

Strategies for MATLAB and Simulink Upgrades

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MathWorks Automotive Conference 2016

Upgrade Constraints



Windows

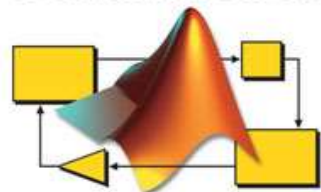


Compilers



MathWorks

Co-Simulation



Partner

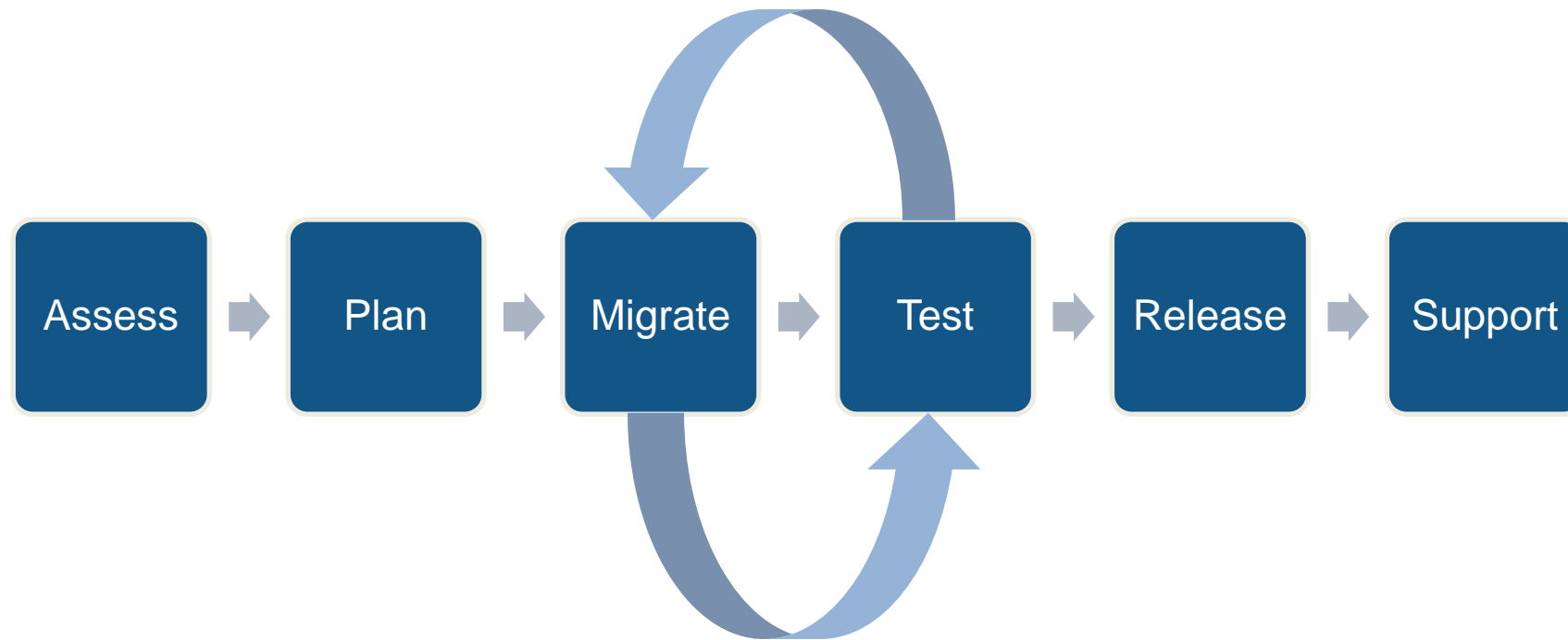


Linux

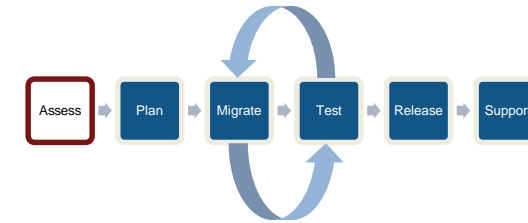
Upgrade Challenges

- Short time between projects to upgrade
- Encountered a show-stopping issue after an upgrade
- Limited knowledge of new features and their impact on the process
- Took multiple years to upgrade to a new version
- Custom tools don't work in the new version
- Maintaining hundreds to thousands of models
- Will have to revalidate the models and code
- Users want to stay in the old version

Upgrade Workflow



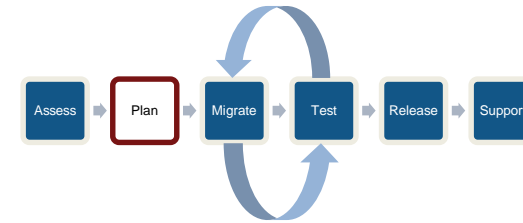
ASSESS



- Choose a Target Version
 - Review [Release Notes](#) and [Bug Reports](#)
 - Contact MathWorks partners to verify which versions they support
 - Choose and change your target version if necessary
- Initial Testing
 - Run Upgrade Advisor on a model
- Regression Testing
 - Run regression tests on tasks that users commonly perform
 - Better to find the issues now than find them later



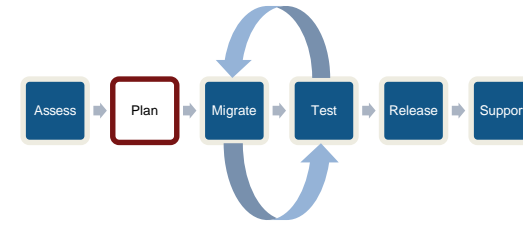
PLAN: Create a Business Case



- New features that will improve your workflows
- Upgrading to a new operating system
- Third party software will no longer support your version



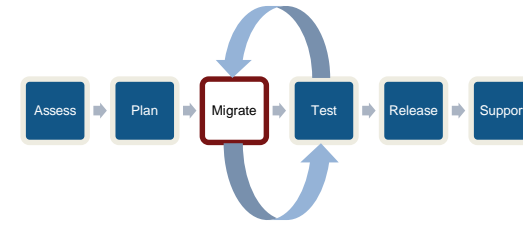
PLAN: Define Your Goals Upfront



- Limit the scope of the upgrade process
 - Don't try to do everything
- Upgrade existing models to a new version
 - Upgrade models without introducing new features
 - Validate models in the new version
- Upgrade custom tools to a new version
 - Replace custom tools with built-in Simulink functionality



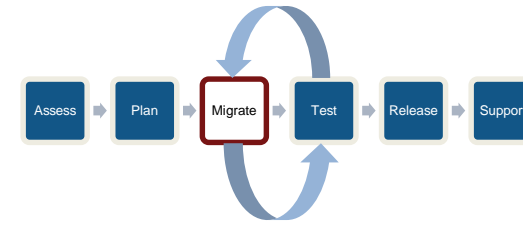
MIGRATE: Initial Migration



- Select a large model to test the upgrade process
 - Complies with your modeling style guidelines
- Run Upgrade Advisor on the model
- Test your typical workflows
- Document warning and error messages
- Expand testing to more models
 - Different modeling styles
- Resolve the issues

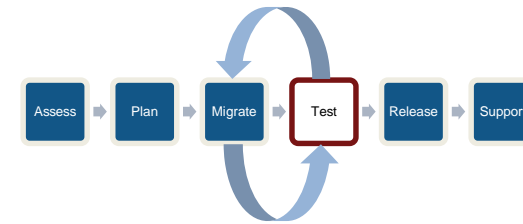


MIGRATE: Automated Migration



- Automate the conversion process
- Create one MATLAB script that calls everything
- Recommend that the model expert convert his/her models
 - Aware of production deadlines
 - Will need to validate the model

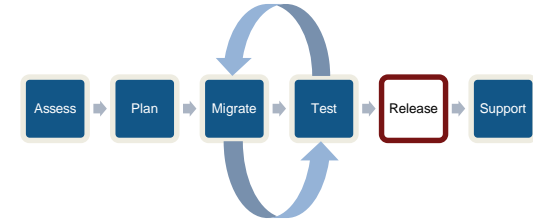
TEST



- Custom Tools
 - Verify the custom tools perform the intended behavior in the new version
- Third Party Tools
 - Test third party tools with the new version
- Beta Testing
 - Start using the new MATLAB version for everyday work



RELEASE



- Training
 - New Features
 - Custom Tools
- Timing
 - Needs to be flexible
 - Don't want to impact a production schedule
 - New models should use the new version
 - Set a deadline for the rest of the models

Continuous Upgrade Philosophy

- Prerelease Testing
 - Test your models and custom tools for each prerelease
 - Send your feedback to the MathWorks
 - Don't wait until your next upgrade to start testing
- Industry Model Testing
 - Submit models to MathWorks Industry Model Testing
 - MathWorks will run tests on your models prior to the prerelease
 - Dramatically reduces the chance of release incompatibilities
- Seminars
 - To keep up to date with MathWorks new features
 - Will help you decide what version to upgrade to

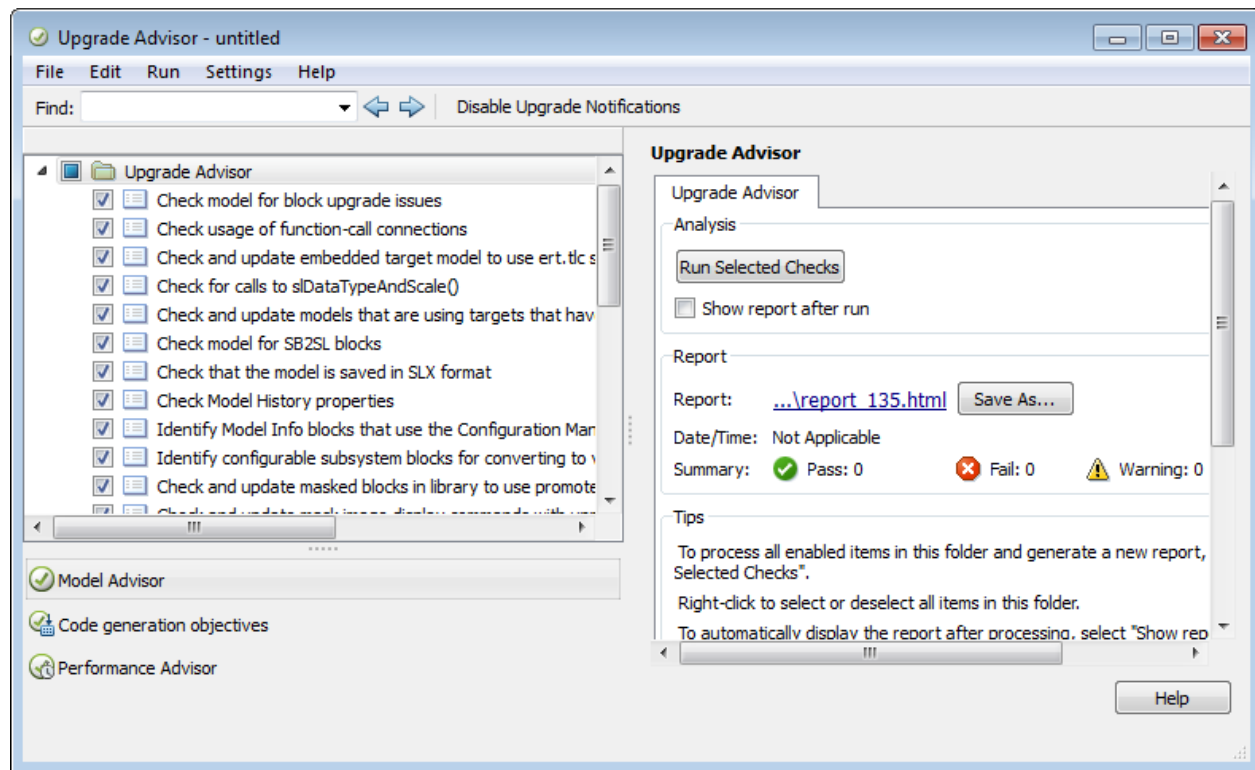


Benefits

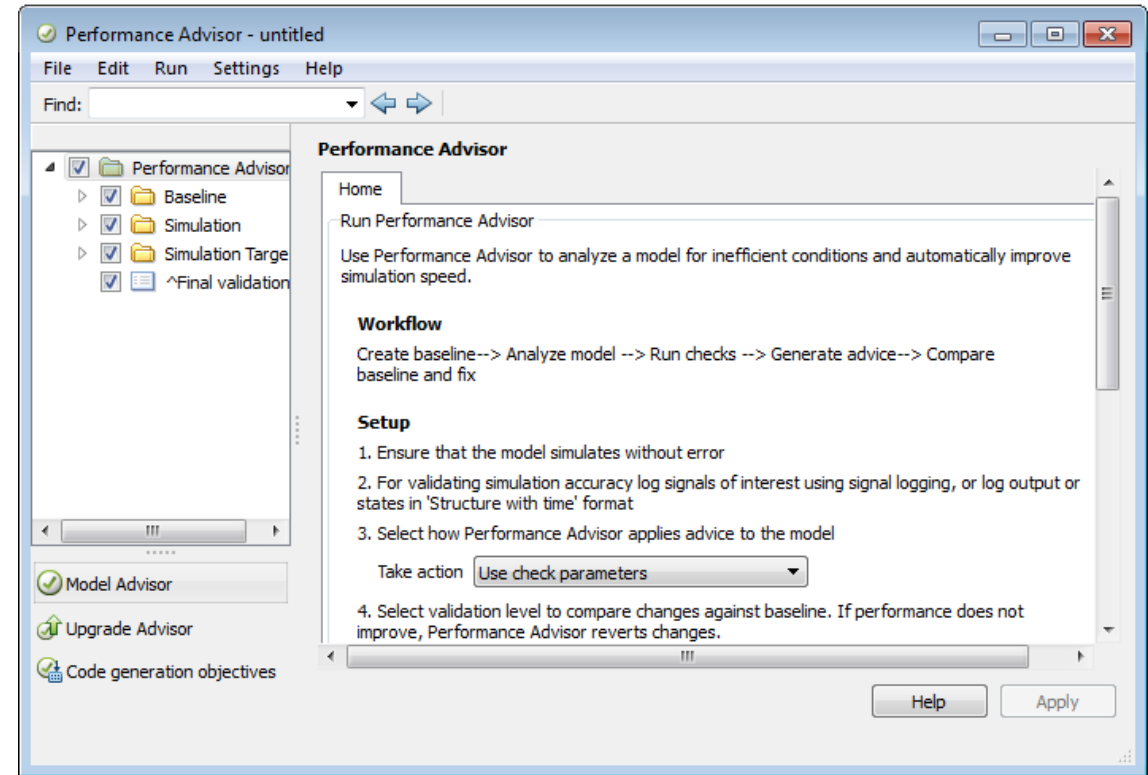
- Surprises are minimized.
- You don't have to wait to use new features.
- The new version is released in a timely manner.
- MathWorks may resolve your issues before your next upgrade.
- Your future upgrades will be easier.

TOOLS

Upgrade Advisor



Performance Advisor




TOOLS

Simulink Test

Products Solutions Academia Support Community Events Company

Simulink Test

Develop, manage, and execute simulation-based tests



Overview
Features
Model Examples
Videos
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Related Products
What's New
Product Trial

Simulink Test™ provides tools for authoring, managing, and executing systematic, simulation-based tests of models, generated code, and simulated or physical hardware. It includes a Test Sequence block that lets you construct complex test sequences and assessments, and a test manager for managing and executing tests. Simulink Test enables functional, baseline, equivalence, and back-to-back testing, including software-in-the-loop (SIL), processor-in-the-loop (PIL), and real-time hardware-in-the-loop (HIL). You can apply pass and fail criteria that include absolute and relative tolerances, limits, logical checks, and temporal conditions. Setup and cleanup scripts help you automate or customize test execution.


You can create nonintrusive test harnesses to test components in the system model or in a separate test model. You can store test cases and their results, creating a repository for reviewing and investigating failures. You can generate reports, archive and review test results, rerun failed tests, and debug the component or system under test.

With Simulink Test and Simulink Verification and Validation™, you can link test cases to requirements captured in Microsoft® Word, IBM® Rational® DOORS®, and other documents.

Support for industry standards is available through [IEC Certification Kit](#) (for IEC 61508 and ISO 26262) and [DO Qualification Kit](#) (for DO-178).

Key Features

- Create Test Harnesses
- Author Test Sequences and Assessments
- Manage Test Plans and Test Execution
- Perform Functional and Back-to-Back Testing
- Analyze and Share Test Results




Product Overview

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What's New

 From Meaghan O'Neil, Simulink Test Technical Expert

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Documentation
 Blocks

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Upgrade MATLAB and Simulink

Why Upgrade?

Get more out of MATLAB® and Simulink® by upgrading to the latest versions of your products. Most users can download the latest release and get started using the new features right away.

Users who rely on critical applications and models built in MATLAB and Simulink see the benefits of upgrading regularly.

- Maximize the value of your MATLAB and Simulink software
- Take advantage of the features you requested
- Increase workflow efficiency and build confidence in your solutions
- Save time by upgrading regularly

» How do I upgrade?
 » Contact support for help upgrading
 » Upgrade now

Maximize the value of your MATLAB and Simulink software

Get the most out of MathWorks Software Maintenance Service. Every year, MathWorks delivers a steady stream of new technology, customer-requested product enhancements, and quality improvements. Join other companies in taking advantage of the features that you are helping to improve.

Upgrade Overview new

Explore the benefits of upgrading your MATLAB and Simulink products to the latest release.

“When new tools become available to improve your process, you have to maintain a growth opportunity to make use of them.”

— David Viazzi,
 Allensium Engineering & Integration Company

SUPPORT

Technical Support

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Support Support - 🔍

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Eligibility: Access to technical support requires a valid license number and a Software Maintenance Service subscription.

Students: Technical support from MathWorks is available for activation, installation and bug-related issues. For additional help visit our [student resource page](#) or contact your instructor.

Did You Try?

- Installation Help**
Explore resources for installation, activation, and startup
- Documentation**
Explore MathWorks Documentation
- MATLAB Answers**
Ask questions and get answers

Call Us

Office Hours Customer Support (Monday-Friday) Hours: 08:30-17:30 ET Technical Support (Monday-Friday) Hours: 08:30-20:00 ET	Contact Phone Customer Support: 508-647-7000 Technical Support: 508-647-7000	Change Country/Region <input type="text" value="Select your country/region"/>
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Consulting Services

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MATLAB and Simulink Consulting Services 🔍

[Overview](#) [Getting Started](#) [Proven Solutions](#) [Customer Success Stories](#) [Meet Our Team](#)

Software Upgrade Service

Upgrading to the latest software version gives access to new functionality for improved performance, scalability, management of complexity, and compliance with regulatory standards.

MathWorks Consulting Services applies best practices gained from previous customer upgrades, and **insider knowledge of MATLAB and Simulink enhancements** to help you complete a seamless and efficient migration to a new release.




Questions? [👁](#)

[Contact Consulting](#)

Meet Our Team

Vinod Reddy, a MathWorks Consulting Services manager, helps organizations apply Model-Based Design to develop and verify embedded systems.



Upgrade Plan - Mitigate Risk and Maximize New Functionality Benefits

We assess your current models, tools, and development processes and develop a **customized upgrade strategy**. We identify new **MATLAB** and **Simulink** features that can be leveraged to meet your current and future business and technical goals. We ascertain any custom tools, patches, and infrastructure that can be retired or optimized with the upgrade.

Upgrade Impact Testing and Issues Resolution

MathWorks Consultants perform an **upgrade impact test** on your practice workflow, models, tools, and development processes that highlights and addresses any issues. We document any incompatibilities and issues related to your models, processes, custom and third-party tools and work with you to resolve them.



MATLAB and Simulink Upgrade Experience

Chris DeBoer

Eaton Corporation – Vehicle Group

Upgrade Process Overview

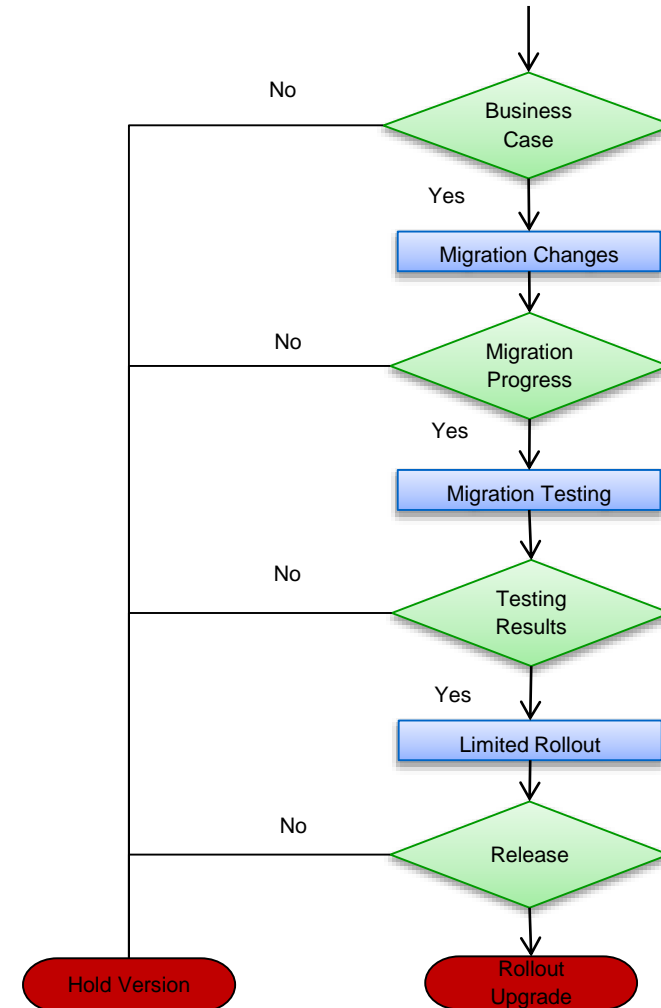
- Assess the Current Situation
- Plan Business Case and Decision Gates
- Migration Activities
- Testing the Upgraded Toolchain
- Release Process

Assess the Current Situation

- Initial Investigation
 - Revealed Enterprise move to new OS
 - Discovered issues with Custom Storage Classes
- Consultation with MathWorks
 - Changed Target version from R2014b to R2015b
 - Received guidance to resolve Custom Storage Class issues

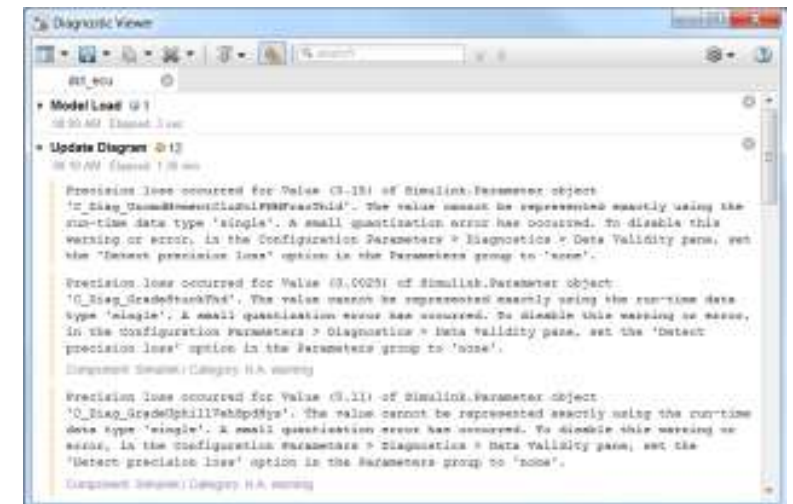
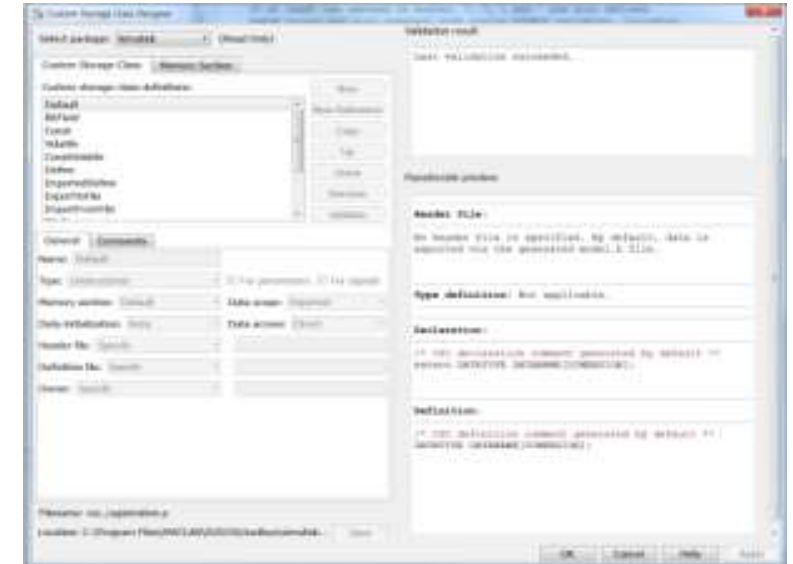
Create Business Case and Decision Gates

- Business Considerations
 - Cost: Time, Resources
 - Program Timing
 - Risks
- Decision Gates
 - Business Case
 - Migration Progress
 - Testing
 - Pre-Release



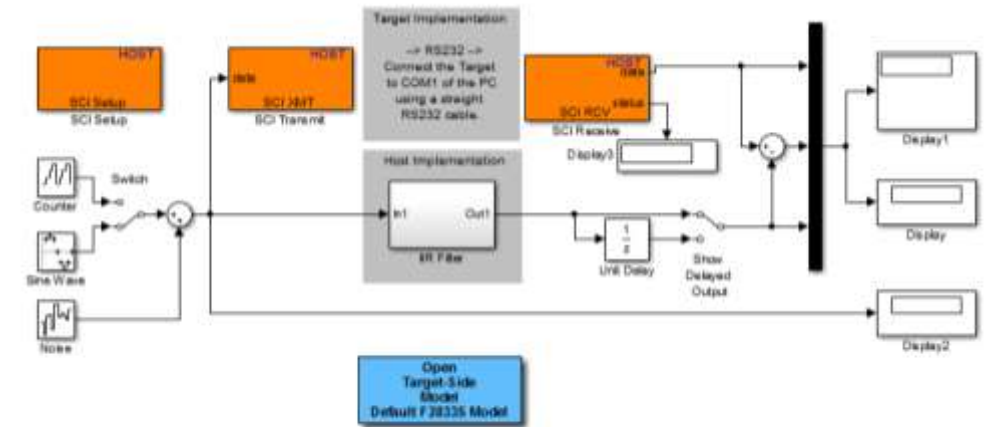
Migration Activities and Testing

- Upgrade Custom Storage Classes
 - Format Change from R2011b to R2012a
- Resolve New Errors and Warnings
 - Heavy use of “Update Diagram”
 - Limited use of Upgrade Advisor
- Update TLC files
- Update Build process
 - Legacy Build process to Standard Build process



Testing

- Simulation Testing
- HiL Testing
- Test Cell Testing
- Vehicle Testing



Release

- User Installation
 - Installation Information distributed prior to Release
 - Required confirmation of simulation and build
- User Training
 - User Interface
 - New build process
- User Testing
 - Beta Testers verify updated toolchain
- Full Release