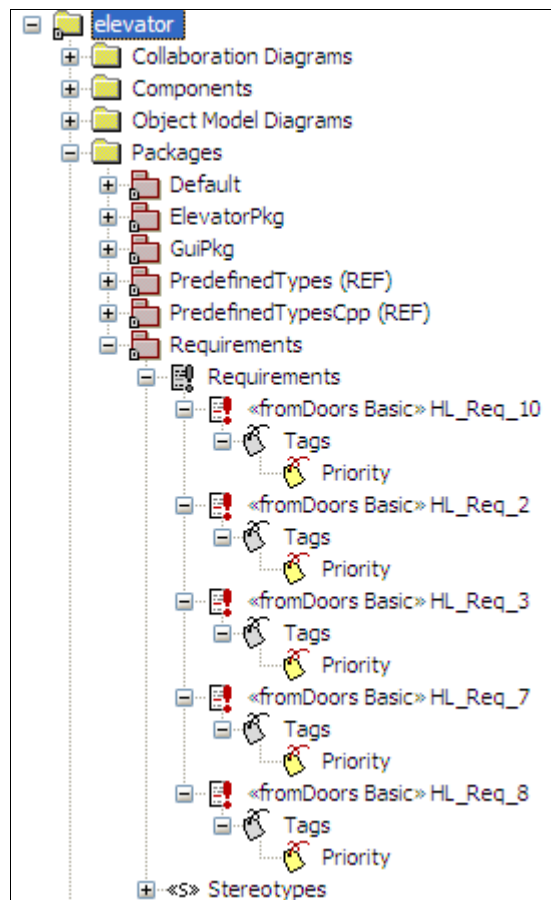


Check that an orange icon appears on **UML Model Rhapsody**, **elevator** and **Packages**, to indicate that a modification has occurred.

Check that a sun symbol appears next to **Requirements**. Note that the requirements are named exactly as they were named in the **Name** field in the Project configuration view. The DOORS requirements are in the **Packages** folder and are called **Requirements**.



6. Return to Rhapsody and, in the **Packages** folder, click to expand the **Requirements** folder. Check that 5 requirements are listed with the **fromDoors Basic** stereotype:

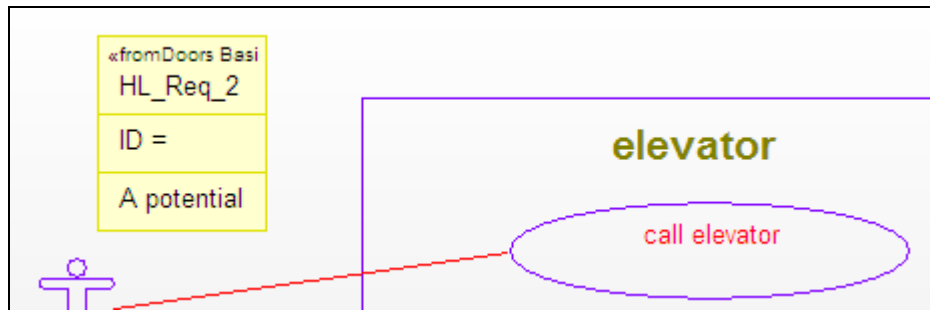



The requirements are now successfully added into Rhapsody.

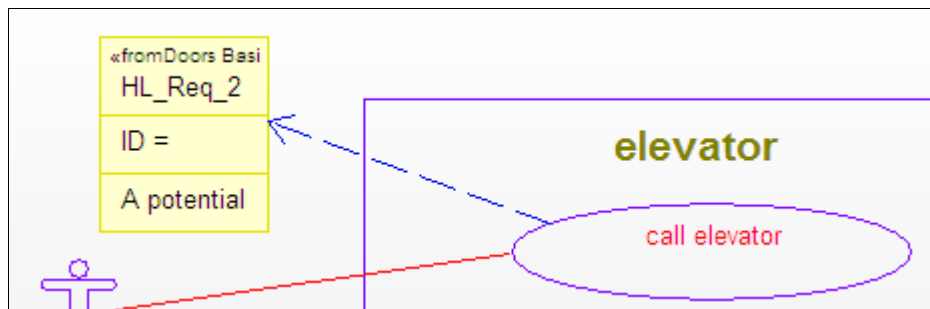
## Creating Covering Links in a Rhapsody Model

Now the requirements need to be associated to model elements. One way to create these associations is to create some dependencies.

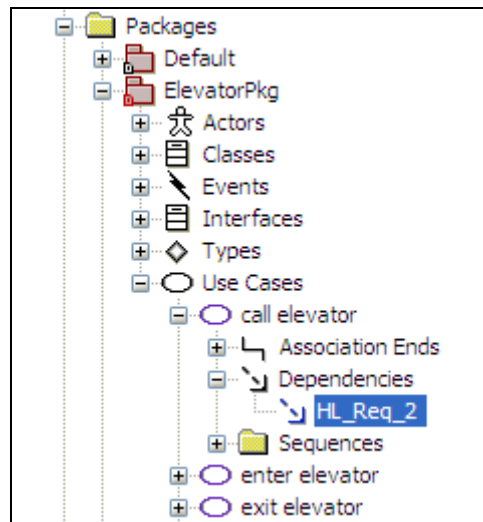
1. Expand the **Use Case Diagrams** folder then double-click the **main uses** diagram. The main uses diagram opens in the Rhapsody work area.
2. Select the **HL\_Req\_2** requirement in the browser and drag it onto the main uses diagram. From the graphical view, select **HL\_Req\_2** and display the text information by choosing **Notation Style > Box Style** option from the contextual menu.



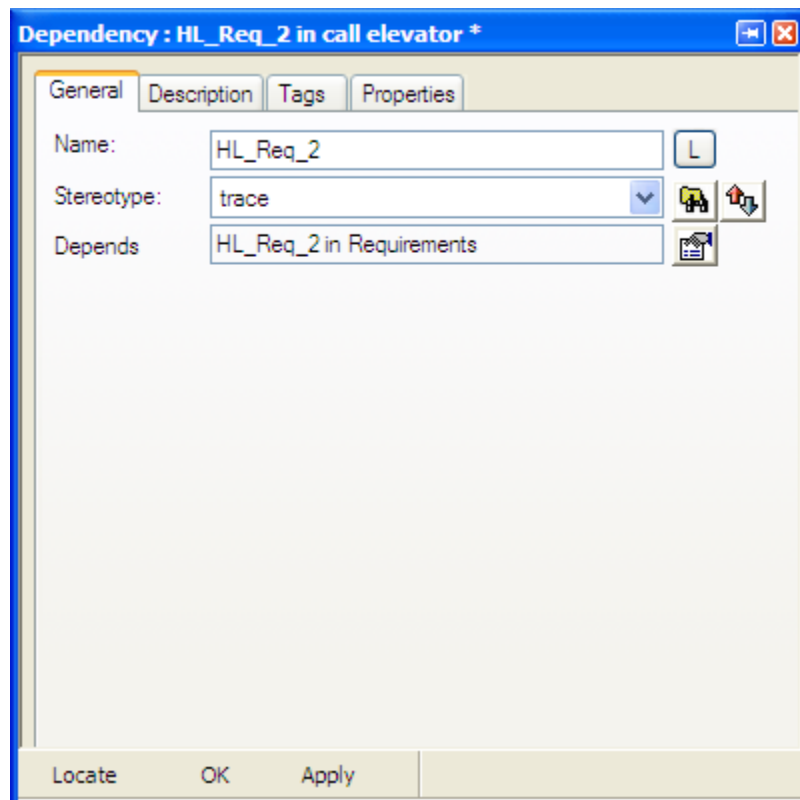
3. Click the **Dependency** button  from the Rhapsody toolbar. Create a Dependency line from the **call elevator** use case to **HL\_Req\_2** on the diagram. The dependency link is shown in the graphical view:



The dependency is also displayed in the tree underneath the **call elevator** Use Case:



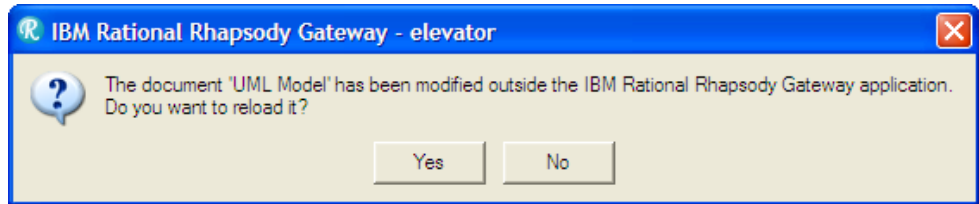
4. Double-click the dependency, the dependency properties dialog box opens. In this dialog box, select **trace** from the **Stereotype** drop-down list:



Click **OK**.

5. Click the **Save** button .

6. Now return to Rhapsody Gateway to take these changes into account. Click **Yes** when the following dialog box appears prompting you to reanalyze the Rhapsody Gateway project:

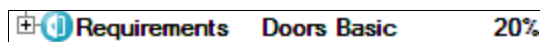


## Analyzing the Rhapsody Model

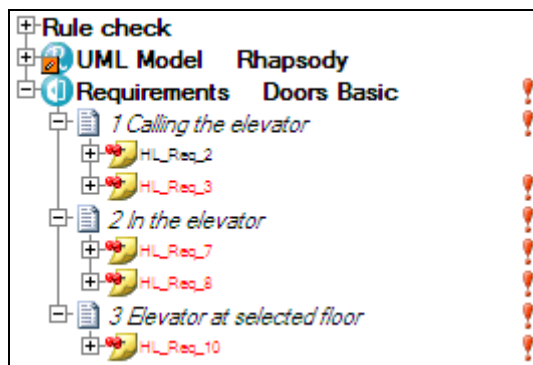
Once a link is made between a requirement and a model element, the Rhapsody Gateway provides analytic information:

- ◆ Covered requirements appear as the color black and uncovered requirements appear as the color red.
- ◆ The number of uncovered requirements is indicated in the Management View.
- ◆ Specific information about what model element covers a specific requirement is also displayed.
- ◆ Requirement text descriptions are provided, the text requirement can be seen directly in Rhapsody Gateway.

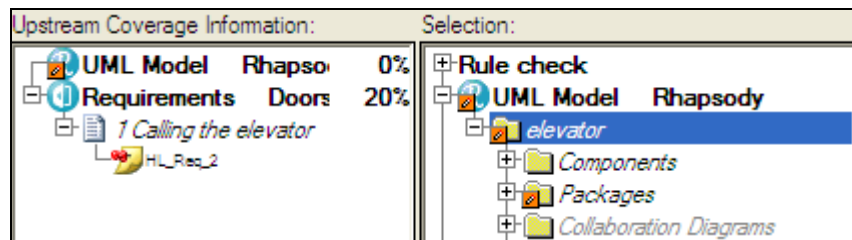
1. Once some dependencies have been created from Rhapsody, consult the **Project Summary** from the Rhapsody Gateway **Management View**. This summary says there are 5 requirements but 4 requirements are uncovered.
2. In the **Management View**, check that **20%** is displayed next to the **Requirements Doors Basic**. This is the covering ratio of this document.



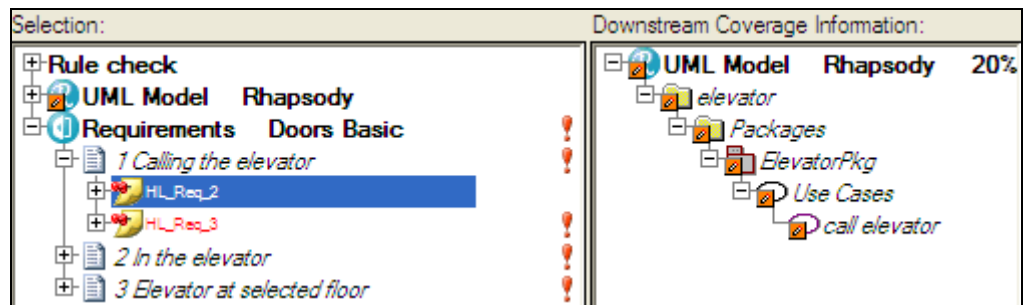
3. Select the **Coverage Analysis View**. In the **Selection** column, expand the **Requirements Doors Basic** folder. In the requirements listed, check that **HL\_Req\_2** has turned to black indicating it is now covered.



4. Under the **UML Model Rhapsody**, in the **Selection** column, highlight the **elevator** project. In the **Upstream Coverage Information** column, check the **HL\_Req\_2** requirement appears covered by elevator model elements.



5. Click **HL\_Req\_2** in the **Selection** column. Confirm that in the **Downstream Coverage Information** column, the **call elevator** use case is shown providing coverage for **HL\_Req\_2** requirement.



In the previous example, we only showed one coverage creation. To improve the coverage ratio, the previous process needs to be executed for other requirements.

## Overview of Miscellaneous Rhapsody Gateway Features

### Export to DOORS Feature

Once some traceability changes have been made to a Rhapsody model element, it may be useful to upload them back to DOORS. This process can be done using the **Export Document to DOORS** option. This begins the synchronization between DOORS information and Rhapsody model elements. The links will be maintained in DOORS.

See the *Coupling DOORS* document to have details.

### Requirements Modification Impacts

Modifying requirements in DOORS can be synchronized back to the model. Changes on requirements imply an **Add high level requirements** to provide information to Rhapsody.

See the *Coupling Rhapsody* document to have details.

### Snapshots and Marks

Features such as snapshots and marks are available in the Rhapsody Gateway tool, in order to help to identify the impacts of the changes on the other elements of the traceability chain.

The **Snapshot editor** allows the user to compare analysis results between saved archives.

The **Marks** highlight the modified requirements to manage individual impact analysis or can be use during a reviewing process.

See the *User Manual* to have details.