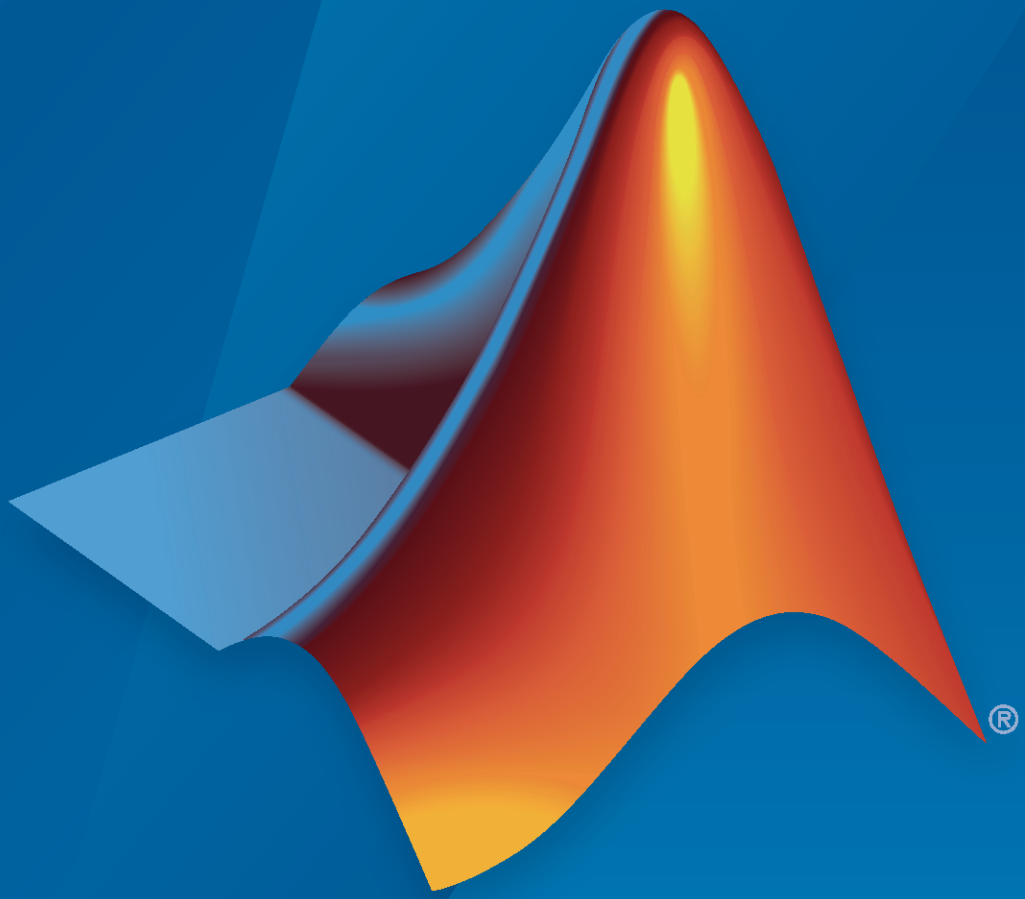
Simulink® Requirements™ Release Notes



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Simulink® Requirements™ Release Notes

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R2020a

Version: 1.5

New Features

Bug Fixes

Traceability Matrix: Review and analyze links in a matrix format

You can review and analyze requirements, links, and model entities by creating a traceability matrix. A traceability matrix summarizes traceability links and their sources and destinations, such as requirements, models, or test cases. You can:

- Identify missing or incorrect links.
- Create missing links.
- Fix incorrect links.
- Display requirements that are linked to model elements.
- Inspect links by navigating to their sources or destinations.
- Filter by requirement type, link type, or model hierarchy.
- Confirm model and requirement completeness.

To create a traceability matrix,

1. In the **Requirements** tab, select **Share > Open Requirements Traceability Matrix**.
2. Click **Add** to create a matrix.

For more information, see “Track Requirement Links with a Traceability Matrix”.

Include results from external sources in verification status

Requirements-based tests can run outside of the Simulink environment, such as using MATLAB® scripts or continuous integration servers, such as Jenkins™. You can include external test results in the requirements verification status by linking to scripts or results files. To include external results in requirements verification status:

1. Create a link type to your test script or result file. Use plugins for the format, such as `TAP`, `JUnit`, or Excel®.
2. Link from the requirement to the test script or result file.
3. View the verification status in the in the **Verified** column of the Requirements Editor and Requirements Browser.

For more information, see “Include Results from External Sources in Verification Status”.

View, link, and sync IBM Rational DOORS Next Generation requirements

You can now capture a requirements module or subset of requirements directly from IBM® Rational® DOORS® Next Generation (DNG). In Simulink Requirements, you can link these requirements to your model or MATLAB code, and refresh the requirement set if the source in DNG changes. You can capture requirements by specifying:

- A DNG module
- A DNG query

Capturing DNG items from a module or query enables you to directly use DNG requirements as a source, without intermediate ReqIF™ conversions. You can work with captured requirements without an active connection to the DNG server.

For an example, see the section **Capture DNG Collections into Simulink Requirements Set** in "Link with Requirements in DOORS Next Generation Project".

Link from ports in System Composer

You can link from requirements to ports in a System Composer™ architecture model.

User interface enhancements

- You can select multiple requirements and links in the Requirements Browser and Requirements Editor. You can link and delete multiple selected items.
- You can display a requirements description and rationale in the Requirements Browser.

Programmatic interface enhancements

- Determine links in a link set: You can return the links in a `LinkSet` using `getLinks`.
- Navigate to link source and destination: You can navigate to a `Link` source or destination using `slreq.show`.
- `slreq.find` has been re-implemented to improve performance when operating on large sets of requirements and links. For example, this command to find a single link in a set of approximately 1200 links runs approximately 2 orders of magnitude faster:

  ```
  function timingTest
      slreq.find('type','Link','SID',63)
  end
  ```

  The approximate execution times are:

  - R2019b: 1.09 `s`
  - R2020a: 0.01 `s`

  The code was timed on a Windows® 10, Intel® Core™ i7-8650U CPU @ 1.90 GHz system by calling the function `timingTest`.

R2019b

Version: 1.4

New Features

Bug Fixes

Contextual Tabs in the Simulink Toolstrip for Simulink Requirements

In R2019b, the Simulink Toolstrip replaces Simulink menu bar. See “Simulink Toolstrip: Access and discover Simulink capabilities when you need them” (Simulink) for more details. The location of several Simulink Requirements features and buttons are located in contextual tabs that appear when you need them.

1. Click on **Apps**.
2. Under **Verification, Validation, and Test**, you can open the **Requirements Manager** tab or the **Requirements Viewer** tab.

The **Requirements Manager** tab also appears when you open the Requirements Perspective.

Improved Requirements Exchange with ReqIF

You can import multiple source specifications from Requirements Interchange Format (ReqIF) files. When you import ReqIF files that contain multiple source specifications, you can choose to:

- Import only a single ReqIF source specification into a requirement set.
- Combine ReqIF source specifications into one requirement set. After importing, each specification corresponds to a node in the requirement set. You can update nodes independently if the content of the ReqIF file changes.
- Import each ReqIF source specification into a separate requirement set. You select a folder, and the import operation creates multiple requirement set files in that folder.

Also, import supports exchange links in ReqIF files, which are represented in link sets.

For more information, see Import Requirements from ReqIF Files.

Navigation Support for Baselines in IBM Rational DOORS 9

You can now link requirements to a baseline version of a DOORS 9 module. A baseline version remains consistent if the most recent DOORS 9 module changes. If your model or code reflects baseline requirements, link to the baseline DOORS 9 version.

Set the baseline version using `slreq.cmConfigureVersion`, and query the active baseline version using `slreq.cmGetVersion`.

Enhanced Web View Reports for Reviewing Requirements and Links

With Simulink Report Generator™, you can generate a Simulink Web View of your model that now includes requirements and requirements property information. In the Simulink model, open the Requirements Perspective. In the **Requirements** tab, click **Share > Export Model to Web View**.

For more information on Simulink Web Views, see Web Views (Simulink Report Generator).

Programmatically Modify Link Source and Destination

In R2019b, you can use the new `setSource` and `setDestination` methods to modify link source and destination targets.

External Source Document Change Notification

If you have requirement references to external source documents, the Requirements Editor now notifies you of updates to the source documents. If a source document has changed since the most recent import or update operation:

- The top import node displays a notification icon.
- The **Data Exchange** pane displays a status message.

For more information, see Update Imported Requirements.

R2019a

Version: 1.3

New Features

Bug Fixes

Round Trip Workflow with Requirements Tools: Exchange requirements with third-party requirements tools through ReqIF

Simulink Requirements now supports round trip importing and exporting using the open standard ReqIF (Requirements Interchange Format) file format. The round trip workflow can be broadly subdivided into three categories:

- **Import**: Use attribute mappings to define how the attributes of a requirement in Simulink Requirements relate to the attributes of an external requirement represented by a different third-party requirements management application. When you import requirements from a ReqIF file, Simulink Requirements detects the source tool for the ReqIF file and applies a pre-configured attribute mapping. You can also customize and save attribute mapping templates.
- **Edit**: Provide supplementary information to imported requirements by adding custom attributes and editing requirements content.
- **Export**: Export locally authored requirements and referenced requirements with local edits and additional attributes to ReqIF files.

For more information, see Round Trip Workflows with ReqIF Files.

Navigation Backlinks for Third-Party Requirements: Manage backlinks in external requirement documents that enable you to navigate to Simulink model elements

When you work with requirements from an external requirements document, you can insert, delete, and modify navigation backlinks in the external requirements document that match the set of links stored by Simulink Requirements. Use these navigation backlinks to navigate from the external document to Simulink and MATLAB artifacts. For more information, see Manage Navigation Backlinks in External Requirements Documents.

Integration with System Composer: Link requirements to architecture models in System Composer

Link and trace requirements to architecture components in System Composer models.

Usability Enhancements

- Reorder requirements in the Requirements Spreadsheet by using drag-and-drop functionality.
- Link requirements to area annotations on the Simulink Editor by dragging and dropping. A badge appears on the annotation to show that a link was created. Click the badge and click **Show** to display a requirement annotation on the Simulink Editor.
- All link sets on the MATLABor project path with incoming links to a requirement set are loaded automatically when you load the source and destination artifacts. When you close all source and destination artifacts related to loaded link sets, the link sets are unloaded when no requirements reference any of the links in the link sets. For more information, see Review Requirement Links.
- Simulink Requirements now uses short names on the MATLAB path as the default path setting in the **Document file reference** option on the **Selection Linking** tab of the Requirements Settings dialog box.

- Starting from R2019a, MATLAB uses HTTPS as the default connection protocol. HTTP connections are disabled by default. Run `rmi('httpLink')` at the MATLAB command prompt to enable HTTP to navigate from third-party tools and web reports to artifacts in Simulink Requirements.

Simulink Requirements contextual tab in the Simulink Toolstrip

In R2019a, you have the option to turn on the Simulink Toolstrip. For more information, see Simulink Toolstrip Tech Preview replaces menus and toolbars in the Simulink Desktop (Simulink).

The Simulink Toolstrip includes contextual tabs — they appear only when you need them. The Simulink Requirements contextual tabs include options for completing actions that apply only to Simulink Requirements.

- Access the **Requirements Manager** tab by entering the Requirements Perspective View.
- Access the **Requirements Viewer** tab from the **Apps** tab on the Simulink Toolstrip.

Code Traceability: Include outgoing traceability links from external MATLAB code referenced by MATLAB Function Blocks in code generation report

The code generation report from Embedded Coder® now includes requirement traceability links for MATLAB files saved externally from the Simulink model and referenced from MATLAB Function blocks in Simulink. For more information, see Traceability Links in Code Generation Reports.

Report Generation Enhancements: Include change information in requirements report

You can include requirements and links change information in the generated requirements report. All change issues are summarized in a table in the Requirements Report Appendix.

R2018b

Version: 1.2

New Features

Bug Fixes

External Rich Text Editor: Use text editing and formatting features of Microsoft Word to author and edit rich text requirements

To edit rich text content in the **Description** and **Rationale** fields of your requirements, open Microsoft® Word from within the Requirements Editor or the Requirements Perspective View. You can:

- Spell-check requirements content.
- Resize images.
- Insert and edit equations.
- Insert and edit tables.

For more information, see Author and Edit Requirements Content by Using Microsoft Word.

Configurable Requirement and Link Types: Define custom requirement and link types for improved classification and analysis

With Simulink Requirements, you can now classify requirements by type. Define your own custom requirement types or use these types:

- **Functional:** Classify requirements that are meant to be implemented or verified in your Model-Based Design workflow. Functional requirements contribute to the Implementation and Verification status metrics of the requirement set that they are in.
- **Container:** Group requirements. Container requirements themselves do not contribute to the Implementation and Verification status metrics of the requirement set that they are in. However, all the Functional requirements under a Container requirement contribute to the status metrics.
- **Informational:** Provide supplemental information. Informational requirements and all requirements under them do not contribute to the Implementation and Verification status metrics of the requirement set that they are in.

You can also define custom requirement and link types by using the `sl_customization.m` file. See Define Custom Requirement and Link Types.

Incoming Link Resolution: Automatically load and display incoming links when opening artifacts stored in Simulink Projects

When you work with requirements sets in Simulink Projects, all the link sets related to your requirements sets are loaded automatically when you load the source and destination artifacts. When you close all source and destination artifacts related to loaded link sets, the link sets are automatically unloaded when no requirements reference any of the links in the link sets. For more information, see Manage Requirements Across a Team.

IBM Rational DOORS Next Generation Integration: Establish traceability to requirements stored in DOORS Next Generation project areas with configuration management enabled

If you are working with IBM Rational DOORS Next Generation projects that have configuration management enabled, you can create links from Simulink model elements to requirements stored in

streams or changesets. View link summaries and batch redirect existing links from a stream or a changeset in an IBM Rational DOORS Next Generation project to another stream or changeset in the same project. For more information, see Requirements Traceability with IBM Rational DOORS Next Generation.

Extended Requirements Management Capabilities: Organize, view and manage requirements content with improved indexing and updating of imported requirements content

You can now update requirements imported from Microsoft Excel spreadsheets with non-unique **Custom Id** fields. When you work with the Requirements Editor or in the Requirements Perspective view, your window settings are saved across sessions. The saved settings are:

- Displayed columns (Requirements and Links view)
- Item sort order
- Current view (Requirements or Links view)

For more information on view settings, see View or Hide Columns in the Requirements Editor.

R2018a

Version: 1.1

New Features

Bug Fixes

Requirements Import with ReqIF: Import requirements information from third-party tools supporting the ReqIF standard such as IBM Rational DOORS Next Generation or Siemens Polarion

Use the Document Import Wizard to import and work with requirements from third-party tools supporting the Requirements Interchange Format (ReqIF) file format. For more information, see Import Requirements from ReqIF Files.

IBM Rational DOORS Import Wizard: Work with and manage requirements from DOORS by importing them as read-only references

Use the Document Import Wizard to import and work with requirements from IBM Rational DOORS from within Simulink Requirements. For more information, see Import Requirements from IBM Rational DOORS.

Batch Test Execution: Verify requirements by launching linked tests

If you have Simulink Test™ test cases or Simulink Design Verifier™ Proof Objective blocks linked to requirements, you can run tests from the Requirements Editor. Right-click the requirement node and select **Run Tests**. In the dialog box, select the tests to run. The Verification Status metric updates after the tests complete. For more information, see Review Requirement Verification Status Metrics Data.

Link Set Comparison: Track changes to requirements links by comparing Link Set files

Use the Link Set Comparison tool to compare link set files in your project and track changes to requirements links. For more information, see Track Changes to Requirements Links.

Simulink and Stateflow Annotation Conversion: Convert existing annotations to requirements to improve traceability, analysis, and management

Convert annotations in your Simulink models and Stateflow® charts to requirement objects that you can manage from within Simulink Requirements. For more information, see Convert Simulink Annotations to Requirements.

Test Harness Support: Work with Simulink Test test harnesses from the requirements perspective

You can now enter and work with Simulink Test test harnesses from within the requirements perspective.

Requirements Report Generation: Generate requirements reports in PDF and HTML formats

You can now generate requirements reports in PDF and HTML formats. For more information, see Report Requirements Information.

R2017b

Version: 1.0

New Features

Introduction to Simulink Requirements: Author, analyze, and manage requirements

With Simulink Requirements, you can author and manage requirements within Simulink. Create requirement sets, organize requirements in hierarchies, and link requirements to model entities, tests, or other requirements. You can author requirements in the Simulink Editor or the Requirements Editor. You can also import requirements from external Microsoft Word or Microsoft Excel documents.

Quickly create implementation-type links by dragging requirements from the Requirements Browser to your model. Annotate your model diagrams with requirements information and navigate to the source requirement. Trace requirements to associated model entities and tests. To help you quantify completeness of your development activities in Model-Based Design, summarize implemented and verified requirements in your set and include this information in a report. For more information, see Getting Started with Simulink Requirements.

Requirements Editor and Browser: Author, edit, and organize requirements within Simulink

You can author, edit, and organize requirements within Simulink from the Requirements Editor or the Requirements Browser in the Simulink Editor. Describe requirements with rich text and images, and organize requirements in hierarchies. The requirements view displays the hierarchy and the detailed information for each requirement. The links view displays the source, destination, and type of relationship. To perform impact analysis for your requirements, use the links view. For more information, see Author Requirements in Simulink.

Requirements Import Wizard: Import requirements content from Microsoft Word and Microsoft Excel documents

You can import requirements stored in external Microsoft Word and Microsoft Excel documents into Simulink Requirements. You can import requirements in two ways:

- As editable requirements objects, in which you make subsequent updates by using Simulink Requirements.
- As read-only requirements objects that reference the external document, in which you use Word or Excel to update your requirements. You can navigate to the external document content from a requirement object.

For more information, see Import Requirements from Third-Party Tools.

Requirements Perspective: Establish requirements – design traceability and annotate your model with requirements information in the Simulink Editor

With a new requirements user interface in the Simulink Editor, you can:

- Create links by dragging requirements to model entities.
- Annotate your model block diagram with requirements information.
- Show and hide requirements information associated with your model.

- Understand traceability gaps by identifying blocks without requirements badges.

To enable the Requirements Perspective, click the icon in the lower right of the Simulink canvas, and then click the Requirements graphic. For more information, see Author Requirements in Simulink.

Requirements Change Tracking and Comparison: Automatically identify and manage changing requirements and impacts on design, models, and tests

The Requirements Editor highlights changes to requirements or links in your requirement set. You can use this information to assess potential impacts to your design, and take appropriate action. Changes to the requirement set appear in the **Change Information** section of the Requirements Editor. If a requirement change impacts your model or tests, update the related model element to meet the modified requirement. If an issue has no impact, you can clear the issue to reflect the latest revision of the requirement. For more information, see Track Changes to Requirements Links.

Implementation and Verification Status Summary: Review implementation and verification status metrics for your requirements

The Requirements Editor summarizes your requirement set implementation links in the **Implementation status** column. For a particular requirement, implementation status shows whether the requirement has an implementation link. For a parent requirement or requirement set, implementation status aggregates the implementation metrics for child requirements. For more information, see Review Requirement Implementation Status Metrics Data.

The Requirements Editor also summarizes the results of verification type links in the **Verification status** column. With a Simulink Test license, verification status summarizes the results of linked test cases. With a Simulink Design Verifier license, verification status summarizes the results of linked proof objectives. For more information, see Review Requirement Verification Status Metrics Data.

Requirements Reporting: Archive and document your requirements traceability, implementation status, and change history

From the Requirements Editor, you can generate a detailed report of your requirement set and links. You can include detail such as requirement description, rationale, implementation status, verification status, and revision history. Reports use Microsoft Word format. For more information, see Report Requirements Information.

Simulink Verification and Validation Packaging: Moved Requirements Management Interface (RMI) features from Simulink Verification and Validation to Simulink Requirements

Linking and management features that use the Requirements Management Interface from Simulink Verification and Validation™ are now included in Simulink Requirements. You can update your RMI links to use the Simulink Requirements interface. For an example, see Migrating Requirements Management Interface Data to Simulink® Requirements™.