

# Simulink Verification and Validation Product Update

September 2017

**R2017b**

# New! Simulink Requirements

## Work with requirements and design together

- Author, edit, and organize requirements

The screenshot displays the Simulink Requirements Perspective interface. The main workspace shows a requirement diagram with several requirements and their relationships. Two requirements are highlighted with callouts:

- #7: Cancel Switch Detection**: If Cancel switch is pressed, it should be recognized. This requirement is implemented by the `reqMode Cancel` block.
- #8: Avoid repeating commands**: If the following switch operations are repeated, it should send NoRequest at 2nd time and after as long as the same switch is enabled:
  - Cancel
  - Cruise
  - Set
  - Resume
 This requirement is implemented by the `doNot Repeat` block.

The bottom panel shows the Requirements table for the project:

ID	Summary	Implemented	Verified
#1	Driver Switch Request Handling	Yes	Yes
#2	Switch precedence	Yes	Yes
#3	Avoid repeating commands	Yes	Yes
#4	Long Switch recognition	Yes	Yes
#5	Waiting state for Long Increment switch detection	Yes	Yes
#6	Waiting state for Long Decrement switch detection	Yes	Yes
#7	Cancel Switch Detection	Yes	Yes
#8	Set Switch Detection	Yes	Yes
#9	Enable Switch Detection	Yes	Yes
#10	Resume Switch Detection	Yes	Yes
#11	Transmitter Switch Detection	Yes	Yes

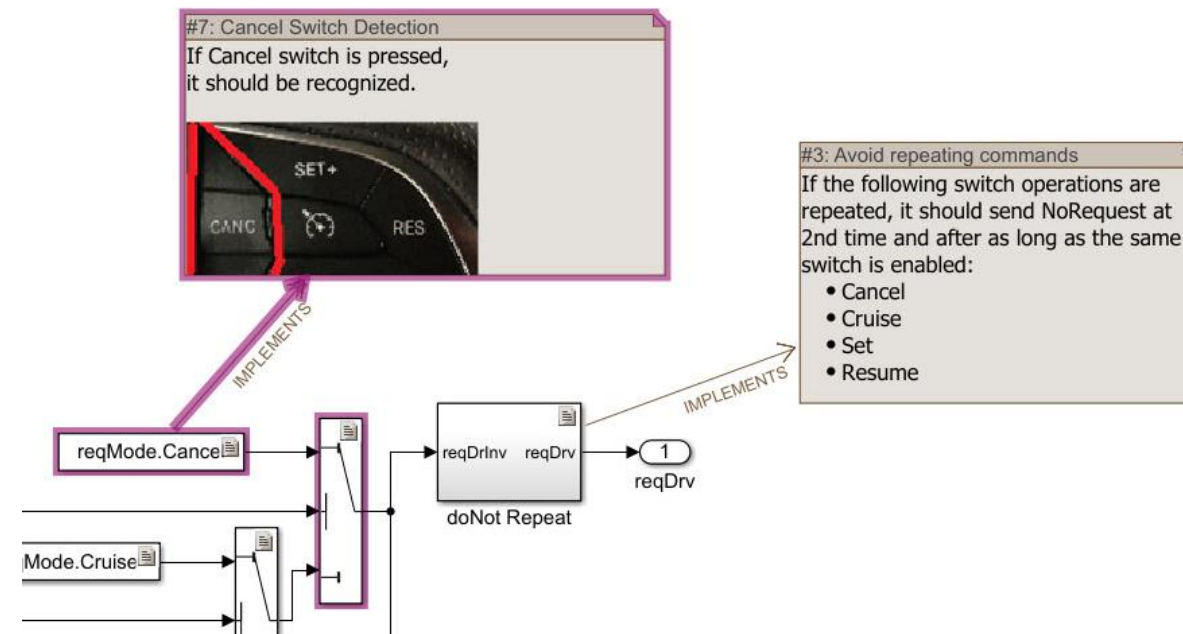
The right-hand pane shows the Properties Inspector for Requirement #7, including its description, rationale, and links to other requirements.

### Requirements Perspective

# New! Simulink Requirements

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- Author, edit, and organize requirements
- View and link requirements within the Simulink graphical editor



Requirement Badges and Annotations on Diagram

## New! Simulink Requirements

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- Track status and manage requirement changes

Index	Summary	Implemented	Verified
crs_req_func_spec	-	<div style="width: 100%; height: 10px; background-color: blue;"></div>	<div style="width: 10%; height: 10px; background-color: green;"></div>
1	Driver Switch Request Handling	<div style="width: 100%; height: 10px; background-color: blue;"></div>	<div style="width: 10%; height: 10px; background-color: green;"></div>
1.1	Switch precedence	Implemented: 16, Justified: 0, Total: 19	
1.2	Avoid repeating commands	<div style="width: 100%; height: 10px; background-color: blue;"></div>	
1.3	Long Switch recognition	<div style="width: 80%; height: 10px; background-color: blue;"></div>	
1.4	Cancel Switch Detection	<div style="width: 100%; height: 10px; background-color: blue;"></div>	<div style="width: 100%; height: 10px; background-color: red;"></div>
1.5	Set Switch Detection	<div style="width: 100%; height: 10px; background-color: blue;"></div>	
1.6	Enable Switch Detection	<div style="width: 100%; height: 10px; background-color: blue;"></div>	<div style="width: 100%; height: 10px; background-color: green;"></div>
1.7	Resume Switch Detection	<div style="width: 100%; height: 10px; background-color: blue;"></div>	
1.8	Increment Switch Detection	<div style="width: 80%; height: 10px; background-color: blue;"></div>	<div style="width: 40%; height: 10px; background-color: green;"></div>
1.8.1	Increment Short Switch Detection	<div style="width: 100%; height: 10px; background-color: blue;"></div>	<div style="width: 100%; height: 10px; background-color: green;"></div>
1.8.2			

**Implementation and Verification Status**

Source	Destination	Change Information	
Changed source: 3/12	Changed destination: 4/12	Source: Revision: 1 (Time Stamp: 25-Jul-2017 11:34:04)	
Enabling cruise control	#9 Enable Switch Detection	Issue: Destination Changed.	
Disabling cruise control	#7 Cancel Switch Detection	Stored: Revision: 15 (Time Stamp: 20-May-2017)	Actual: Revision: 18 (Time Stamp: 20-May-2017)
Activating cruise control	#8 Set Switch Detection	<input type="button" value="Clear Issue"/>	
Deactivating cruise control	#8 Set Switch Detection		
Target Speed Increment	#11 Increment Switch Detection		
Target speed decrement	#15 Decrement Switch Detection		
Target speed decrement	#16 Decrement Short Switch Detection		
Target Speed Increment	#12 Increment Short Switch Detection		
Successive Target Speed Increment	#13 Increment Long Switch Detection		
Successive Target Speed Increment	#14 Intermediate state		
Successive Target Speed Decrement	#17 Decrement Long Switch Detection		
Successive Target Speed Decrement	#18 Intermediate state		

**Notification of Requirement Changes**

## New! Simulink Requirements

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- Trace requirements to models, generated code, and test cases

**Generated Code**

```

123
124 /* Switch: '<S2>/Switch' incorporates:
125  * Constant: '<S74>/Constant'
126  * Constant: '<S83>/Constant'
127  * Constant: '<S84>/Constant'
128  * Constant: '<S95>/Constant'
129  * Constant: '<S96>/Constant'
  
```

**Links**

- Implemented by:
  - Switch
  - Enumerated Constant
- Verified by:
  - Cancel button
- Derived from:
  - Disabling cruise control

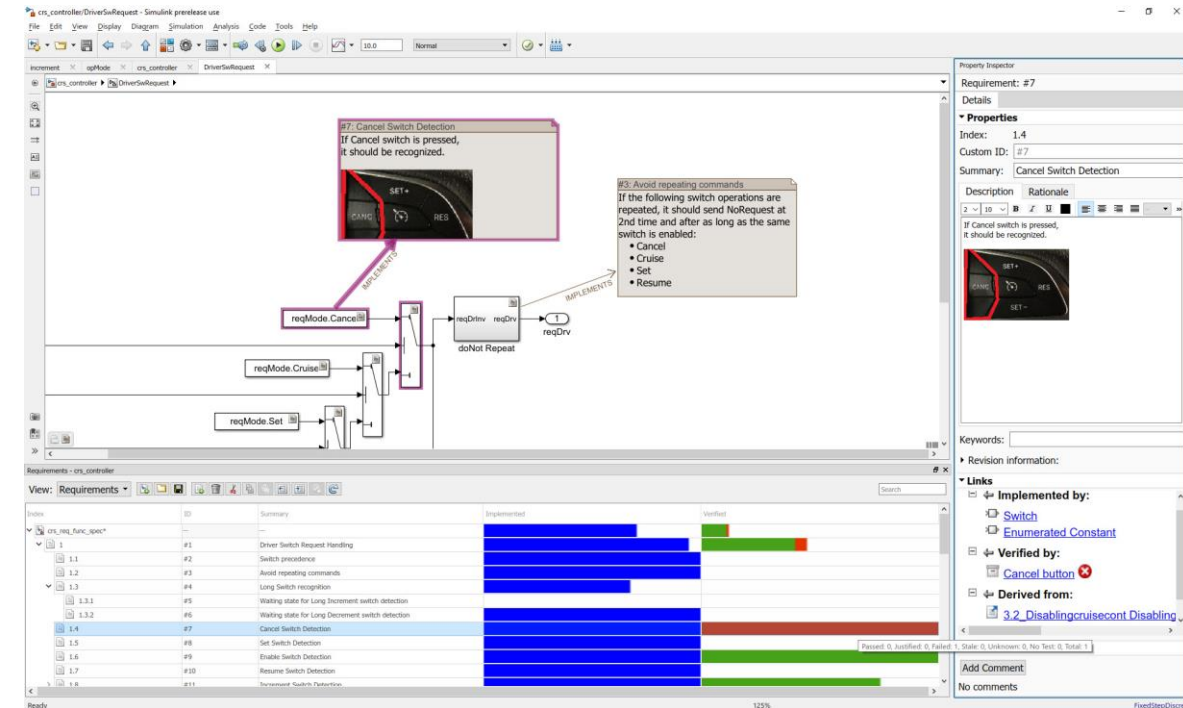
**Tests and Test Results**

NAME	STATUS
Results: 2017-Aug-01 18:08:34	7 <span style="color: green;">✔</span> 1 <span style="color: red;">✘</span>
Unit test for DriverSwRequest	7 <span style="color: green;">✔</span> 1 <span style="color: red;">✘</span>
Enable button	<span style="color: green;">✔</span>
Cancel button	<span style="color: red;">✘</span>
Set button	<span style="color: green;">✔</span>
Resume button	<span style="color: green;">✔</span>
Increment button short	<span style="color: green;">✔</span>

# New! Simulink Requirements

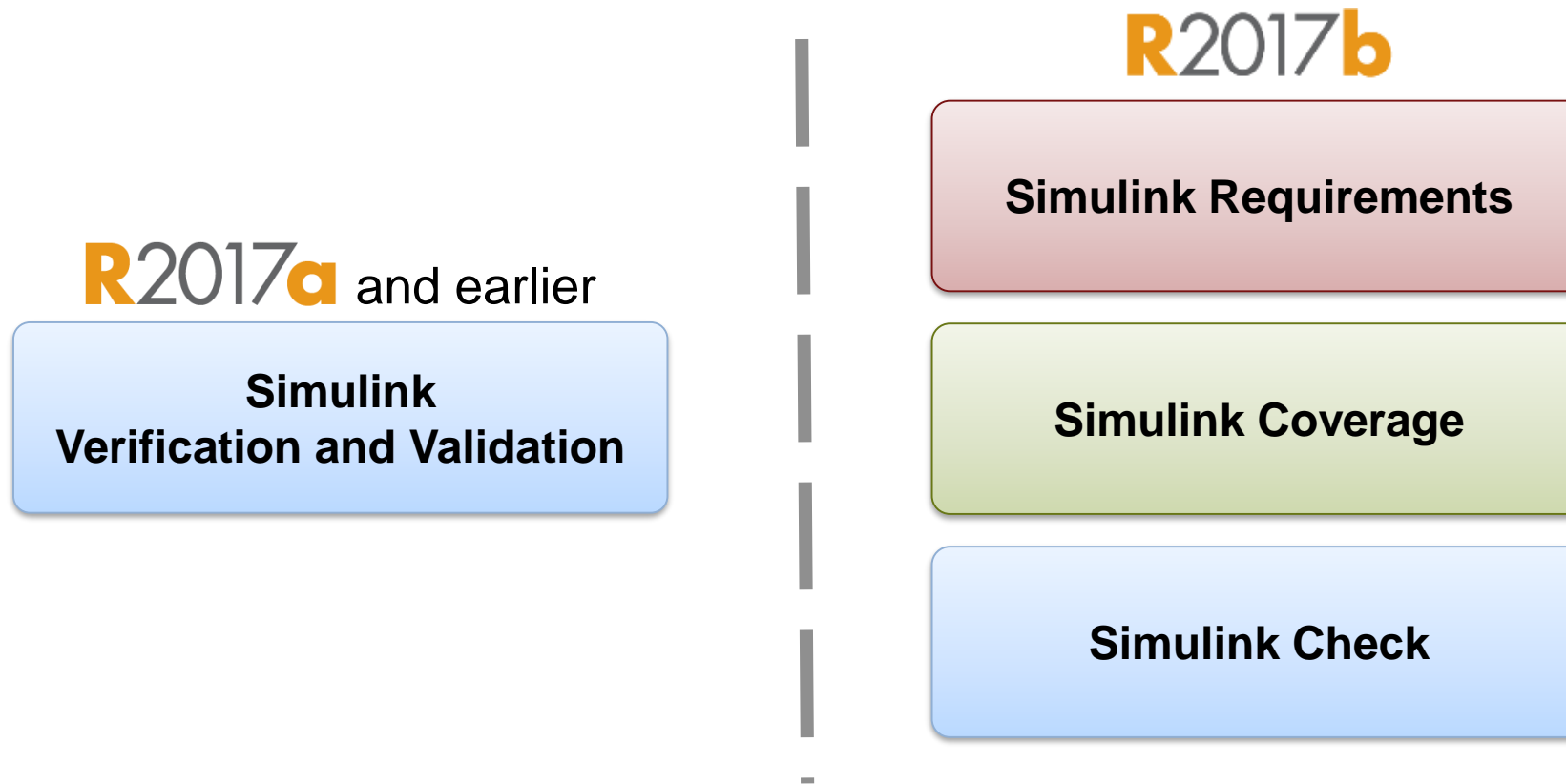
## Work with requirements and design together

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Requirements Perspective

# New Verification and Validation Products

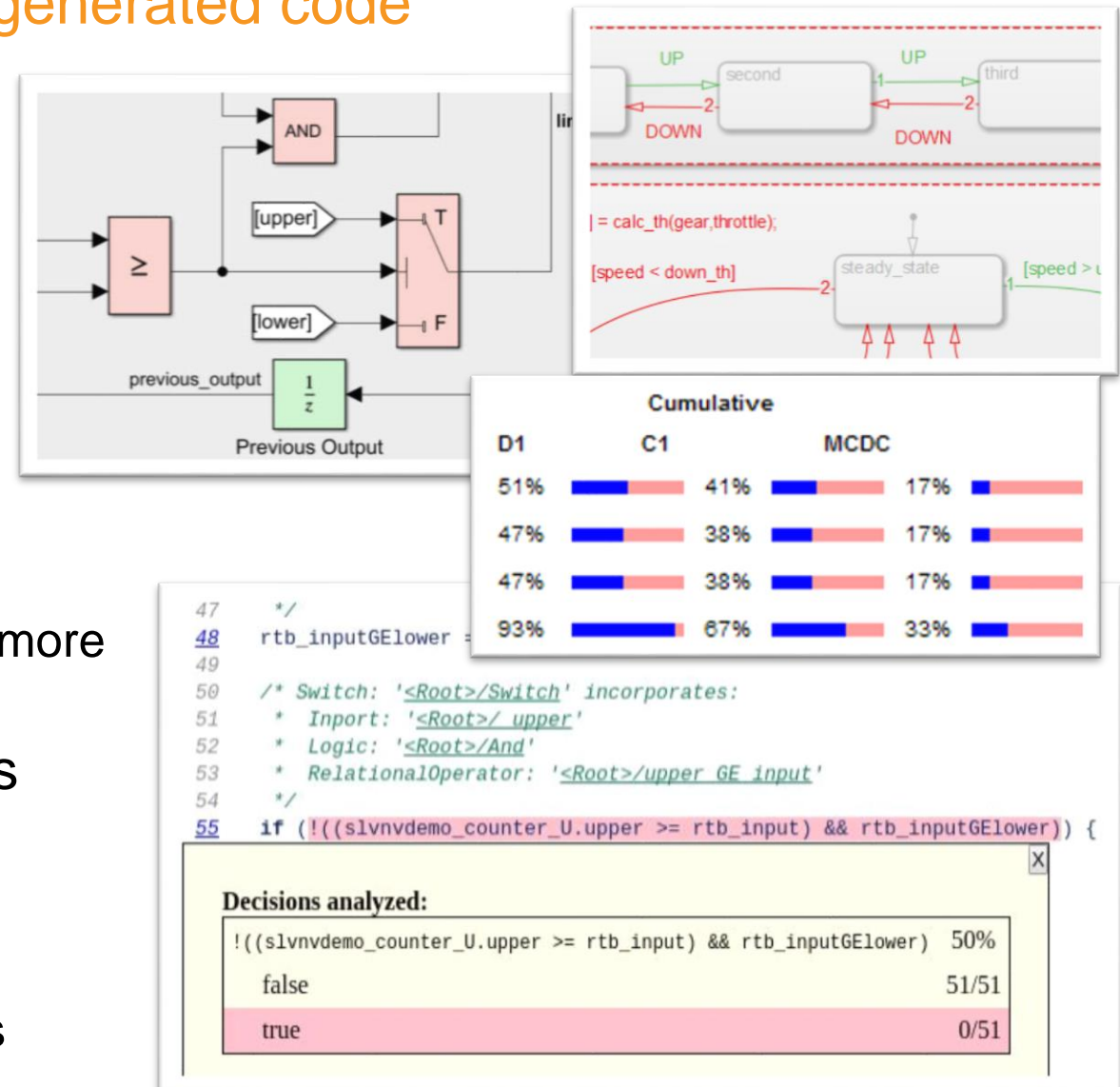


- Simulink Requirements – requirements authoring, editing, trace, management
- Simulink Coverage – model and code coverage analysis
- Simulink Check – static checking, metrics, clone detection

# Simulink Coverage

## Measure test coverage in models and generated code

- Model coverage analysis
  - Including C/C++ S-functions
- Generated code coverage analysis
  - C/C++ generated by Embedded Coder
- Comprehensive coverage metrics
  - Decision, condition, MC/DC, relational boundary, signal range, function call, and more
- Model highlighting and coverage reports
  - Locate where test coverage is missing
- Tool qualification support
  - DO Qualification and IEC Certification Kits

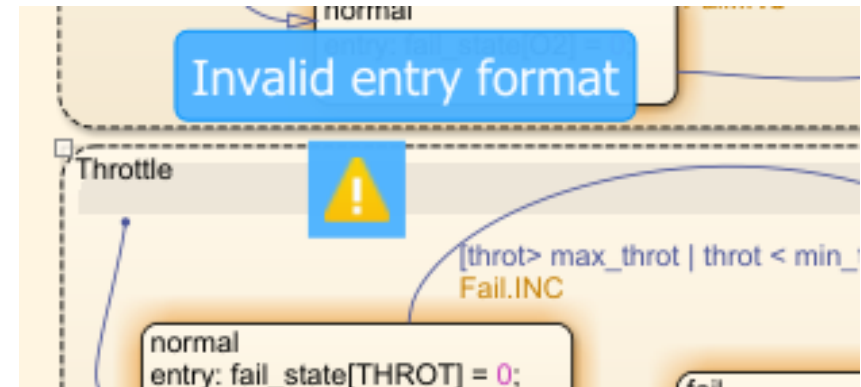




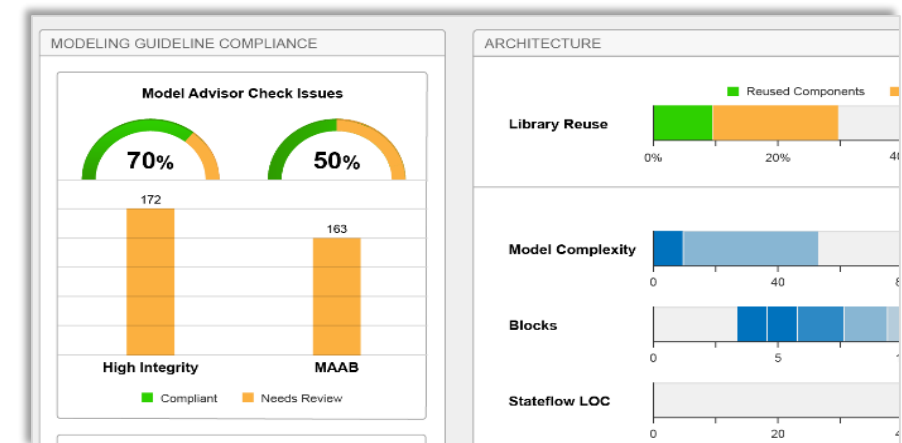
# Simulink Check

## Verify compliance with guidelines and standards

- Compliance checking for industry and security standards
  - DO-178, ISO 26262, IEC 61508, IEC 62304, MAAB, MISRA
  - Security: CERT C, CWE, ISO/IEC TS 17961
- Edit-time checking to fix violations earlier
- Metrics dashboard to assess design quality
- Refactoring of model clones and model transformations
- Tool qualification support with DO Qualification and IEC Certification Kits

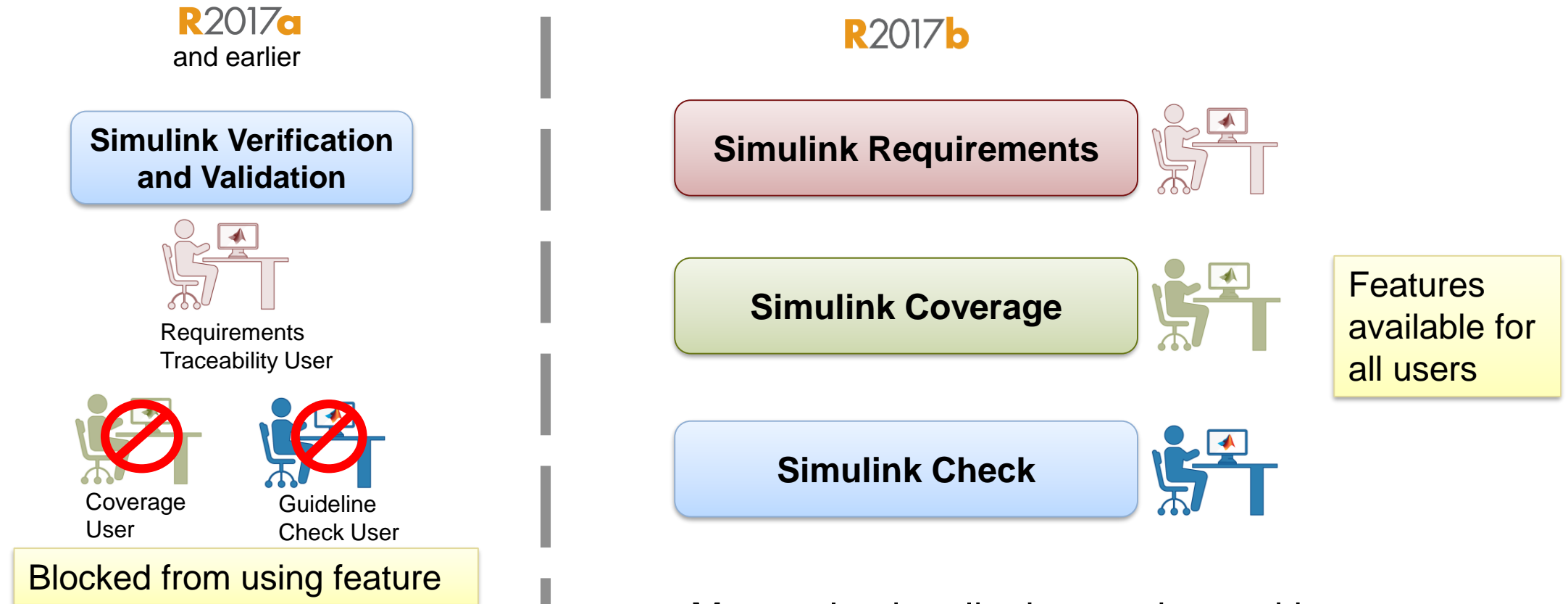


**Edit-Time Checks**



**Metrics Dashboard**

# Flexibility to Align Products Based on Usage



- More value by aligning products with usage
- Easier to understand focus of products

# License Information for Existing Users

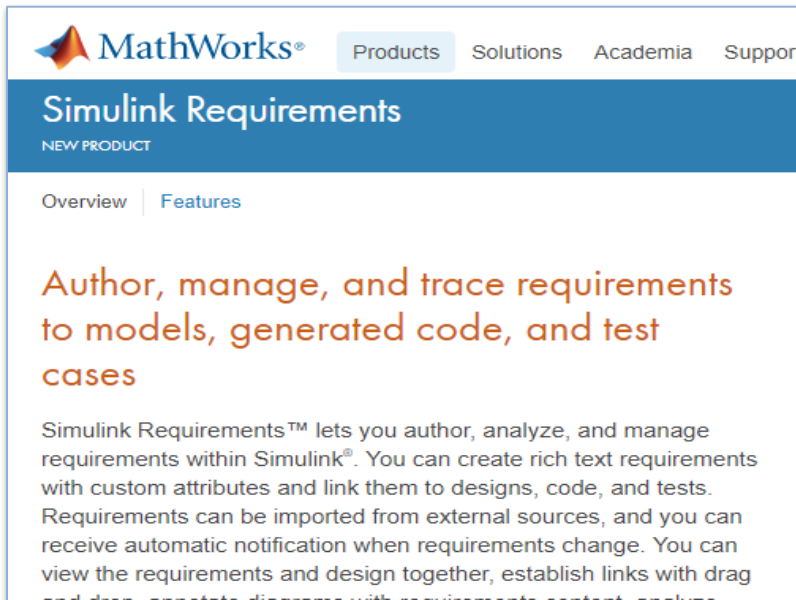
Effective as of R2017b

- Licenses of Simulink Verification and Validation automatically updated at no initial cost with:
  - Simulink Requirements
  - Simulink Coverage
  - Simulink Check
  
- New products each require MATLAB and Simulink
  - No dependencies on each other
  
- Simulink Design Verifier requires *Simulink Check* and *Simulink Coverage*
  
- Simulink Check provides license key for usage of R2017a or earlier releases

# Learn More - New Product Web Pages

[mathworks.com/products](https://mathworks.com/products)

## [Simulink Requirements](#)



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### Simulink Requirements

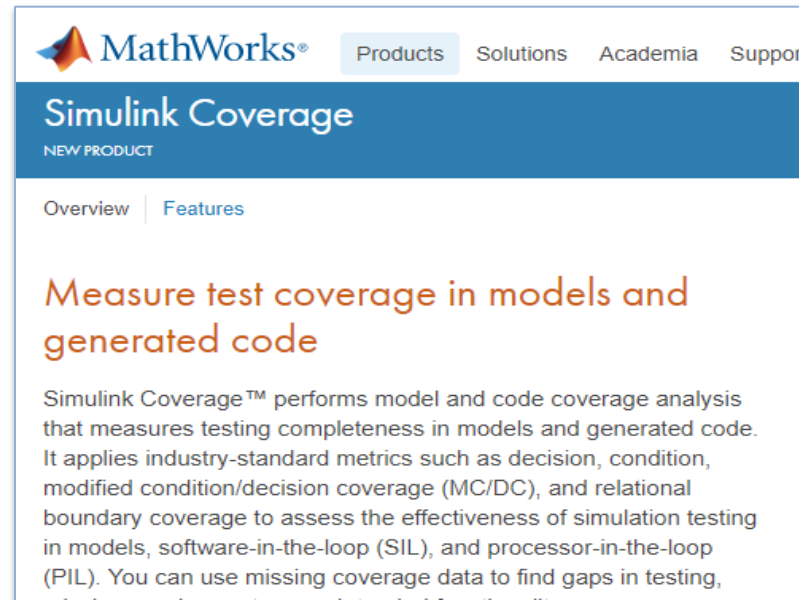
NEW PRODUCT

Overview | Features

**Author, manage, and trace requirements to models, generated code, and test cases**

Simulink Requirements™ lets you author, analyze, and manage requirements within Simulink®. You can create rich text requirements with custom attributes and link them to designs, code, and tests. Requirements can be imported from external sources, and you can receive automatic notification when requirements change. You can view the requirements and design together, establish links with drag and drop, annotate diagrams with requirements, context, and...

## [Simulink Coverage](#)



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### Simulink Coverage

NEW PRODUCT

Overview | Features

**Measure test coverage in models and generated code**

Simulink Coverage™ performs model and code coverage analysis that measures testing completeness in models and generated code. It applies industry-standard metrics such as decision, condition, modified condition/decision coverage (MC/DC), and relational boundary coverage to assess the effectiveness of simulation testing in models, software-in-the-loop (SIL), and processor-in-the-loop (PIL). You can use missing coverage data to find gaps in testing,...

## [Simulink Check](#)



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### Simulink Check

NEW PRODUCT

Overview | Features | Model Examples | Videos | Webinars | What's New | ...

**Verify compliance with style guidelines and modeling standards**

Simulink Check™ provides industry-recognized checks and metrics that identify standard and guideline violations during development. Supported high-integrity software development standards include DO-178, ISO 26262, IEC 61508, IEC 62304, and MathWorks Automotive Advisory Board (MAAB) Style Guidelines. Edit-time checks identify compliance issues as you edit. You can create custom checks to comply with your own standards or guidelines.

# Learn More

See License Related Changes link at [mathworks.com/release](https://mathworks.com/release)

If you are:

<p><b>Subscribed to Software Maintenance Service as of R2017b for Simulink Verification and Validation</b></p>	<p>License(s) will be updated to include the following products at no initial cost:</p> <ul style="list-style-type: none"> <li>Simulink Check</li> <li>Simulink Coverage</li> <li>Simulink Requirements</li> </ul> <p>They will appear on future Software Maintenance Service renewal invoices.</p>
<p><b>Not subscribed to Software Maintenance Service as of R2017b for Simulink Verification and Validation</b></p>	<p>License(s) will be updated to include the following products at no initial cost:</p> <ul style="list-style-type: none"> <li>Simulink Check</li> <li>Simulink Coverage</li> <li>Simulink Requirements</li> </ul> <p>You will need to renew your Software Maintenance Service subscription to access the updated products.</p>