2021x Refresh2 Version News

Magic Cyber Systems Engineer

Released: December 3, 2021

In this release, the Behavior-to-Structure Synchronization has undergone further improvements and now allows to completely synchronize the entire structure model with the behavior model. Additionally, the Requirements verification can now be performed directly in the Requirement Table. Moreover, the enhancements for Modelica allow importing Modelica files as well as extending the model generated as a Modelica code, using a Comment element with the «ModelicaExtension» stereotype.

The performance improvements to both the client-side and Teamwork Cloud-side as well as integration, general modeling, and collaborative modeling enhancements.

On the integrations side, ReqIF Import/Export improvements come into effect. For general modeling, this release presents improvements to Structured Expressions.

Finally, collaborative modeling has been extended to enable users to automatically clone used projects together with the main project.

To download the latest version, see Downloading installation files. Don't forget to give us your feedback on LinkedIn, Twitter, or Facebook. For further information, check the product documentation.

2021x Refresh2 HotFix 5 available

Due to Cassandra 3.11 approaching its end of life, the 2021x Refresh2 HotFix 5 has been released on April 21, 2023. This HotFix addresses the issue by supporting Cassandra 4 and introduces a number of bug fixes and performance improvements.

2021x Refresh2 Hot Fix 4 available

2021x Refresh2 Hot Fix 4 has been released on July 15, 2022, for CATIA Magic and No Magic portfolios. It introduces a number of bug fixes and performance improvements.

2021x Refresh2 Hot Fix 2 available

Due to the Apache Log4j vulnerability issues, the 2021x Refresh2 HF2 has been released on March 4, 2022. The HF2 addresses Log4j 1.x and 2.x versions.

2021x Refresh2 Hot Fix 1 available

Due to the Apache Log4j vulnerability issues, the 2021x Refresh2 HF1 has been released on December 22, 2021. The HF1 addresses Log4j 2.x versions.
Also, see the Knowledge Base article at https://kb.dsxclient.3ds.com/mashup-ui/page/resultqai?id=QA00000102301e.

Hot Fix version compatibility

The version and Hot Fix number of a modeling tool and its plugins must be the same. After installing the Hot Fix version of a modeling tool, select the same Hot Fix version when downloading its plugins. The modeling tool will not work correctly if you install plugins of a different version and/or Hot Fix number.
Also, see the Knowledge Base article at https://kb.dsxclient.3ds.com/mashup-ui/page/resultqai?id=QA00000102301e.

SysML Features

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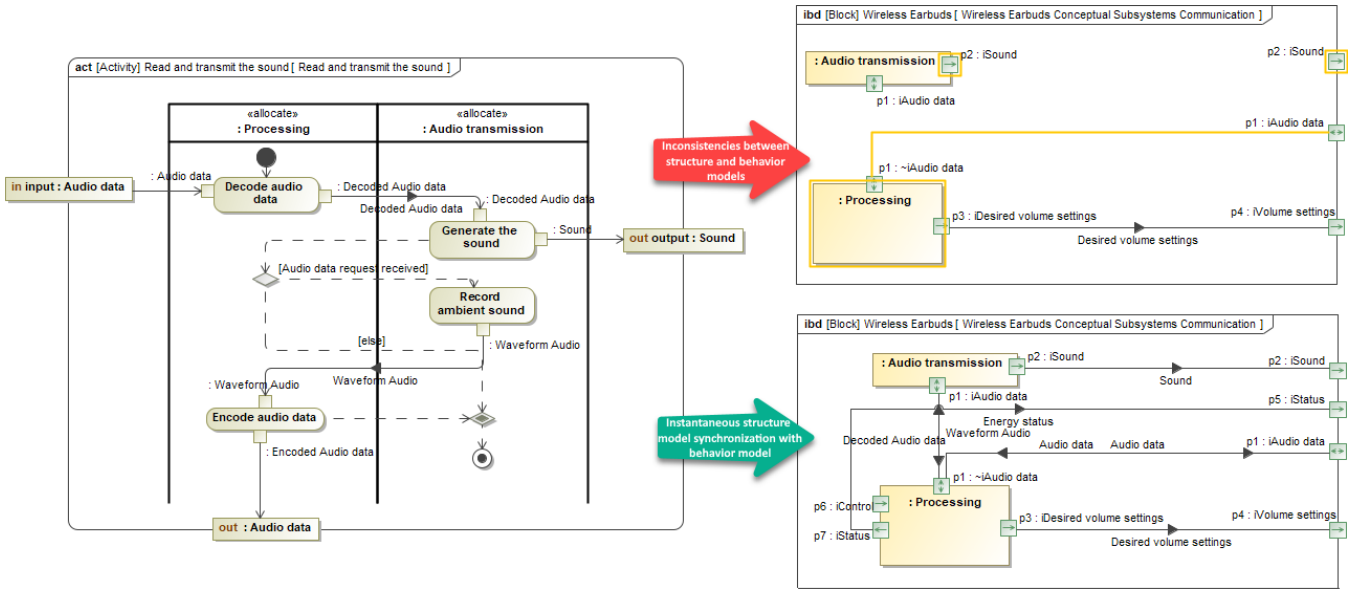
SysML Features

Behavior-to-Structure Synchronization

The Behavior-to-Structure Synchronization has undergone further improvements to enable you to completely synchronize the entire structure model with the behavior model. First, the set of validation rules has been extended by introducing the brand new validation rules for the detection of missing Connectors and Item Flows. That is not all! You can now automatically build the structure model according to defined Activities and, at the same time, generate an Internal Block Diagram by executing a single-click command.



Checking the consistency of the Internal Block Diagram with Activities and then handling detected inconsistencies using solvers.

Learn more about behavior to structure synhronization>>

Requirements Verification in Table

The Requirements verification can now be performed directly in the Requirement Table. The analysis is carried out by evaluating whether the value of the property satisfying the Requirement is within a range of lower and upper bounds extracted from the Requirement text. Additionally, the automatically calculated margin value helps to determine how close the system model is to fulfilling Requirements.

Criteria

Scope (optional): SUV_REGULAR Requirements ... Filter: Context (optional): SUV_REGULAR ...

Requirement Verification: Pass Fail

#	Name	Text	Property	Bounds	Value	Margin
1	1 SUV_REGULAR Requirements					
2	1.1 Spring Coils	Spring shall have less than 8 coils.	suspension.spring.coils : Real	<8	7	1
3	1.2 Spring Deflection Distance	Spring shall have not more than 108-mm deflection distance.	suspension.spring.deflectionDistance : diameter[metre]	<=108	132	-24
4	1.3 Spring Free Length	The spring shall have a free length of 200 mm.	suspension.spring.freeLength : distance[millimetre]	=200	160	-40
5	1.4 Spring Outer Diameter	The diameter shall be less than 105 mm and more than 95 mm.	suspension.spring.outerDiameter : diameter[millimetre]	(95;105)	85	-10
6	1.5 Shock Absorber Length	Overall shock absorber length shall be at maximum of 600.	suspension.shockAbsorber.length : distance[millimetre]	<=600	450	150
7	1.6 Shock Absorber Weight	Shock absorber shall weight not more than 4 kg.	suspension.shockAbsorber.weight : mass[kilogram]	<=4	3	1
8	1.7 Tire Diameter	The tires shall have 18-inch rolling diameter.	suspension.wheel.tire.diameter : Integer	=18	17	-1
9	1.8 Tire Height	The tire height shall be not less than 45 and not more than 60.	suspension.wheel.tire.height : distance[millimetre]	[45;60]	50	5
10	1.9 Tire Width	The tire width shall be between 205 and 270 millimeters.	suspension.wheel.tire.width : distance[millimetre]	[205;270]	185	-20
11	1.10 Rim Diameter	The rim diameter shall be equal to 17 inch.	suspension.wheel.rim.diameter : length[inch]	=17	17	0
12	1.11 Rim ET	The rim shall have ET of 10.	suspension.wheel.rim.ET : Real	=10	9	-1
13	1.12 Rotor Diameter	The brake rotors shall not exceed 0.28 meter diameter.	brake.rotor.rotorOuterDiameter : diameter[millimetre]	<=0.28	0.29	-0.01
14	1.13 Pad Center Length	The Pad Center Length shall be between 0.075 and 0.14 meters.	brake.pad.padLength : length[metre]	[0.075;0.14]	0.15	-0.01
15	1.14 Brake Pad Life	Brake pads shall have a projected life of at least 57500 km.	brake.pad.padLifeSpan : distance[kilometre]	>=57500	90000	32500
16	1.15 Pad Width	The Pad width shall be more than or equals 45e-3 and less than 65e-3 meters.	brake.pad.padWidth : diameter[metre]	(0.045;0.065)	0.042	-0.003

Performing the Requirements verification analysis in the Requirement Table.

Learn more about Requirements verification>>

Modelica Enhancements

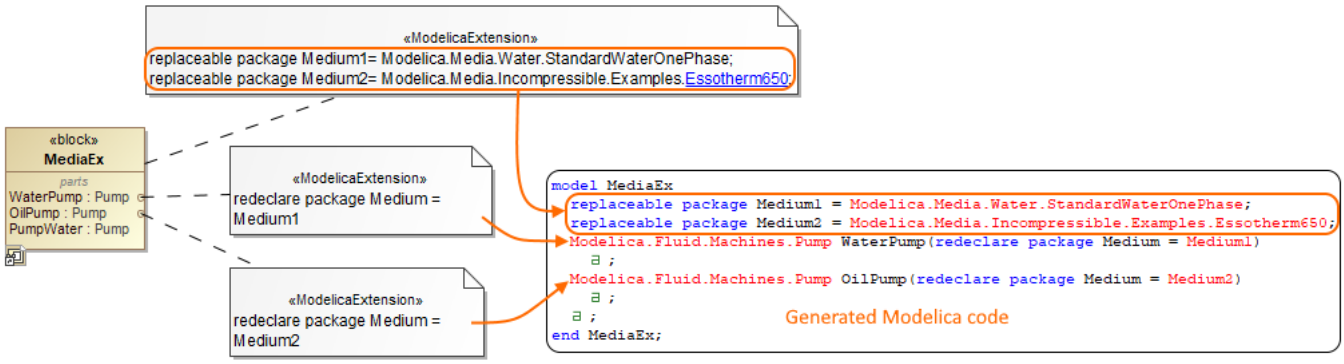
Importing from Modelica file

In this version, the Modelica import was enhanced. Previously, only Modelica Library import was available. Now you can import the Modelica file (*.mo) content into the single selected Block of your SysML model. During the import, context-specific initial values can be updated or missing classifiers can be created. Furthermore, connector, property, and port changes are also supported.

Learn more about Modelica import >>

Extending models with Comments

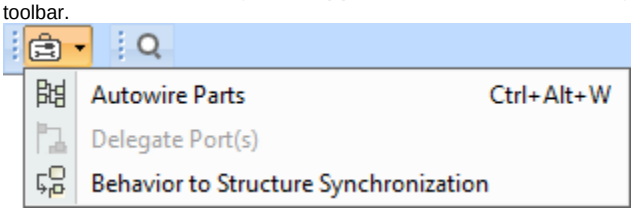
You can extend the model generated as a Modelica code, using a Comment element with the «ModelicaExtension» stereotype. The Modelica Extension content is exported to the Modelica file together with the model. As a result, the code is generated depending on where the Comment is attached.



Learn more about extending the model >>

Other Enhancements

- The Autowiring command was renamed Autowire Parts. You can find this command in the IBD diagram toolbar, Tools menu.
- The **Autowire Parts**, **Delegate Port(s)**, and **Behavior to Structure Synchronization** commands have been grouped under Tools in the diagram toolbar.



- You can now easily check if the Item Flow realized by the Object Flow is compatible with Pin types in a SysML Activity Diagram.
- You can now easily check the sent Signal compatibility with the Proxy Port specified in the **On Port** property of the Send Signal action or the compatibility of the accepted Signal with the Proxy Port specified in the **Port** property of the Accept Event action in a SysML Activity Diagram.

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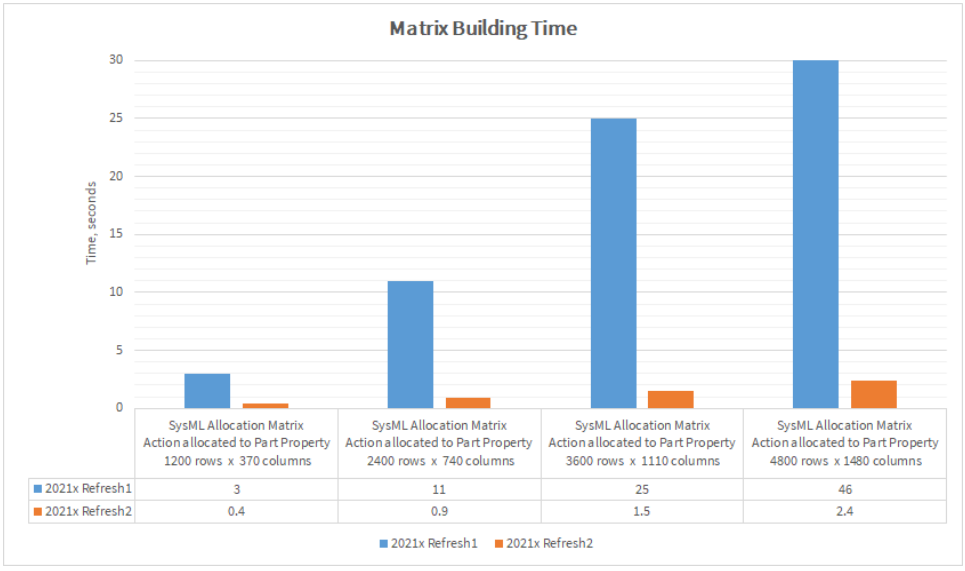
Performance Improvements

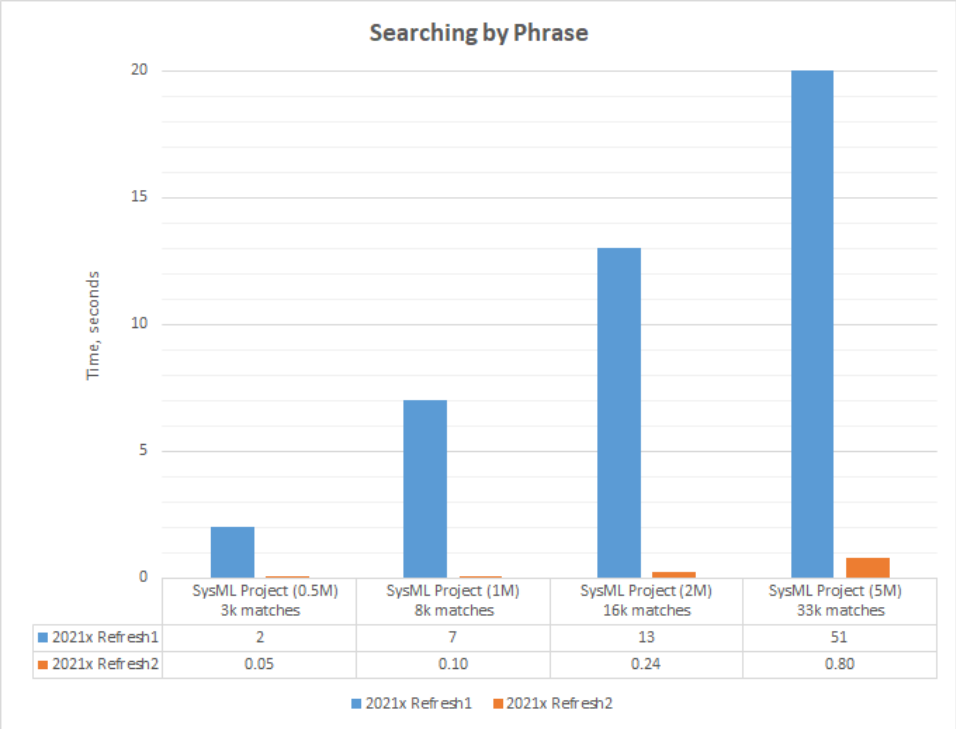
Client-side Performance Improvements

- **Dependency Matrices**. Experience enhanced in matrix building performance. From now on, large matrices are built up to 20 times faster compared to 2021x Refresh1.



A chart comparing the SysML Allocation Matrix building time in 2021x Refresh1 and 2021x Refresh2 projects.

- **Find**. Now you can perform a search by phrase in the model 40-70 times faster compared to 2021x Refresh1. This is applicable to **Find** and **Find and Replace** dialogs as well as the Find operation used in Structured Expressions (e.g., Derived Properties, Smart Packages, Tables, Matrices, etc.)



A chart comparing the search by phrase time in 2021x Refresh1 and 2021x Refresh2 projects.

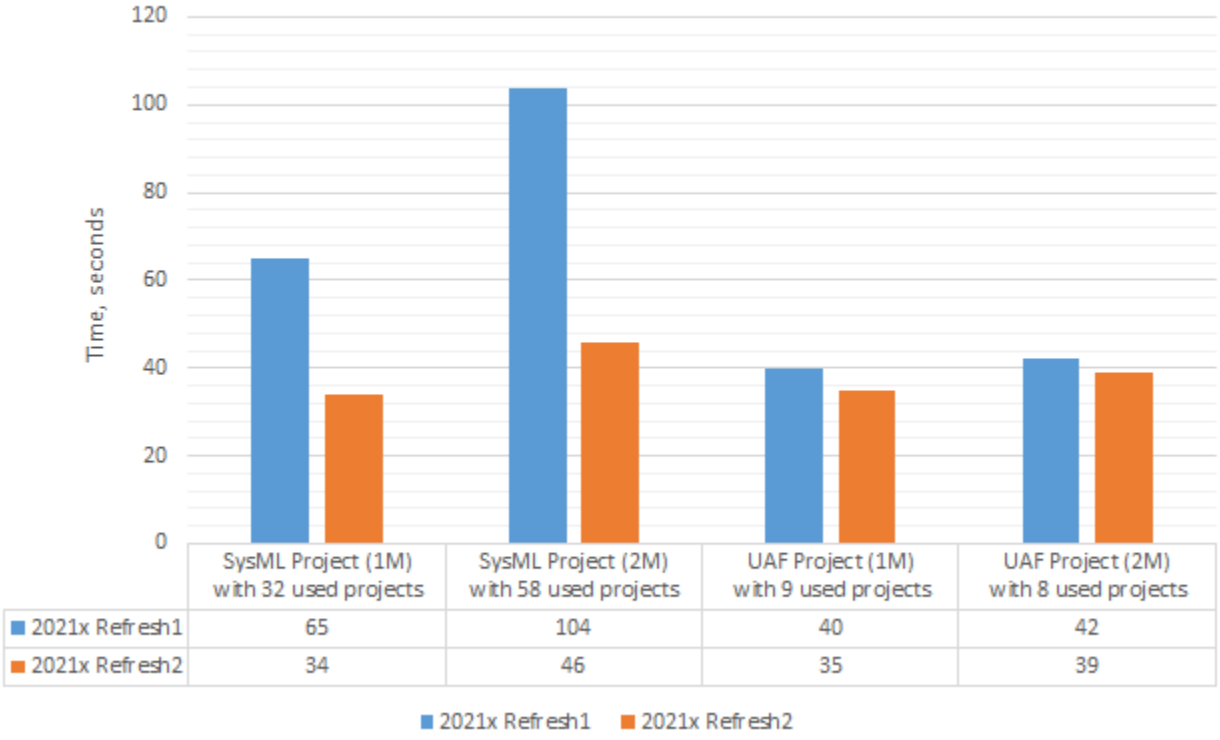
- **Element selection dialog**. Further performance improvements have been introduced to element selection (i.e., the **Select Element** dialog and drop-down lists). The element search can now be performed instantly when using **Filter By Package Imports** for context-specific type selection.

Teamwork Cloud-related Performance Improvements

Performance Improvements Under Slow Network

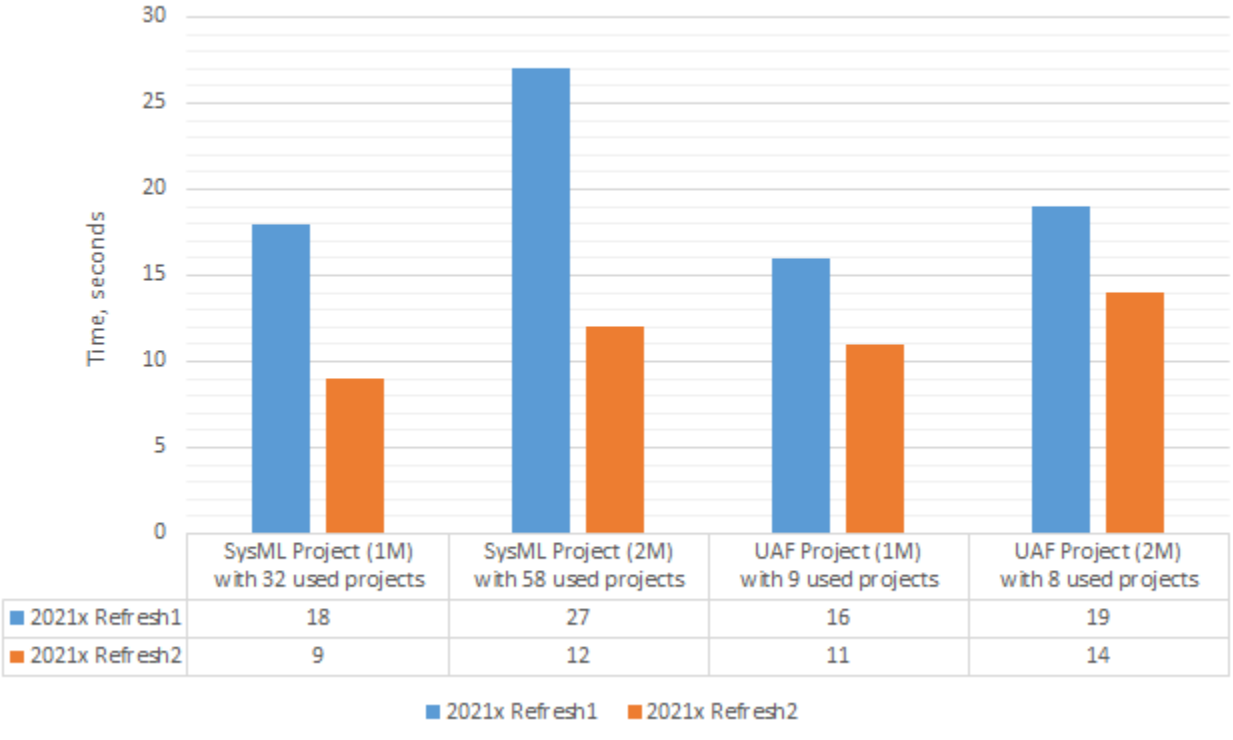
Performance improvements have been implemented to optimize working with Teamwork Cloud projects containing a set of used projects in slow network environments (ping time >115 ms).

Project Load

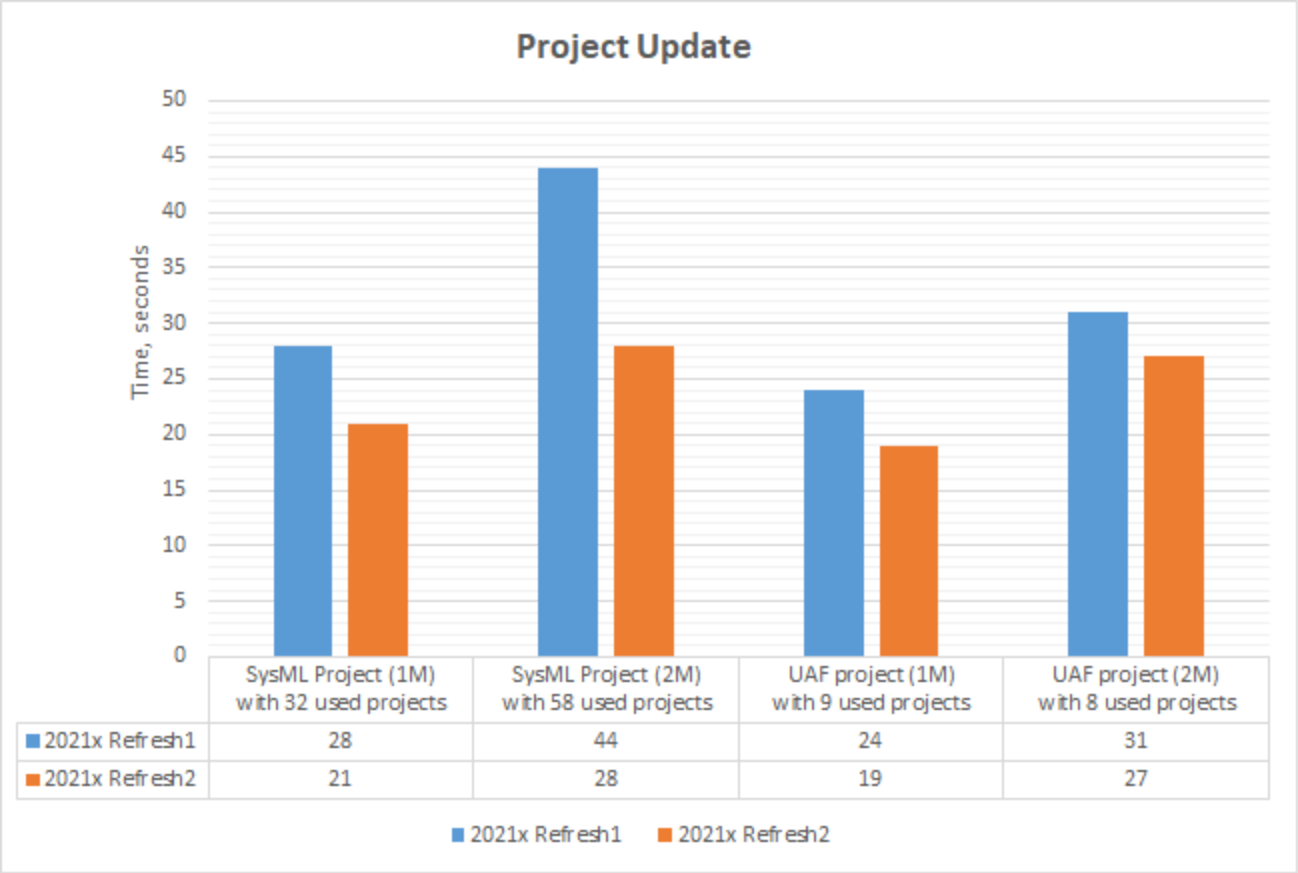


	SysML Project (1M) with 32 used projects	SysML Project (2M) with 58 used projects	UAF Project (1M) with 9 used projects	UAF Project (2M) with 8 used projects
2021x Refresh1	65	104	40	42
2021x Refresh2	34	46	35	39

Project Commit



	SysML Project (1M) with 32 used projects	SysML Project (2M) with 58 used projects	UAF Project (1M) with 9 used projects	UAF Project (2M) with 8 used projects
2021x Refresh1	18	27	16	19
2021x Refresh2	9	12	11	14



A chart comparing the Project Load, Project Commit, and Project Update operations speed in slow network environments.

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Integrations

Effectivity Import for TRM Requirements

Requirements from the TRM application on the 3DEXPERIENCE platform can be imported/synchronized into the modeling tools using Cameo DataHub. With 2021x Refresh2, DataHub can also import the effectivity markings of the requirements as equivalent variation points in the modeling tools.

The PLE mechanisms (variant highlight, variant realization transformation) can then be applied to these variable requirements.

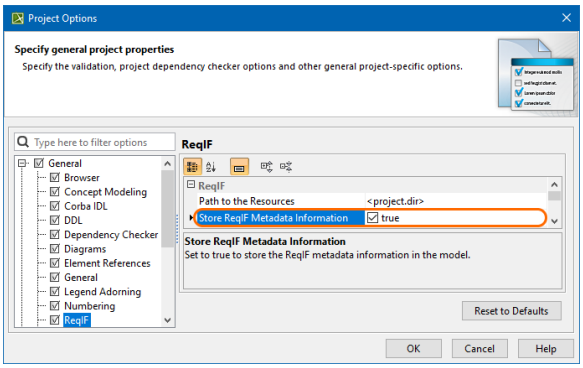
As a prerequisite for effectivity import, Model Version variability and configurations have to be imported beforehand. Learn more about importing variability data >>

Note. The effectivity import is unidirectional. You can import from the 3DEXPERIENCE platform to the modeling tools.

Learn more about importing effectivity >>

ReqIF Import/Export Improvements

Further enhancements have been implemented for the ReqIF import/export plugin. A new project option **Store ReqIF Metadata Information** has been introduced to ensure ReqIF standard-compliant round-trip of data between the modeling tool and any other ReqIF standard-compliant tool. Once enabled, element IDs found in ReqIF files are retained when such files are imported into the modeling tool. As a result, elements updated in the modeling tool and exported back to external ReqIF-compliant tools are no longer treated as new.



The project option to store the ReqIF metadata in the model.

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Modeling and Infrastructure

Structured Expressions Improvements

Long-awaited improvements have landed! Working with Structured Expressions is now more convenient and less confusing.

- The Comparison operations, such as Equals, GreaterThan, and LessThan, can consume a set containing a single element, for instance, as returned by Metachain Navigation and Simple Navigation operations
- In cases you cannot find the needed property for the Property Test operation, you can now show the full list of properties instead of limiting it to properties applicable to the contextual element type only.
- Now all template operations (Simple Navigation, Metachain Navigation, Find, and Implied Relation) are represented in italic to clearly indicate that they are not specified. As a result, constant double-checks and manual removals of empty operations are no longer needed.
- You can now apply changes to the Parameter name without the fear of breaking its usages within the Structured Expression specified in the Opaque Behavior body.

Stay tuned, more enhancements are coming in future versions!

Learn more about Structured Expressions>>

Other Improvements

- From now on, suspect links in used projects are ignored when performing the suspect links analysis, meaning that the scope of the analysis is narrowed down to only relevant elements.
- The **Notification Window** is no longer opened automatically when opening projects and switching between or creating new projects since the **Notification Window** status (open/closed) is now respected for each project individually.

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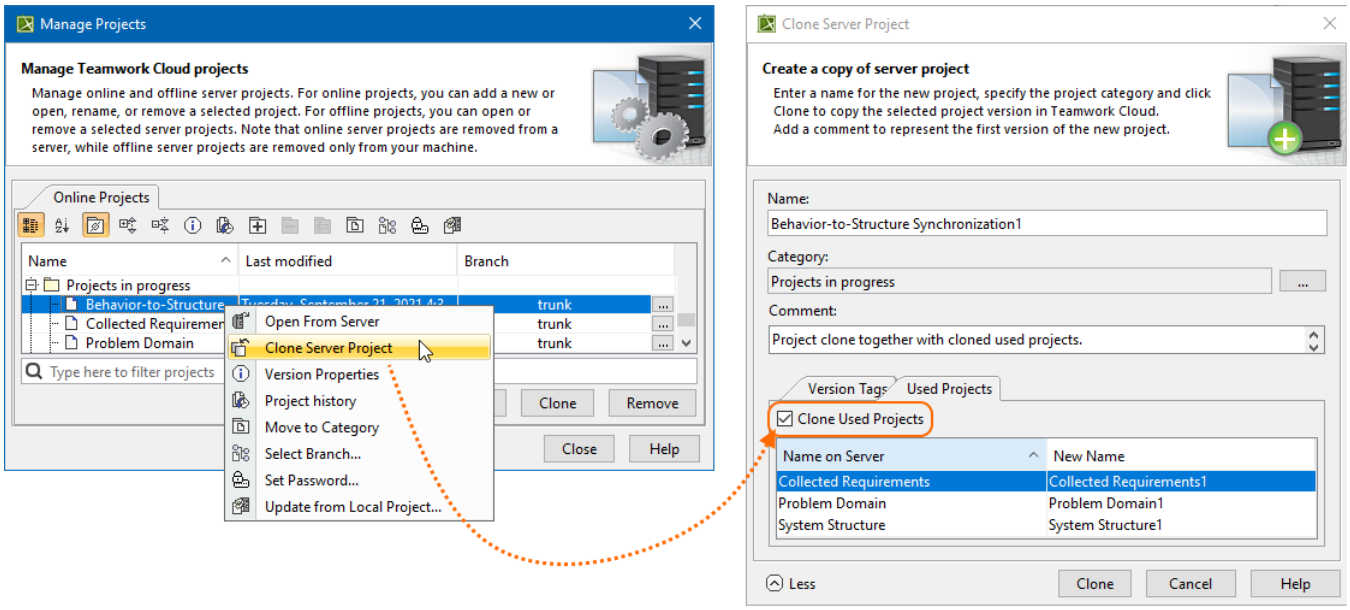
Collaboration

Cloning Used Projects

Project cloning has been upgraded! For more effective working with Teamwork Cloud projects, you can now clone used projects together with the main project automatically by simply selecting a checkbox.



Cloning used projects together with the main project.

Other Teamwork Cloud-related Improvements

- For security reasons, you can now add an argument to the properties file of the modeling tool to hide logging in to Teamwork Cloud with the username/password.
- From now on, you can access the properties of the selected version much quicker since the **Version Properties** button has been added to the toolbar and the shortcut menu of the Content History and element History panels.
- The Package permissions dialogs have been improved for usability purposes.

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Report Wizard

- In this version, Report Wizard comes with an additional capability of getting derived property value by using **$report.getStereotypeProperty()** and **$report.getStereotypePropertyString()**.
- With **$report.isTypeOf(element, stereotypeName)** for checking a supertype of the specific element, you are now able to check whether an element is a subtype of the specified stereotype. Get familiarized with this report tool >>
- The new **Includes other files** option in the **Export** dialog allows you to include related files of an exported template into the same MRZIP file. Learn more about the Template Management pane >>
- You can now customize page orientation and margin in double or String values with **$pageprop.setPortrait($top, $bottom, $left, $right)** and **$pageprop.setLanscape($top, $bottom, $left, $right)** functions. You can also set page orientation to portrait or landscape with **$pageprop.setPortrait()** and **$pageprop.setLandscape()** functions for generated reports. Learn how to customize the margin and set page orientation >>
- The current Velocity Template Language has been upgraded from Version 1.6.2 to 2.2. Find out more about the velocity templating language >>

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