



ReqTracer Getting Started

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Table of Contents

Chapter 1	
Introduction.....	5
Product Overview	5
Learning ReqTracer	6
Chapter 2	
Starting ReqTracer.....	7
Main Window	7
Menu Bar	7
Toolbar	7
Project Workspace	8
Status Bar	9
Configuration Dialog Box	9
Chapter 3	
Managing Requirements	11
Creating a Project.	11
Adding a Document	12
Adding a Covering Document	13
Using the Management View	15
Chapter 4	
Analyzing Requirements	17
Analyzing the Project	17
Using the Coverage Analysis View	19
Adding a Cover	20
Using the Impact Analysis View	22
Modifying a Document	22
Adding a Second Downstream Document	23
Reviewing the New Documents	24
Performing Impact Analysis	25
Using the Graphical View	27
Chapter 5	
Generating Reports.....	31
Generating a Built-in Report	31
End-User License Agreement	

In this chapter, you will obtain a general overview of managing requirements and you will learn about the different windows in the ReqTracer application.

Product Overview

ReqTracer is a requirements traceability solution that links your development and verification documents with formal requirements stored in documents and databases.

Most engineering projects start by defining high-level specifications, followed by more specifications as the project progresses. Specifications contain technical and procedural requirements that guide the product through each engineering phase. In addition, working documents, such as hardware schematics, simulation models, software source code specifications and procedures must adhere to and cover the requirements defined by specifications.

ReqTracer allows you to configure which specification and working documents to process, the type of traceability information to obtain from each type of document, and the traceability relationship between these documents. ReqTracer performs the coverage and impact analysis, graphically displays relationships between documents and generates reports. ReqTracer improves the impact analysis throughout a project lifecycle and the quality by managing requirements traceability.

ReqTracer is an effective solution for enhancing project management traceability information, coming from any source.

ReqTracer includes the following features:

- Manage project documents and graphically create traceability relationships between documents
- Customize types for importing various types of data from third party products
- Use graphical, coverage analysis and impact analysis views to visualize and analyze traceability relationships between documents
- Create filters to customize analysis and displays
- Capture and compare project snapshots to determine changes in requirements and coverage
- Generate reports using default and custom templates

Learning ReqTracer

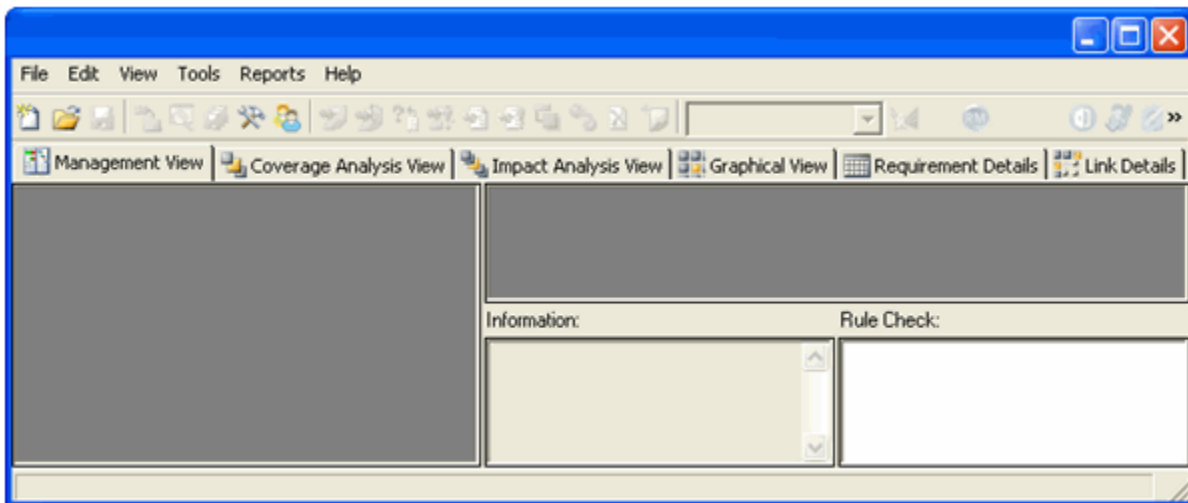
The best way to familiarize yourself with ReqTracer is to complete the following tasks:

- Read this Getting Started guide to start with the main windows, concepts and features.
- Train yourself with the Getting Started example.
- Review the other sections in the *User Manual* and familiarize yourself with all the windows, features and analysis results calculations.

Chapter 2

Starting ReqTracer

When you launch ReqTracer, the main window appears:



Main Window

The main window has four main parts: the menu bar, the toolbar, the project workspace, and the status bar.

Menu Bar

The menu bar contains the following menus: File, Edit, View, Tools, Reports and Help. Browse the menus in the main window to familiarize yourself with their contents. The status bar will display a brief explanation of the menu item as you hover over it with the mouse.

Toolbar

The toolbar contains shortcuts to commonly used selections of the menu bar. As shown below, the toolbar contains the following sections: **Standard**, **Configuration**, **Navigation**, **View Options**, **Filtering** and **Third Party**.



- Standard and Access Control (1) — Contains buttons for creating, loading and saving project files. Save is locked by user during modifications
- Configuration (2) — Contains buttons for configuring projects, types, snapshots and options. Plug-ins can be added there.
- Navigation (3) — Contains buttons for applying navigation commands previously performed within the coverage information of the **Coverage Analysis**, **Impact Analysis views**, **Graphical View** and **Requirement Details**. It is only available for these views.
- View Options (4) — Contains buttons to control which requirement elements are visible in the **Coverage Analysis**, and **Impact Analysis** views.
- Filtering (5) — Contains the Filter drop-down list box to configure and apply filters. These filters specify the conditions by which to include requirements in analysis or views.
- Third Party Tools and Plug-ins (6) — Contains additional buttons that apply to specific third party products, such as DOORS, and/or plug-ins.

Project Workspace

The project workspace is the main area of the application. This area displays the project information and analysis for the loaded project. The project workspace contains multiple view tabs for displaying the contents of the project. Each view may contain one or more panes.

The project workspace contains the following views:

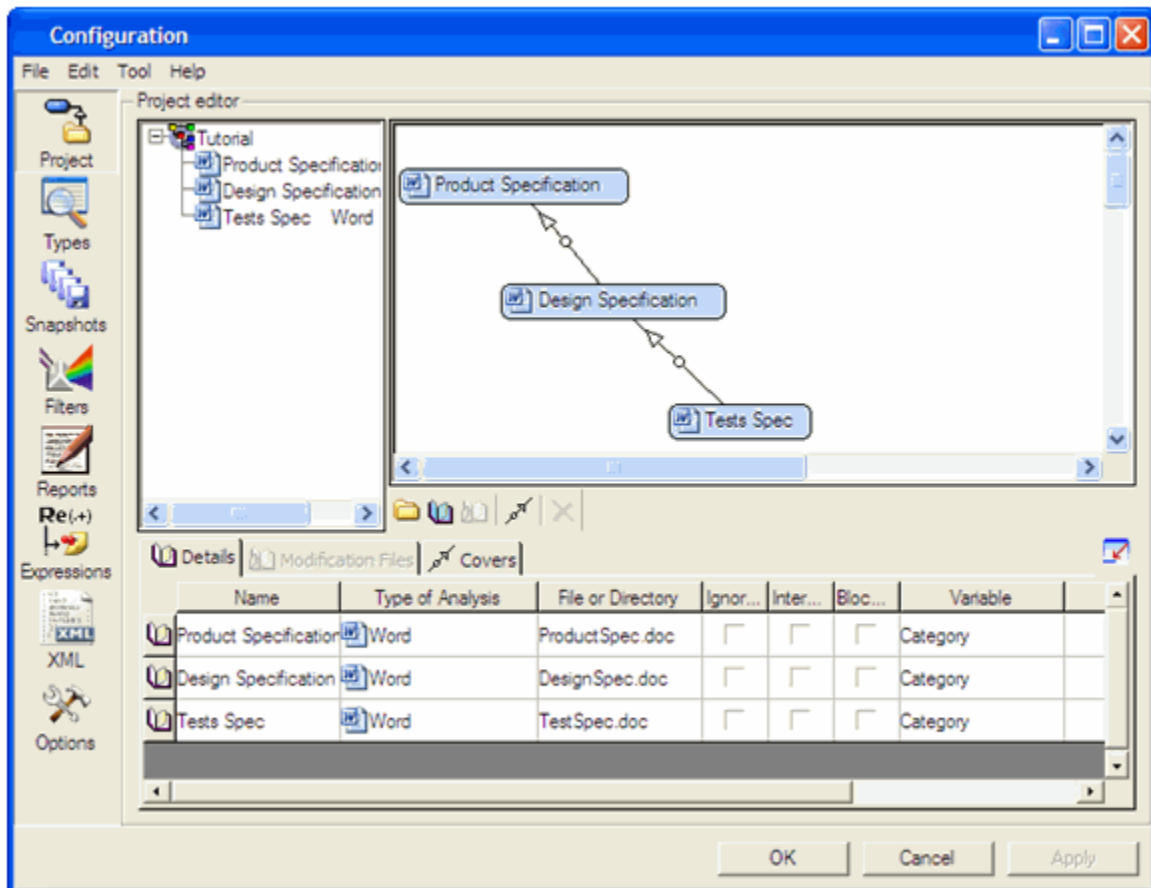
- **Management View** — Displays the documents in the project and a summary of coverage information for the project.
- **Coverage Analysis View** — Displays all levels of covering elements, N-m, and all levels of covered elements, N+p, for a selected element of a document. These covered and covering elements come from other documents as defined by the project.
- **Impact Analysis View** — Displays one level of covering elements, N-1, and one level of covered elements, N+1, for a selected element of a document. These covered and covering elements come from other documents as defined by the project.
- **Graphical View** — Displays each document graphically using a tree view with lines connecting requirement elements in documents and covering elements in other documents.
- **Requirement Details** — Displays each requirement and its attributes for a document in a table.
- **Link Details** — Displays covering information between a covering document and its covered documents.

Status Bar

The status bar displays common information in the application, such as descriptions for menus or status while performing analysis.

Configuration Dialog Box

ReqTracer launches the **Configuration** dialog box when you select a menu item or toolbar button to configure one of the following parts of your project: **Project**, **Types**, **Snapshots**, **Filters**, **Reports**, **Expressions**, **XML** or **Options**.



The Configuration dialog box contains the following panes:

- **Project** — Allows you to configure the project by specifying the documents to include, the type of each document, and the covering relationship between documents. Refer to the Project Configuration chapter in the *User Manual* for more information about configuring projects.
- **Types** — Allows you to create new types or customize existing types for your project. Refer to the *Customization Guide* for more information about customizing types.

- **Snapshots** — Allows you to create, manage and compare snapshots of your project. Refer to the Managing Snapshots chapter in the *User Manual* for more information about using snapshots.
- **Filters** — Allows you to define custom filters to analyze requirements and only display requirements from documents that meet specific criteria. You can enable filters using the Filter drop-down list box on the toolbar of the ReqTracer main window. Refer to the Filter section in the *User Manual* for more information about using filters.
- **Reports** — Allows you to define new custom reports. You can generate a default report or a custom report using the **Reports> Library Reports** submenu on the main window. Refer to the Generating Documentation chapter in this Manual, and to the User Manual for more information about generating documents.
- **Expressions** — Allows you to test regular expressions. You can specify source text and a regular expression, and the pane will display the captured text returned by the regular expression.
- **XML** — Allows you to test XML syntaxes. You can specify source text and an XML syntax, and the pane will display the captured text returned by the XML syntax.
- **Options** — Allows you to set the default font for text in the application, set the password on the project, and define environmental variables and other miscellaneous settings for the application.

Chapter 3

Managing Requirements

In this chapter, you will learn about the different windows in ReqTracer by creating a project, adding existing documents to the project and reviewing the contents of the documents and the views in ReqTracer.

A project specifies the documents that ReqTracer analyzes and displays, as well as the type of each document. A type defines how to select external files that represent a document, how to read the contents of the external files, how to interpret the contents as elements for managing requirements and how to display the elements of the document.

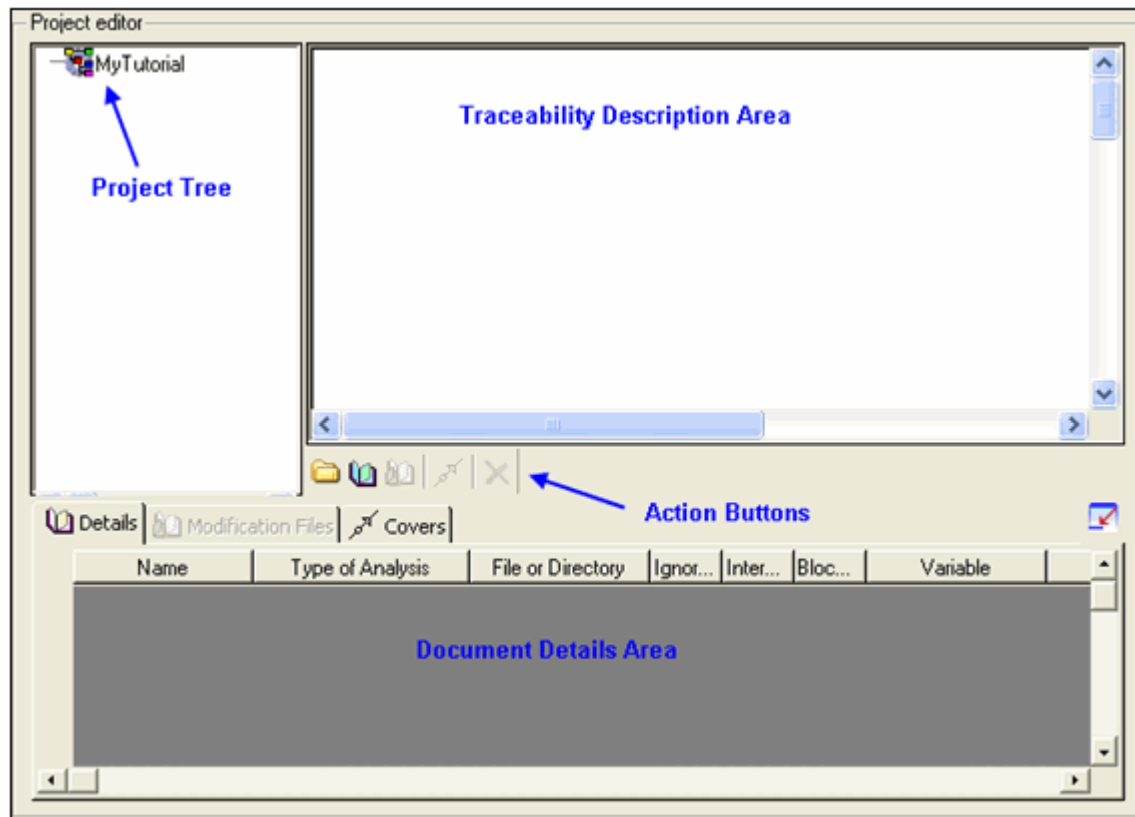
Creating a Project

The exercises in this manual use the files located in the `<ReqTracer>\examples\Use Cases\Getting Started` directory. A `Tutorial` project example is delivered in this directory.

To create your own `Tutorial` project, you will start the ReqTracer application and create a new project. You will add and configure documents in the project, review the contents of the documents and review the views in the ReqTracer project workspace.

1. Launch the ReqTracer application by selecting `Start > Programs > <ReqTracer group> > ReqTracer`. You will now see the ReqTracer main window.
2. Select **File > New...** to launch the **Create a New Project and Save As** dialog box and create the project.
3. Enter `MyTutorial` in the File name field, select the directory to create the project then click **Save**.
4. ReqTracer creates a new project file `MyTutorial.rtqf` in the selected directory and displays the **Project** pane of the Configuration dialog box as shown in the following figure.

A project file defines the documents in which ReqTracer will read the type of each document and the covering relationship between these documents.

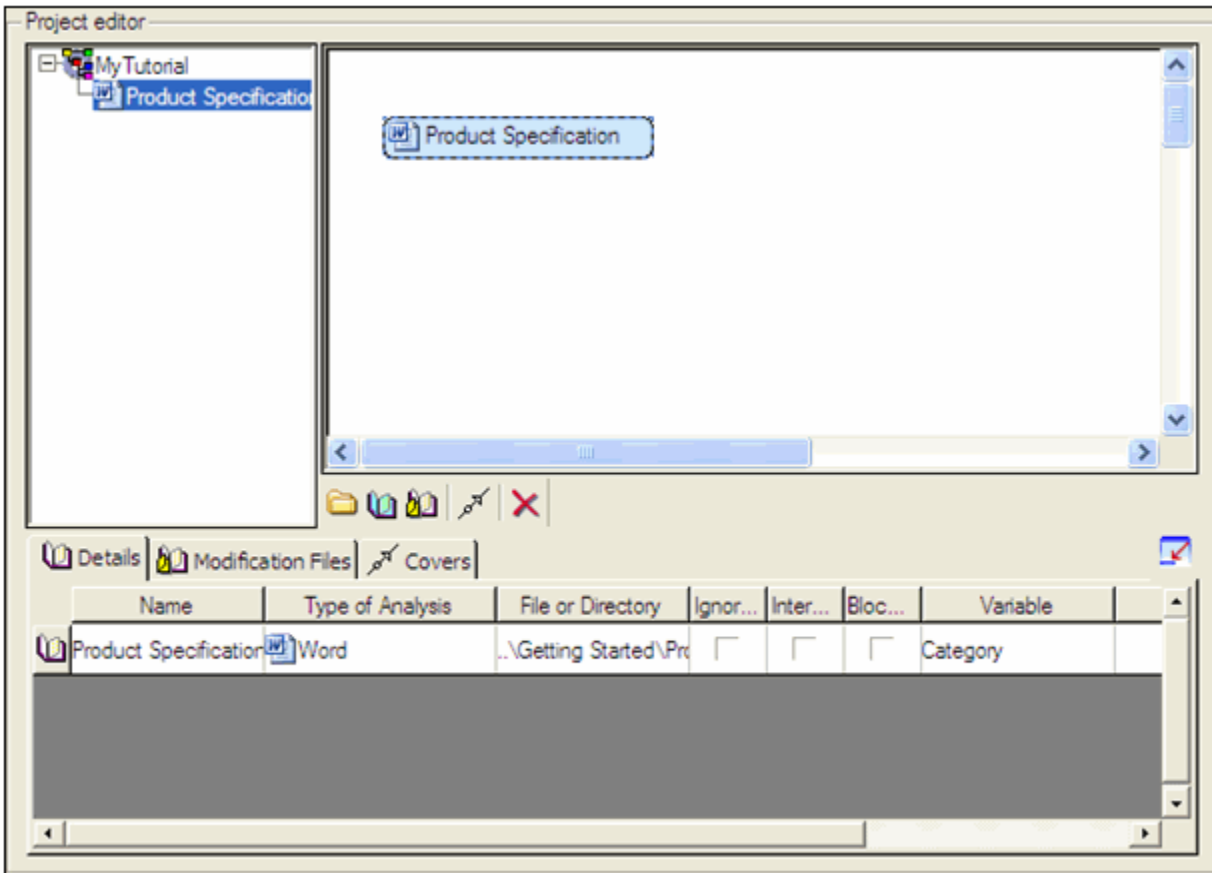


Adding a Document

After you create your project, you will add a Microsoft Word specification document to the project.

1. Click the **Add a document** button. When you make this selection, the cursor automatically moves to the Traceability Description Area and the cursor outlines a document object. Click within this area to place the document. When you place the document, the document is added to the Project Tree pane. The Document Details Area displays the settings for the selected document.
2. In the Document Details Area, click on the **Name** column to select the `Document1` text. Type `Product Specification` and press **<Enter>** to rename the document. The name in the document object now displays the new name.
3. Click on the **Type of Analysis** column. Select `Word` in the drop-down list box.
4. Click on the **File or Directory** column. The File Browse button appears on the right side of the control. Click the File Browse button and select `<ReqTracer>\examples\Use`

Cases\Getting Started\ProductSpec.doc. The following figure shows the completed Configuration dialog box.

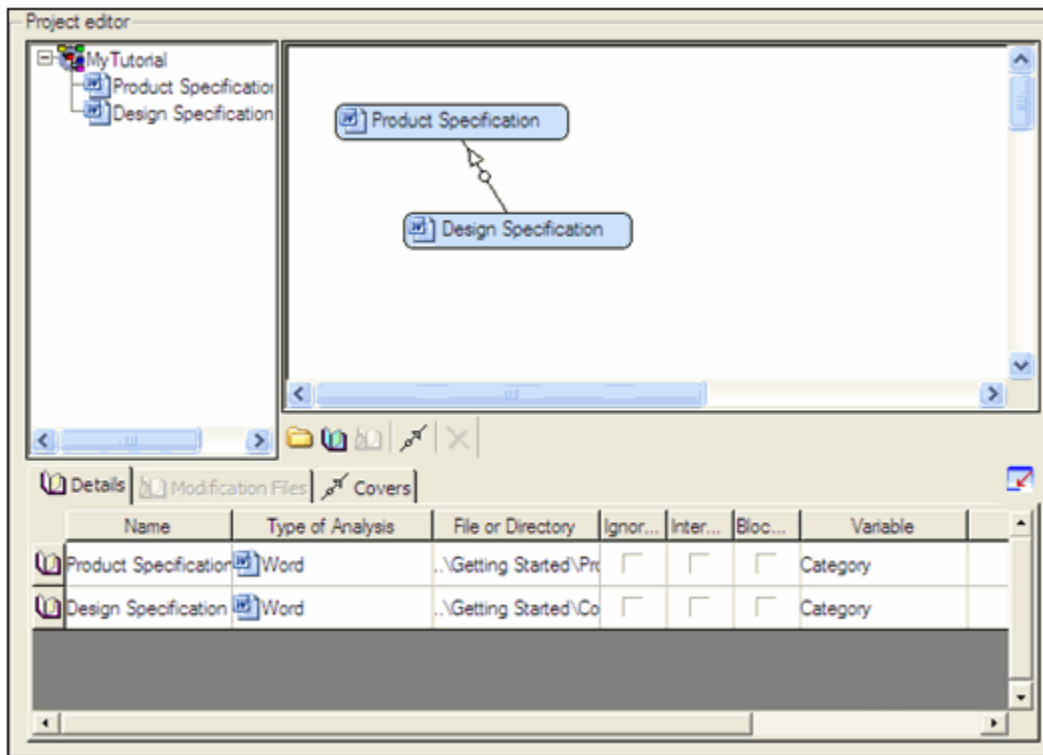


Adding a Covering Document

A **covering document** is a document that contains references to requirements that are defined in another document. You will now add a new document to the project that covers the `Product Specification` document.

1. Click the **Add a document** button to add a second document object in the Traceability Description Area. Place the document below the `Product Specification` document.
2. In the Document Details Area, configure the document as follows:
 - o **Name:** `Design Specification`
 - o **Type of Analysis:** `Word`
 - o **File or Directory:** `<ReqTracer>\examples\Use Cases\Getting Started\CoveringSpec.doc`
3. Click the **Add a cover** button. The cursor moves to the Traceability Description Area. Click the `Design Specification` document object first and then click the `Product`

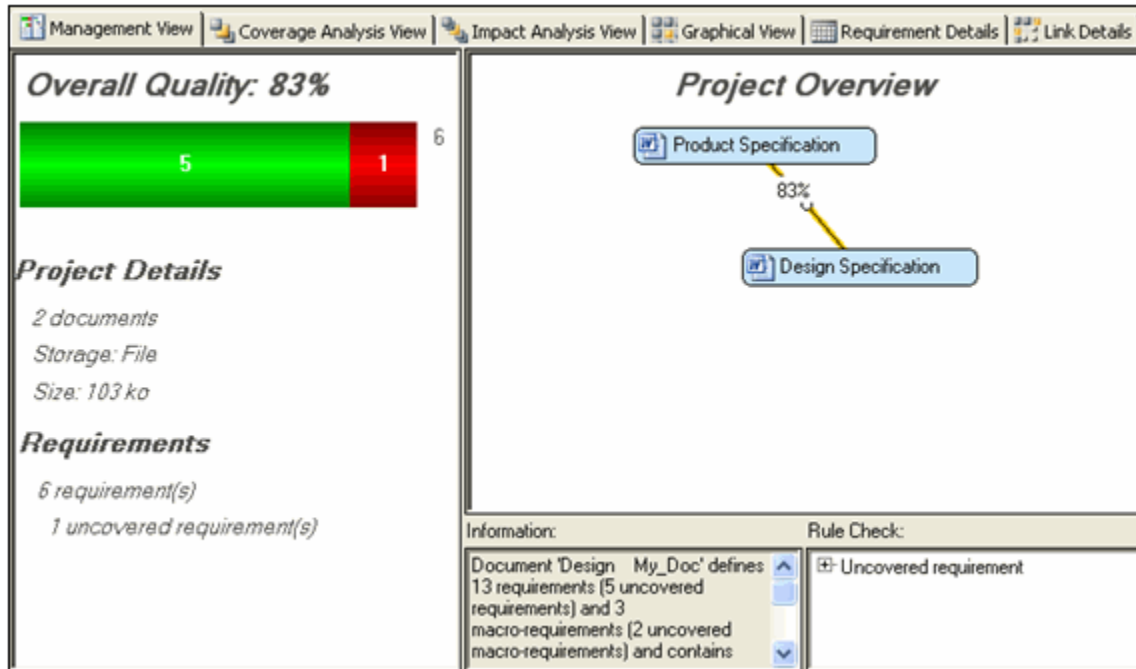
Specification document object. An arrow appears between the two documents as shown in the following figure. This arrow indicates that the Design Specification document covers the Product Specification document.



4. Click **OK** to save and close the Configuration dialog box.

Using the Management View

After you close the Configuration dialog box, the main window appears as shown in the following figure.



The **Management View** displays the project in the Project Overview area. The project has two documents and its coverage ratios is 83%.

The **Overall Quality** pane indicates that the project has six requirements defined and one error which is an uncovered requirement. The percentage of requirements without errors is 83%.

Perform the following tasks to acquaint yourself with the **Management View** and the documents that you have included in the project.

1. Right click the *Product Specification* in the **Project Overview** and select **Navigate** from the context menu. ReqTracer displays the *ProductSpec.doc* file in Microsoft Word.
2. Review the contents of the file in Word. The file contains three types of elements: sections, requirements and text. The default Word type in ReqTracer interprets the contents of the file as follows:
 - A **section** is defined by Word heading styles.
 - A **requirement** is defined using the Word style “Requirement_ID”. This can be customized to capture an identifier that contains a set of arbitrary characters, and ends with a numeric value. The label for the requirement is after the identifier and is delimited by a colon character.

- Any text using the Word style “Requirement_Text” is associated with the previously specified element. If an initial text element is specified at the beginning of the file, the text is associated with the document.
 - The `ProductSpec.doc` file specifies six requirements. The document can be closed.
3. In ReqTracer, right-click the `Design Specification` in the `Project Overview` and select `Navigate` from the context menu. ReqTracer displays the `CoveringSpec.doc` file in Word.
 4. Review the contents of the `CoveringSpec.doc` file in Word. The file contains section and text elements, but instead of requirement elements, the file contains requirement **references**. A requirement reference is defined by the prefix characters `[Covers: ,` followed by a set of characters that represent the requirement identifier, and completed with a closing bracket character.
The `CoveringSpec.doc` file specifies five requirement references. Notice that the `1.2. USB 2.0 Speeds` section of the document does not contain a requirement reference. This missing reference is discussed later in this exercise. The document can be closed.

Chapter 4

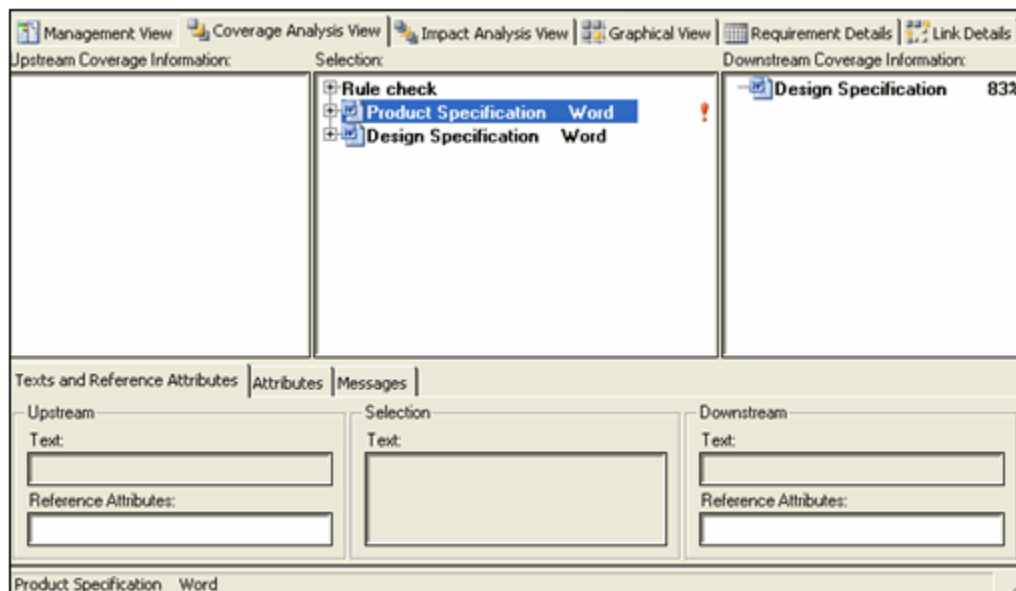
Analyzing Requirements

As explained in the previous chapter, *Managing Requirements*, the **Management View** summarizes the structure of the project and the coverage ratios. This chapter will teach you how to use the **Coverage Analysis View**, the **Impact Analysis View** and the **Graphical View** to obtain additional details about the requirements and the references that cover them.

Analyzing the Project

Complete the following steps to analyze requirement coverage for the project that you created in the *Managing Requirements* chapter.

1. Select the **Coverage Analysis View** tab in the main window. Ensure that the **Product Specification** and the **Design Specification** document elements in the **Selection** tree view pane are collapsed.
2. Click the **Product Specification** document element in the **Selection** column.



3. The **Downstream Coverage Information** column displays that the **Product Specification** document is covered by the **Design Specification** document, and the document covers only 83% of the requirements.
4. Expand the child elements of the **Product Specification** document in the **Selection** column.

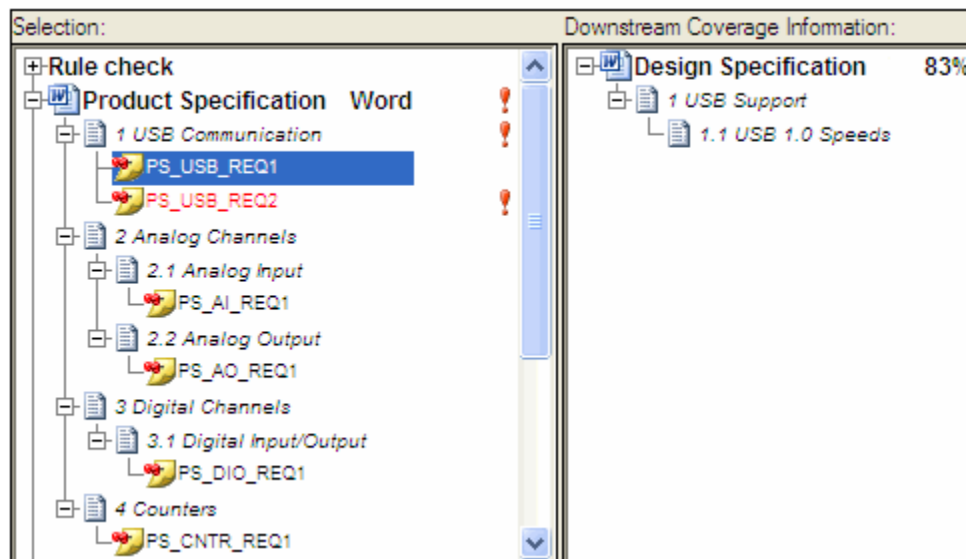
Note



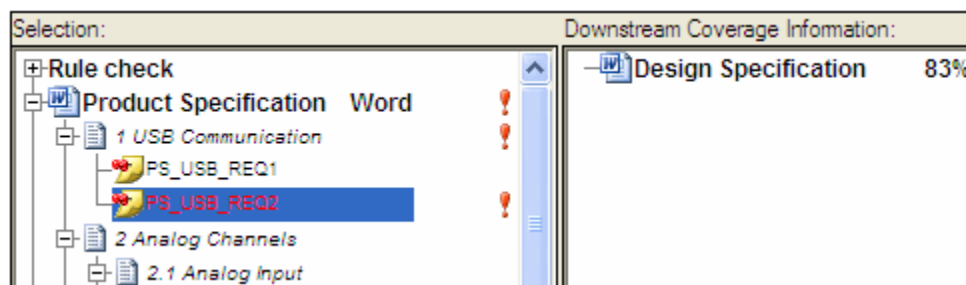
To expand a parent element and all its child elements, press <Shift> while clicking the plus icon to expand the parent element.

The tree view pane displays the section headings from the text file as parent elements and displays the requirements as child elements.

5. Select the PS_USB_REQ1 requirement. The PS_USB_REQ1 element represents a requirement specified in the document. Select the **Messages** tab which indicates that the PS_USB_REQ1 element is a requirement and that this requirement is covered. The **Downstream Coverage Information** column displays the 1.1 USB 1.0 Speeds section as a covering element because this section of the document contains a reference to the requirement. The tree view pane also includes the parent 1 USB Support section of the covering document.

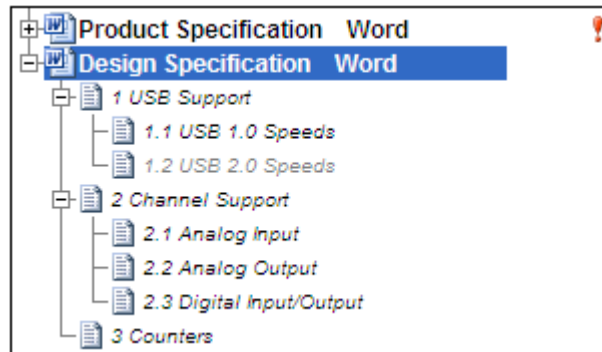


6. Select the PS_USB_REQ2 requirement. The **Messages** tab indicates that the PS_USB_REQ2 element is also a requirement; however, this requirement is not covered. ReqTracer highlights the name of the element in red. The **Downstream Coverage Information** column does not display any covering elements because the covering document does not contain a reference to the requirement.

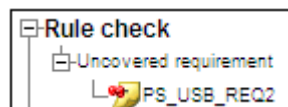


Collapse the **Product Specification** document in the tree view pane of the **Coverage Analysis View**.

7. Select the root element of the **Design Specification** document. The **Messages** tab indicates that the document contains references to five requirements.
8. Expand the child elements of the **Design Specification** document in the tree view pane, as shown in the following figure.



9. Select the **1.1 USB 1.0 Speeds** element in the tree. This element represents a section specified in the document. The **Messages** tab indicates that the section contains a reference to one requirement.
10. Select the **1.2 USB 2.0 Speeds** element in the tree. The **Messages** tab for this element indicates that the section is empty and contains no references to any requirements.
11. Collapse the **Design Specification** document in the tree view pane of the **Coverage Analysis View**.
12. Expand the elements of the **Rule check** item of the **Coverage Analysis View** as shown in the following figure. The Rule check tree contains a summary of the rules flagged while analyzing the project. For this project, the pane indicates that the **PS_USB_REQ2** requirement is uncovered.



Refer to the *Rules Check and Error Messages* chapter of the *User Manual* for more information concerning the various rules that ReqTracer defines.

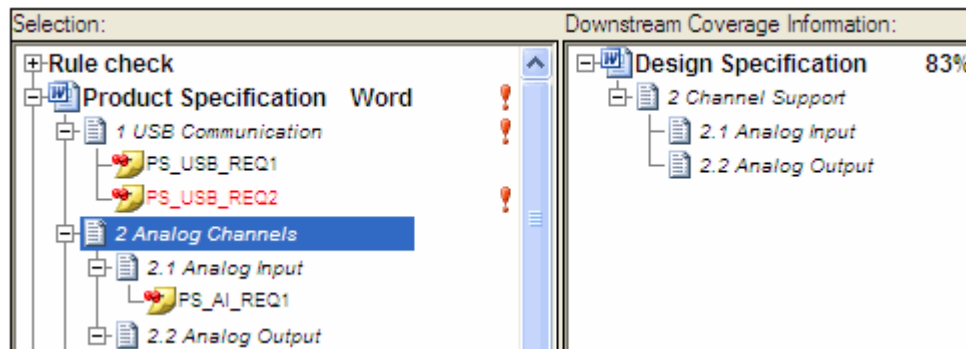
Using the Coverage Analysis View

The **Coverage Analysis View** displays the immediate downstream and upstream document. In this section, you will learn how to add a cover to the project and how to use the **Coverage Analysis View**.

Adding a Cover

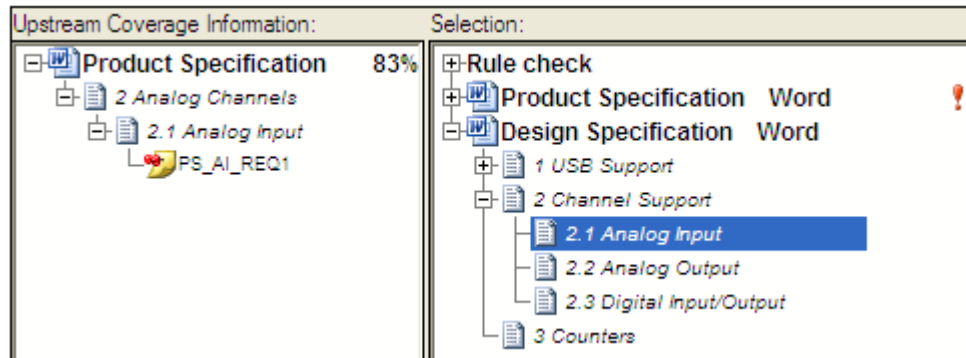
Complete the following steps to add a cover to the project that you created in the *Managing Requirements* chapter.

1. Expand the child elements of the `Product Specification` document in the **Selection** column of the **Coverage Analysis View**.
2. Fly over the exclamation icon, to the right of the `PS_USB_REQ2` requirement to display a tip strip that contains the text, **1 uncovered requirement**. The tree view pane displays the exclamation icon for an uncovered requirement and its parent elements in the document.
3. Click the `Analog Channels` section as shown in the following figure. The child elements of the `Analog Channels` section contain two requirements: `PS_AI_REQ1` and `PS_AO_REQ1`. The **Downstream Coverage Information** column displays both the 2.1 `Analog Input` and the 2.2 `Analog Output` sections as covering elements. In the covering document, the 2.1 `Analog Input` section contains a reference to the `PS_AI_REQ1` requirement and the 2.2 `Analog Output` section contains a reference to the `PS_AO_REQ1` requirement.

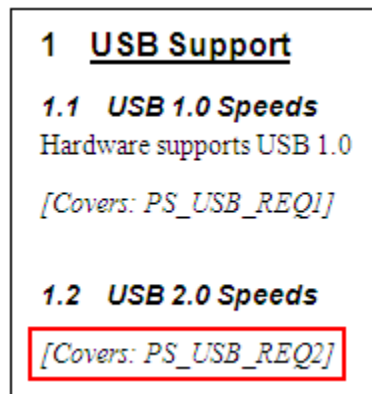


4. Double-click the 2.1 `Analog Input` section in the **Downstream Coverage Information** column. ReqTracer navigates to the 2.1 `Analog Input` section in the **Selection** column. The **Upstream Coverage Information** column displays that 83% of the requirements in the `Product Specification` document are covered by the `Design`

Specification document, and that the PS_AI_REQ1 requirement is specifically covered by references from the 2.1 Analog Input section in the **Selection** column.

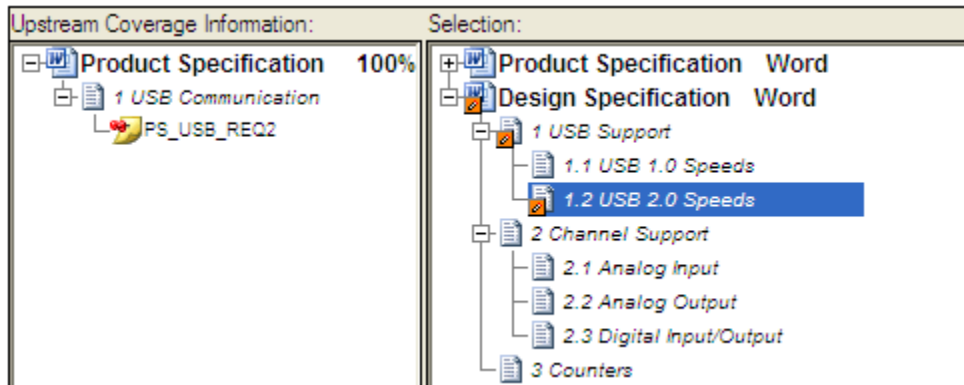


5. Expand the 1 USB Support element of the Design Specification document to view the 1.2 USB 2.0 Speeds element.
6. Double-click the 1.2 USB 2.0 Speeds element in the **Selection** column to open the CoveringSpec.doc file in Word.
7. Edit the file by adding a reference to the PS_AI_REQ2 requirement below the 1.2 USB 2.0 Speeds section as shown in the following figure.



8. Save the changes to the CoveringSpec.doc file.
9. Return to ReqTracer. When the main window of ReqTracer is displayed, the application prompts you indicating that the Design Specification document was modified. Click

Yes to reload the file. ReqTracer analyzes the new document and updates the view as shown in the following figure.



The **Upstream Coverage Information** column now indicates that the Design Specification covers 100% of the requirements in the Product Specification document, the PS_USB_REQ2 requirement is now shown as covered by the 1.2 USB 2.0 Speeds element, and the orange icon for the 1.2 USB 2.0 Speeds element and its parent elements indicate a change occurred.

In summary, the **Coverage Analysis View** allows you to select elements from a project document and displays requirement coverage one level upstream and one level downstream from the selected document.

In the next section, you will learn how to use the **Impact Analysis View**.

Using the Impact Analysis View

The **Impact Analysis View** displays traceability information from all downstream and upstream documents instead of only displaying the immediate downstream and upstream document. In this chapter, you will learn how to add a third document to the project and how to use the **Impact Analysis View**.

Modifying a Document

Complete the following steps to modify an existing document to the project that you created in the *Managing Requirements* chapter.

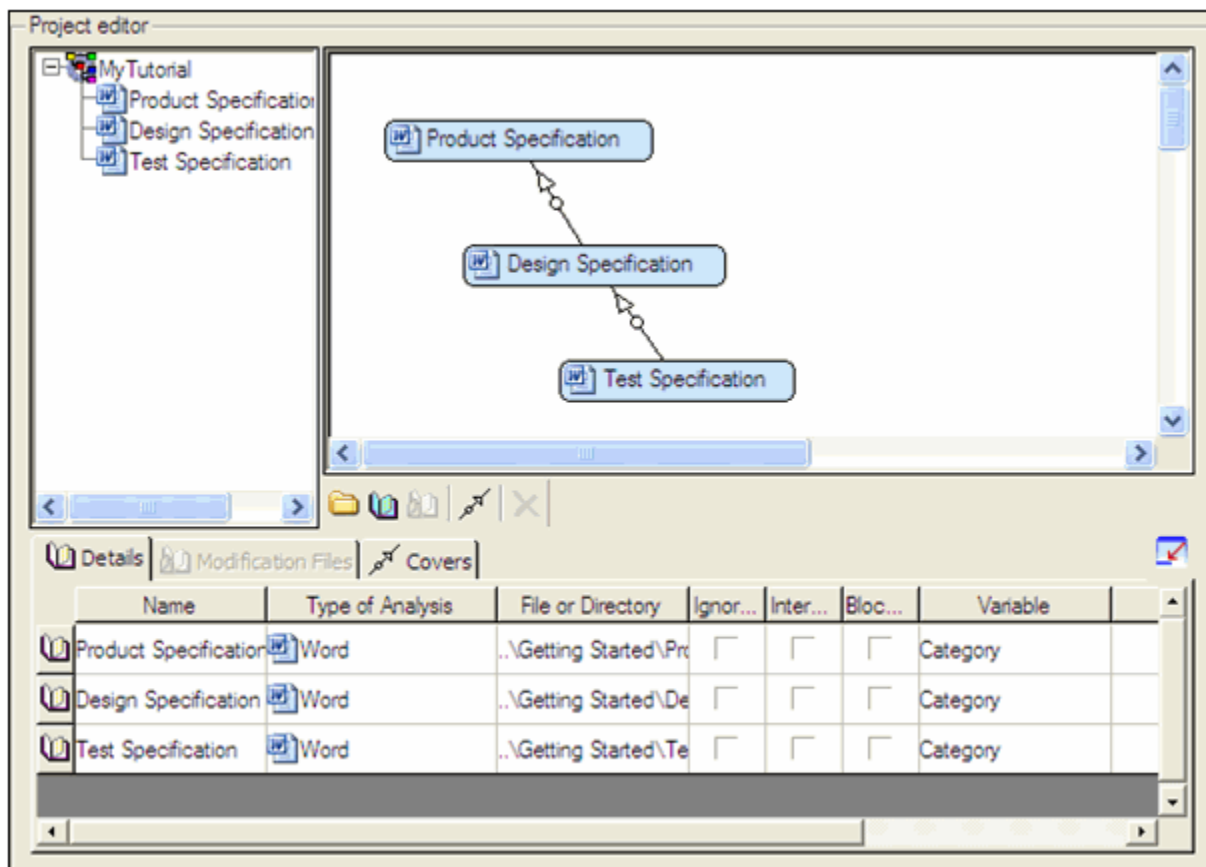
1. Select **File> Edit Project** to launch the **Project** pane of the Configuration dialog box.
2. Click the Design Specification object in the Traceability Description Area.
3. In the Document Details Area, reconfigure the document as follows:
 - o **Name** — Design Specification
 - o **Type of Analysis** — Word

- **File or Directory** — <ReqTracer>\examples\Use Cases\Getting Started\DesignSpec.doc

Adding a Second Downstream Document

Add a third document to the project.

1. From the **Project editor**, click the **Add a document** button to add a third document object in the Traceability Description Area. Place the document below the second document.
2. In the Document Details Area, configure the document as follows:
 - **Name** — Test Specification
 - **Type of Analysis** — Word
 - **File or Directory** — <ReqTracer>\examples\Use Cases \GettingStarted\TestSpec.doc
3. Click the **Add a cover** button to add a covering link. Click the Test Specification document object first and then click the Design Specification document object to create an arrow between the two documents, as shown in the following figure.



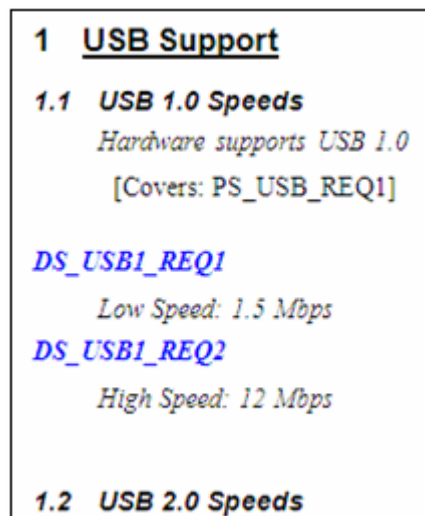
4. Click **OK** to save and close the Configuration dialog box. Click **Yes** when ReqTracer prompts you to reanalyze the project. Your new project is now properly configured to analyze the new documents.

Return to the ReqTracer main window and select the **Impact Analysis View** tab. Collapse the three document elements in the **Selection** column.

Reviewing the New Documents

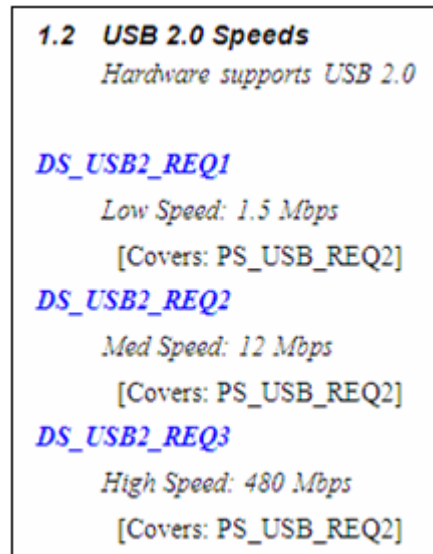
Complete the following steps to review the contents of the two new documents.

1. Double-click the `Design Specification` element in the **Selection** column to display the `DesignSpec.doc` file in Word.
2. Review the contents of the file in Word. The `DesignSpec.doc` file contains similar sections and text elements as found in the `CoveringSpec.doc` file, however the `DesignSpec.doc` file also contains 24 additional requirements. These additional requirements are covered by references in the `Test Specification` document. The following figure displays the `1.1 USB 1.0 Speeds` section of the file, which contains a reference to the `PS_USB_REQ1` requirement and contains two additional derived requirements, `DS_USB1_REQ1` and `DS_USB1_REQ2`. A **derived requirement** is a requirement that is defined in a document but is not directly associated with the coverage of an upstream document.



To associate a requirement with the coverage of an upstream document, the requirement must be specified immediately before the reference that covers the upstream document

as shown in the following figure. These requirements are sometimes referred to as **non-derived** or **low-level** or **design** requirements.



ReqTracer displays derived and non-derived requirements in the **Impact Analysis View**.

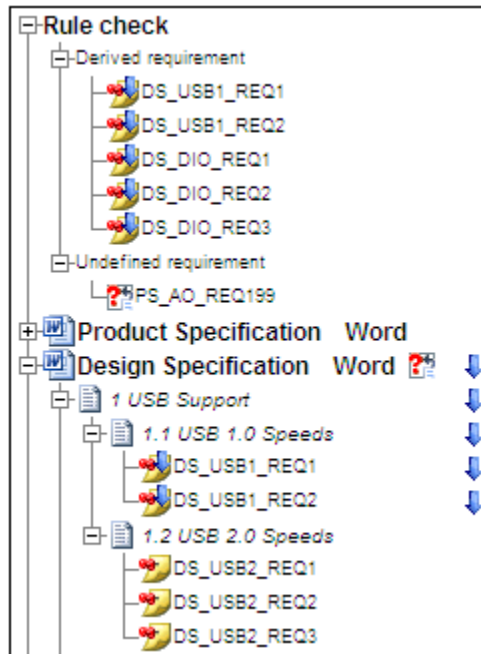
3. Double-click the `Test Specification` element in the **Selection** column to open the `TestSpec.doc` file in Word. Review the contents of the file in Word. The `TestSpec.doc` file contains references for 24 requirements specified in the `Design Specification` document.


Performing Impact Analysis

Complete the following steps to learn how to analyze the new documents using the **Impact Analysis View**.

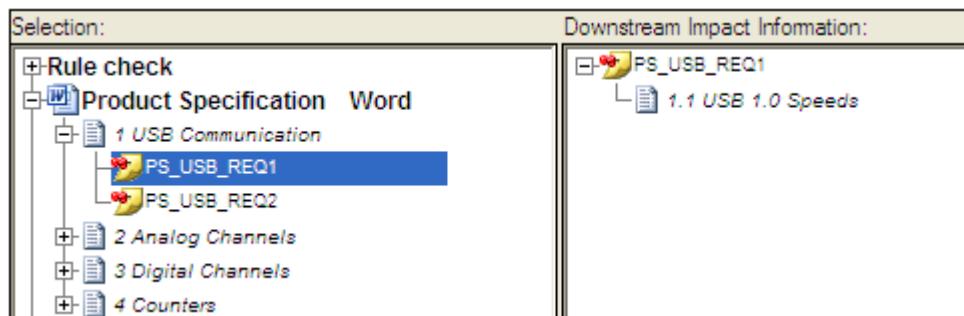
1. Expand the `Design Specification` document in the **Selection** column, as shown in the following figure, to display the derived requirements, `DS_USB1_REQ1` and `DS_USB1_REQ2`, and the non-derived requirements, `DS_USB2_REQ1`, `DS_USB2_REQ2` and `DS_USB2_REQ3`.

ReqTracer displays different icons for derived and non-derived requirements and displays a navigation arrow icon on the right side of the column to highlight derived requirements. Derived requirements are also added to the **Rule check** information.



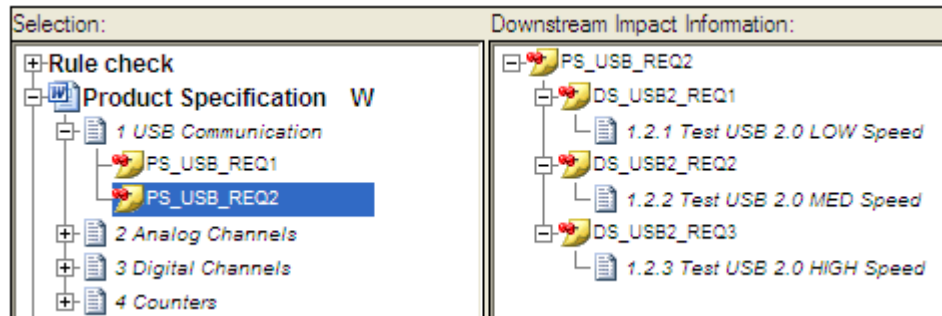
The icon  indicates that an error exists. In this example, the error is : "The target requirement of reference PS_AO_REQ199 has not been found anywhere in the project".

2. Expand the **Product Specification** document, as shown in the following figure, and select the **PS_USB_REQ1** requirement. The **Downstream Impact Information** column displays the covering 1.1 USB 1.0 Speeds section from the **Design Specification** document.



3. Select the **PS_USB_REQ2** requirement as shown in the following figure. The **Downstream Impact Information** column displays the non-derived requirements from

the covering Design Specification document. It also shows the sections from the Test Specification document that covers the non-derived requirements.

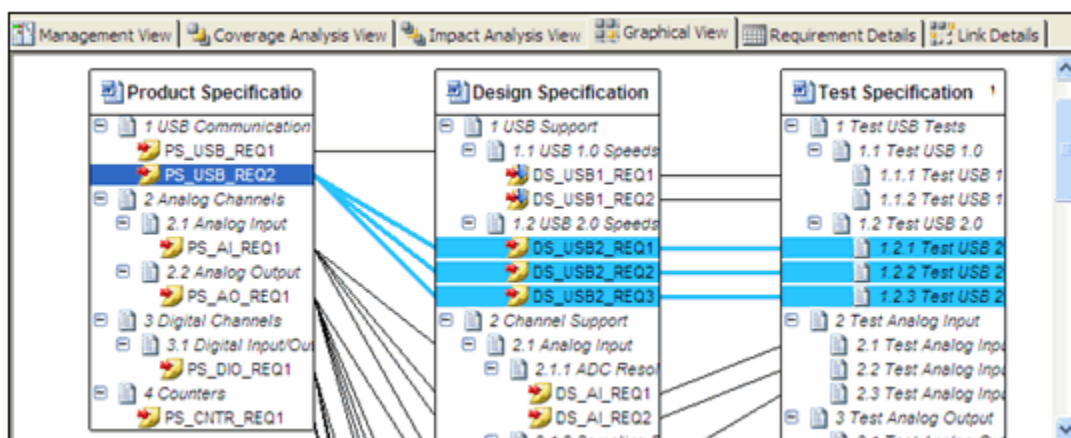


In the next section, you will learn how to graphically view traceability information.

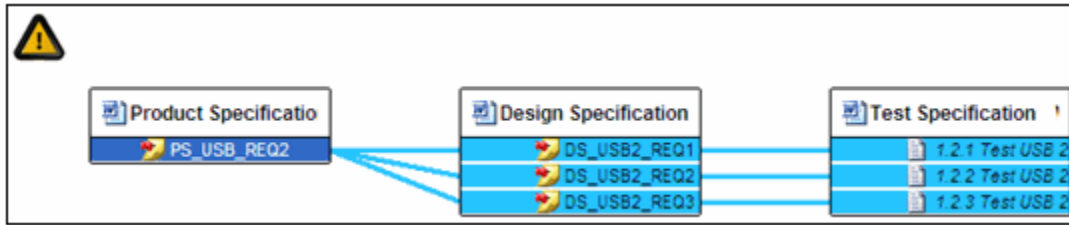
Using the Graphical View

Complete the following steps to graphically view your project documents.

1. Select the **Graphical View** tab. The **Graphical View** displays each document as an object with its traceability elements displayed in a tree view within the object. Thin, black lines represent covering references between requirements elements of a document and elements in another document. You can also reposition documents, adjust the width of the documents, pan, zoom and resize the containing page.
2. Click the PS_USB_REQ2 element in the Product Specification document. When you make this selection, the view highlights the PS_USB_REQ2 element, the covering DS_USB2_REQ1, DS_USB2_REQ2 and DS_USB2_REQ3 requirements, their coverage by Test Specification and the lines between the elements, as shown in the following figure.



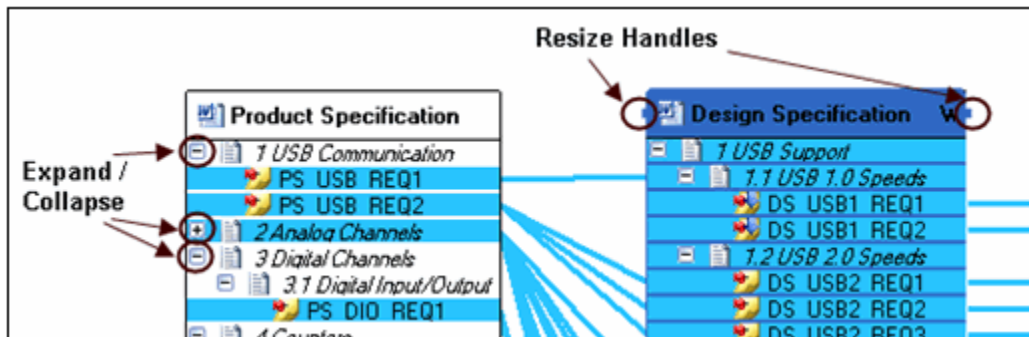
- Right-click the PS_USB_REQ2 requirement and select **View Graph for Selection** from the context menu. When you make this selection, the view only displays the highlighted elements from the three documents, as shown in the following figure.



- Right-click in the view and select **Show All Elements** from the context menu to show all the elements of the documents again.

Below are listed some actions to perform within the **Graphical View**.

- Click the header of the Test Specification document. When you make this selection, the entire document is selected.
- Right-click the Test Specification document and select **Hide Selected Documents** from the context menu. When you make this selection, the view hides the Test Specification document and displays the traceability information for the remaining two documents.
- Right-click in the view and select **Show Hidden Elements** in the context menu to display all the documents again. A dialog opens to select the document to show again.
- Move documents within the **Graphical View** by selecting the document header and dragging the header to a new location.
- Zoom in and out by pressing <Ctrl> while rolling your mouse wheel up or down. You can also select either **Zoom > 100%** or **Zoom > Fit in page** from the context menu.
- Resize the width of a document by selecting the document header and dragging the resize handles that appear on the right side of the document. Consult following figure.
- Expand and collapse the sections by clicking the plus sign. You can also right-click the header of a document and select **Collapse Root Sections** or **Expand All Sections** from the context menu, as shown in the following figure.



In the next chapter you will learn how to generate reports for a project.

Chapter 5

Generating Reports

In this chapter you will learn how to generate reports and create customized reports.

Generating a Built-in Report

ReqTracer installs the following **Library Reports**:

- **Traceability Matrix** — Lists the upstream to downstream covered links and the downstream to upstream covering links.
- **Analysis Results** — Summarizes the coverage analysis for a project.
- **Project Description** — Describes the project and its documents.
- **Upstream Impact Analysis** — Lists the upstream traceability information for selected elements of the project.
- **Downstream Impact Analysis** — Lists the downstream traceability information for selected elements of the project.
- **Synthesis of Added Information** — Summarizes any added attributes, references, text and covering links in the project.
- **Rules Checking** — Contains a summary of any rules highlighted by the project.

Complete the following steps to generate a **Project Description** report for your project.

1. Select **Reports > Library Reports > Project Description** to display the **Save As** dialog box.

2. Enter `ProjectDescription.rtf` in the filename control and click **Save**. ReqTracer generates and displays the report file in Microsoft WordPad or Microsoft Word, as shown in the following figure. Review the contents of the report.

<i>Project Description</i>	
1. General data	
Project: Tutorial	
Directory: <your project directory>	
Number of documents: 3	
Document types	Number of documents
Word	3
Number of requirements: 30	
Number of derived requirements: 5	
Number of uncovered requirements: 0	
2. Product Specification: Word	
3. Design Specification: Word	
Design Specification covers 100% of requirements of Product Specification	
Design Specification covers 1 undefined requirements	
Design Specification contains 5 derived requirements	
4. Tests Spec: Word	
Tests Spec covers 100% of requirements of Design Specification	

You have completed this tutorial. Refer to the *User Manual* for more detailed information about all the windows, features and concepts introduced here.

We started with a demo example that is very simple, but consistent with what you can experiment when you switch to a more complex process for requirements management:

- More advanced and more specific Types of analysis can be created using the *Customization Guide*. Those types can be used to analyze Word files, as well as information from other text processing tools, requirements management tools (DOORS, RequisitePro, etc.), modeling tools, verification tools, code files and so on. However, for users project there still exists ready-to-use types like the “Word” one used in this tutorial.
- More advanced processes can be defined, with a larger number of documents and more complex relationships, but you will have to use the same Project Editor window, and use the same feature to add new documents, new coverage links, etc.



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