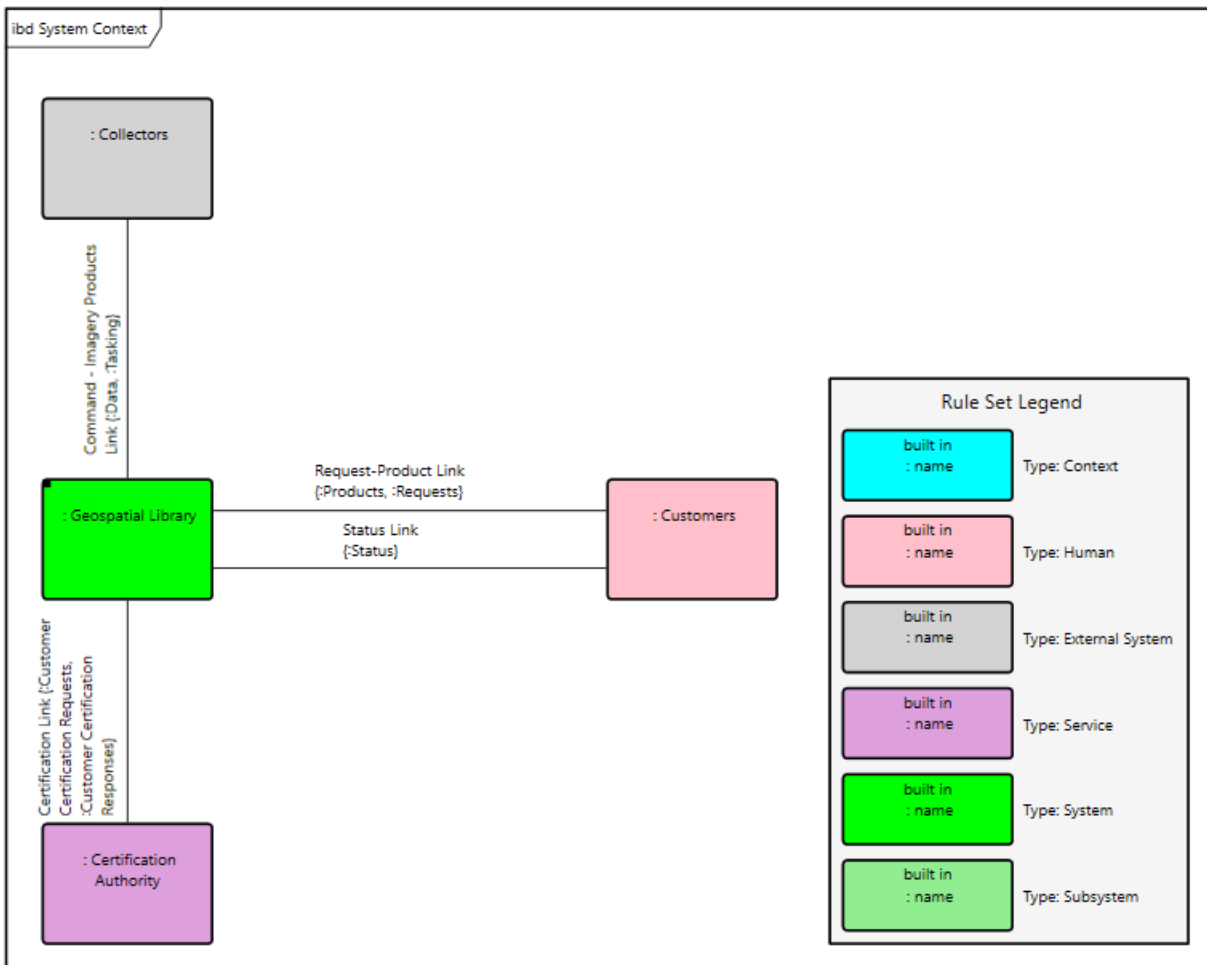


WHAT'S NEW IN GENESYS 2022

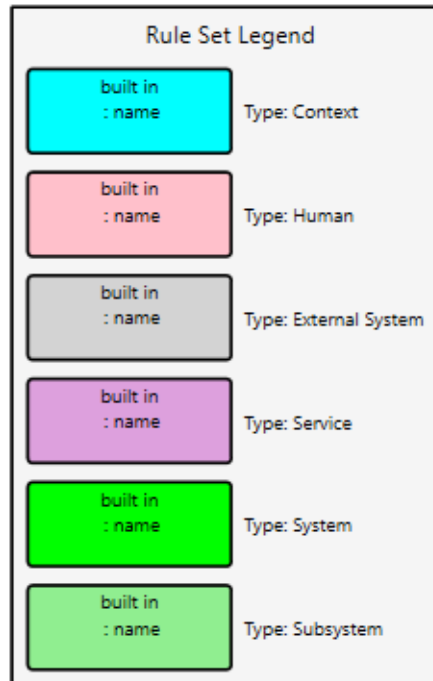
NEW FEATURES

DIAGRAM LEGENDS IMPROVEMENTS

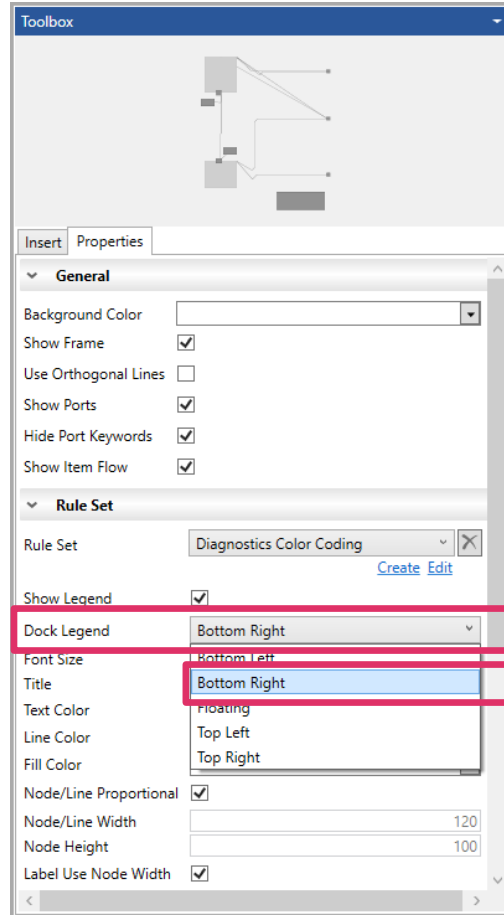
Legends add enormous meaning to diagrams through visual classification cues. GENESYS 2022 can automatically generate diagram legends based on rule sets. These legends explain the rule-based formatting of the diagrams. The formatting rules can apply to the entire diagram, all nodes/lines/other items, or specific nodes/lines/items in the diagram.



At a glance, you can tell that the pink blocks on the diagram are type *Human*.

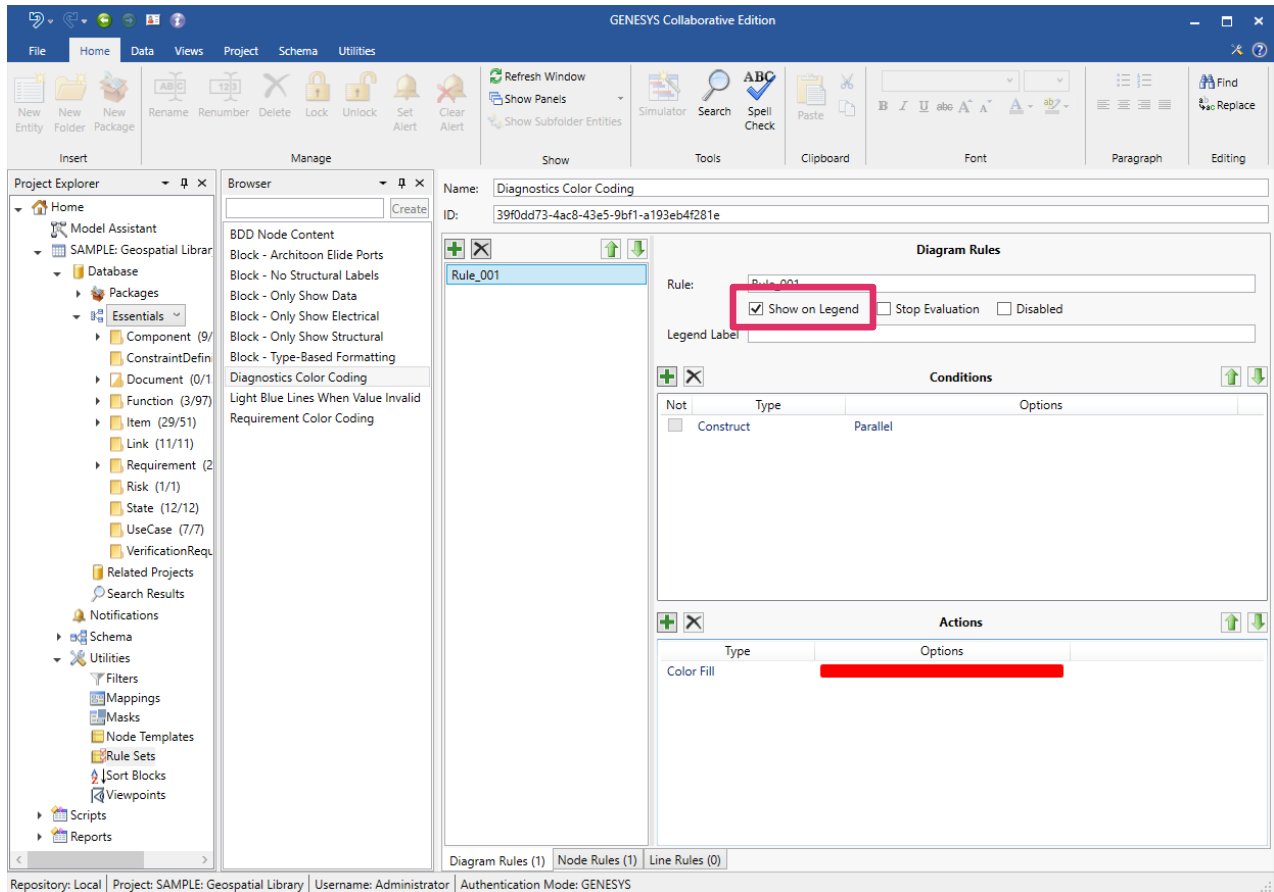


By default, the legend is placed on the bottom right side of the diagram. However, you can re-position it by selecting another option (bottom left, floating, top left, or top right) from the Dock Legend drop-down list in the Properties tab of the diagram Toolbox. You can also drag-drop the legend at any place on the diagram.

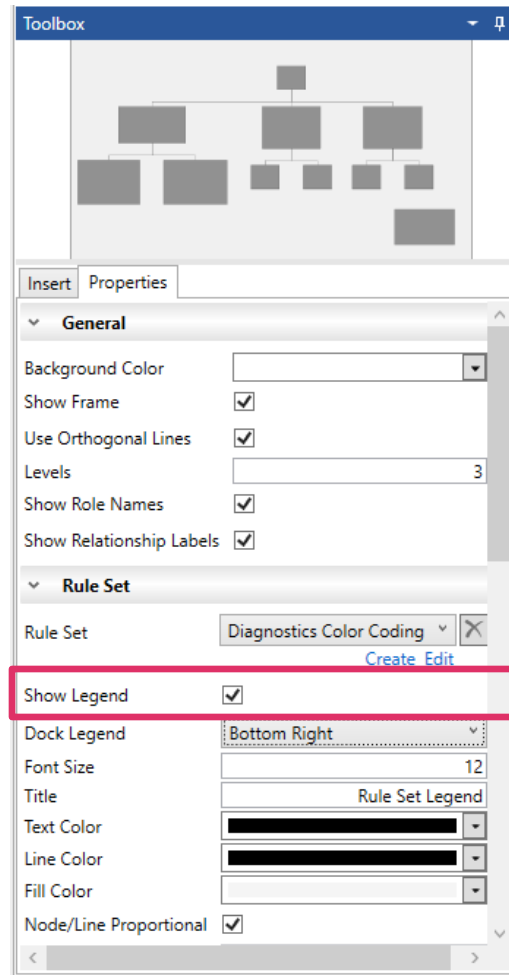


There is also the ability for you to set many other properties of the rule set legend in the Properties tab of the diagram Toolbox or Project Preferences, including font size, text/line/fill color, node/line/label width, and node height. Additional options include adding a title to the legend, making the labels the same width as the nodes, and proportionally sizing the nodes and lines. Plus, the local settings in the Toolbox override the global settings in Project Preferences.

To add a rule set legend to a diagram, the *Show on Legend* option must be selected for each rule that should be included, when creating the associated rule set.

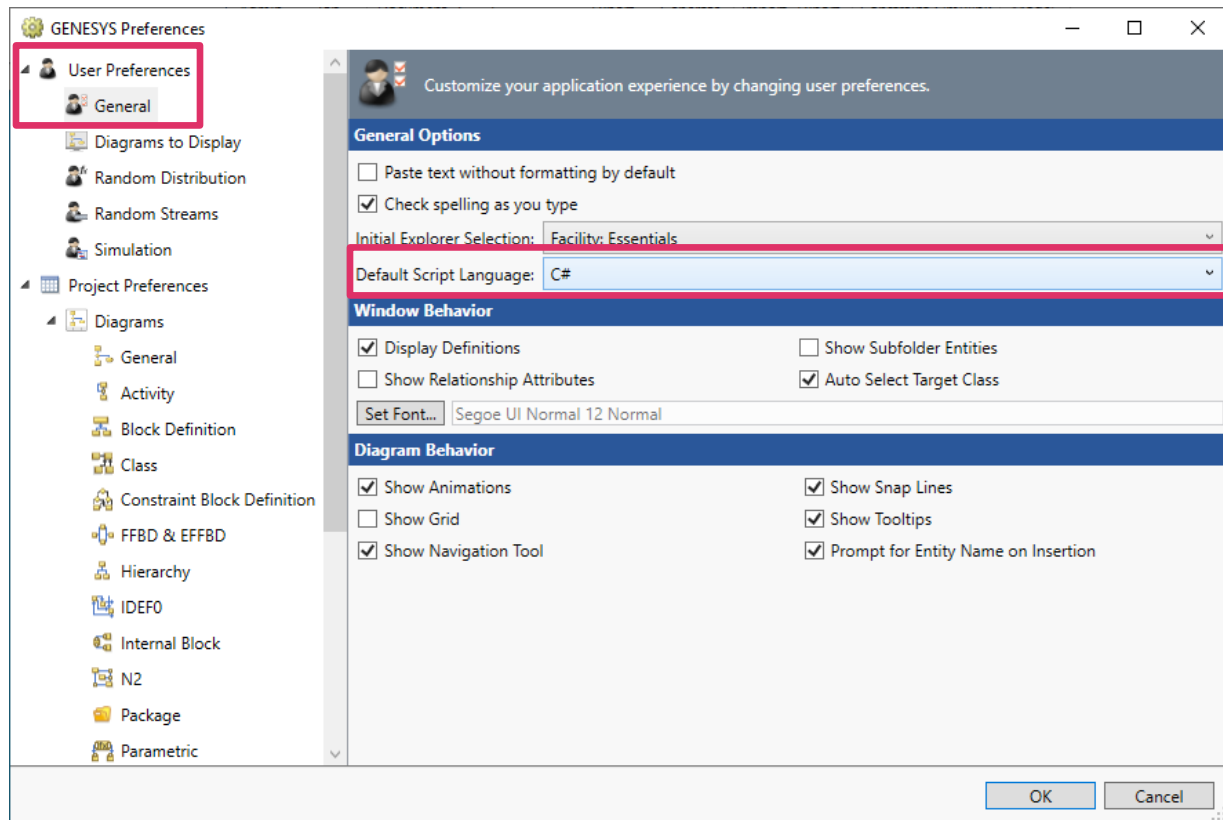


The *Show Legend* option must also be selected in the diagram *Toolbox Properties*, as shown below.



C# SCRIPTING SUPPORT

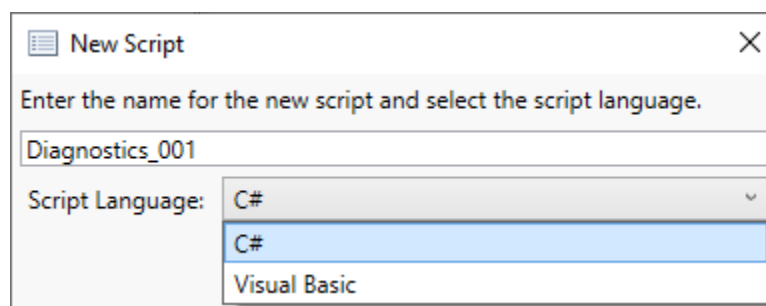
One of GENESYS's key benefits is its ability to extend its functionality via scripting. In addition to Visual Basic, C# scripting is now supported. The default scripting language is set in User Preferences under the General category by selecting an option from the Default Script Language drop-down list.



You can select the language in the GENESYS 2022 release when creating a new script.



On the *Utilities* tab, simply choose the **Scripts** icon, *New Script*, and then select the language from the **Script Language** drop-down list. This will override the default script language set in *User Preferences*.

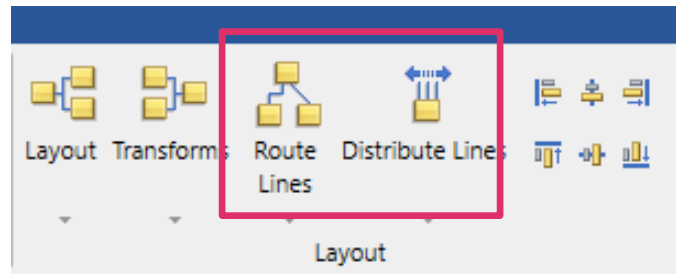


ENHANCEMENTS

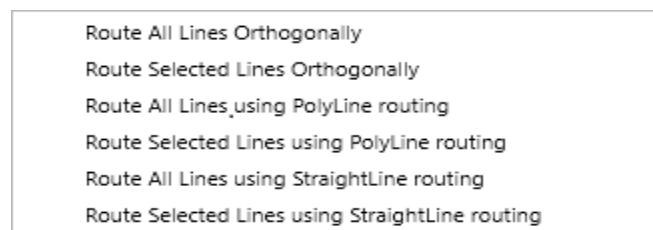
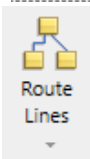
DIAGRAM ENHANCEMENTS

Strong visualizations are essential to effective communications. Diagrams that are neat, clear, and well-organized are easier to understand than those suffering from layout issues. All of the free-form diagrams (physical, internal, flow, interface, state transition, spider, parametric, and class block) have the following enhancements:

- Route lines and distribute lines commands added to the *Layout* section of the *Diagram* ribbon.



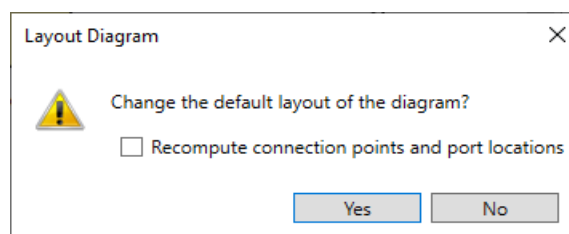
- Route Lines** icon added on the *Diagram* ribbon. This promotes the drop-down menu containing three route line options (routing orthogonally, polyline, or straightline), which were previously available under the *Transforms* icon. This makes these commands more visible and accessible.

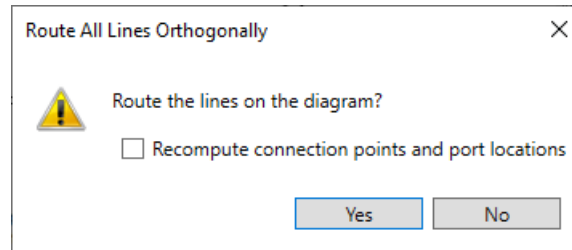


Each of the three options can be applied to all the lines in the diagram or selected lines.

- Recompute connection points and port locations** options have been added to the *Layout* and *Route Lines* options.

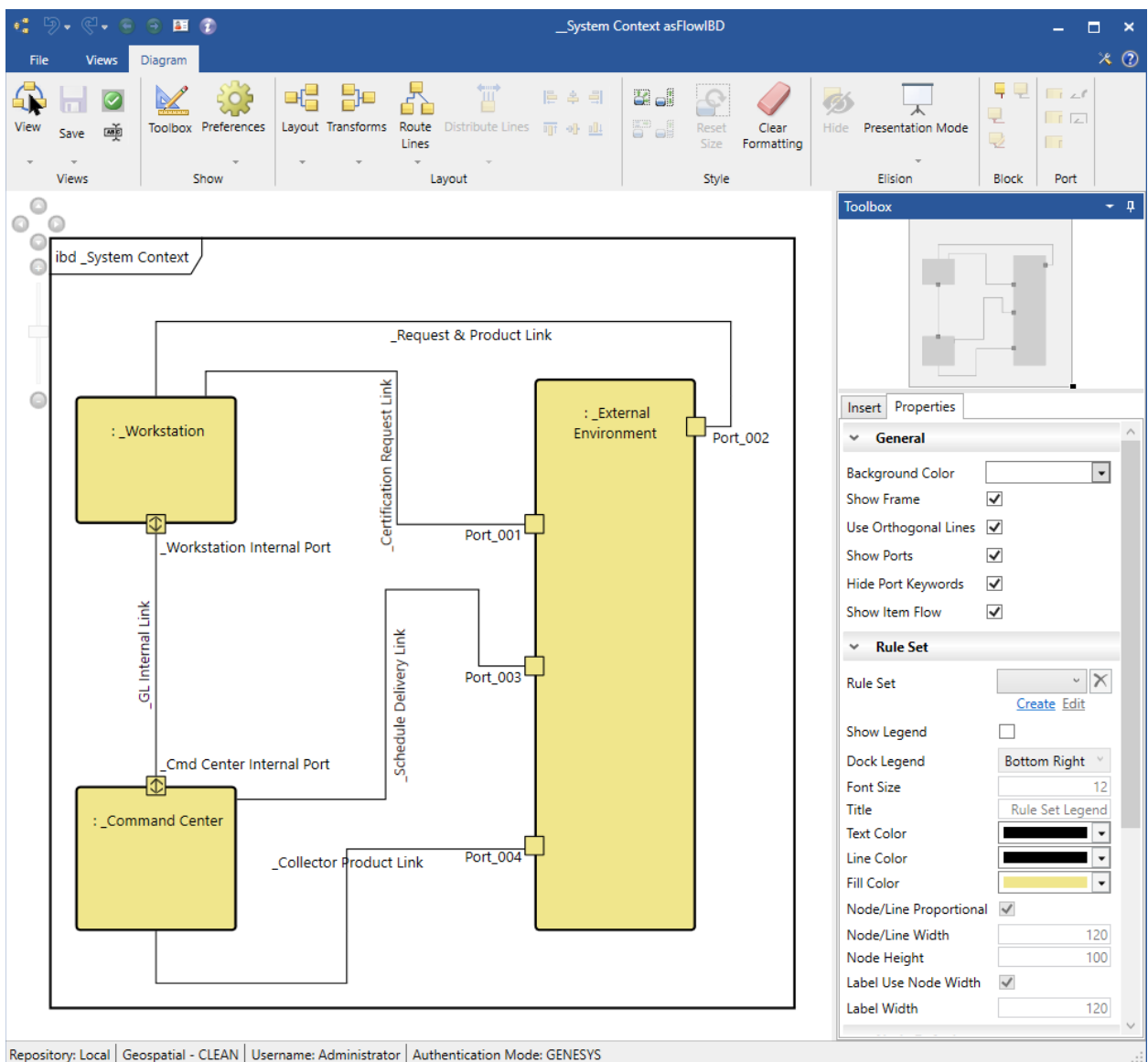
When selecting the *Layout* and each of the *Route Lines* options, users can now select an option to recompute the connection points and port locations, at the dialog box that displays.



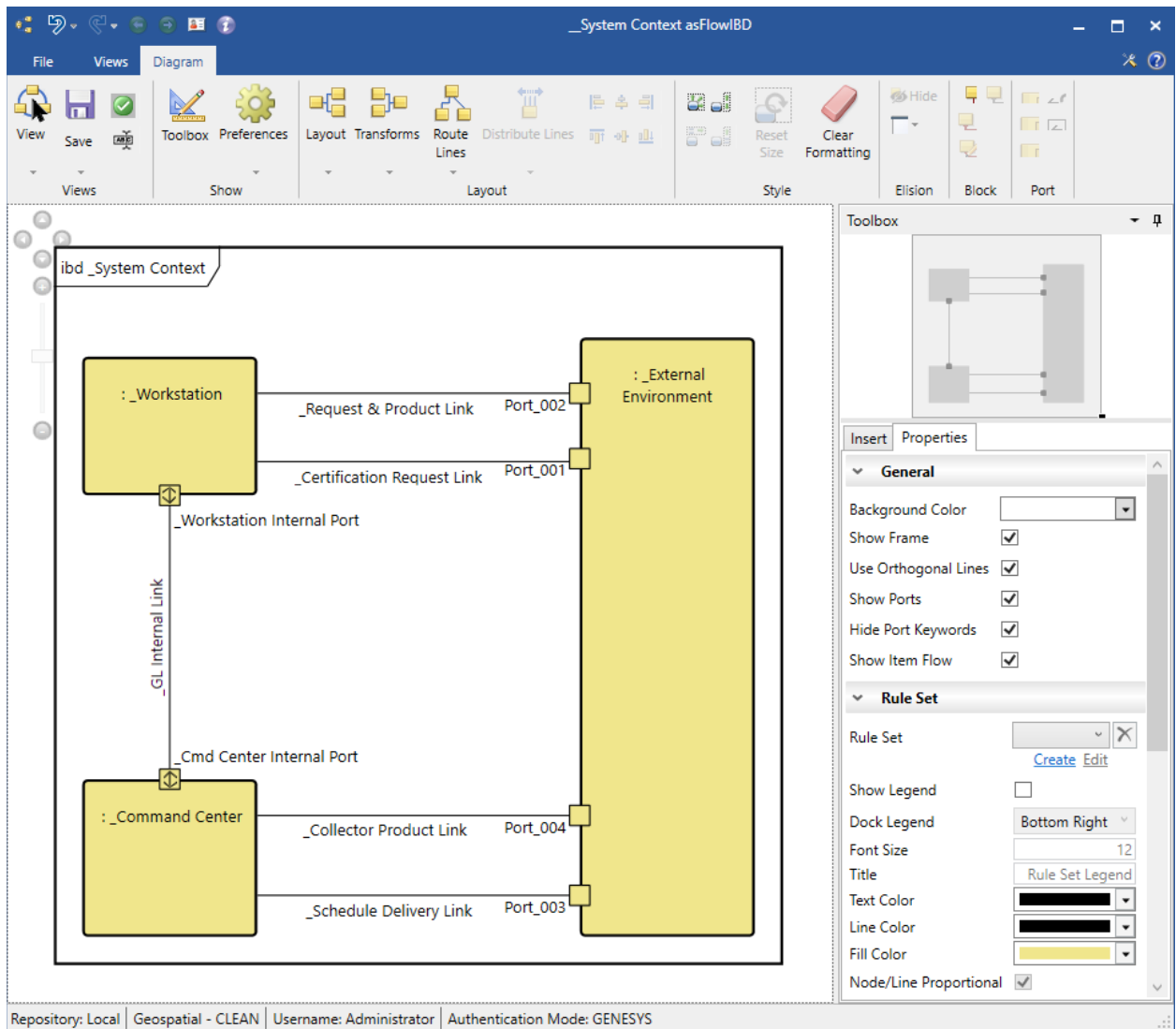


When the **Recompute connection points and port locations** option is checked, the layout algorithm will reposition the points where lines connect to nodes in the diagram to optimize the routing of the lines. Likewise, simple port nodes will also be repositioned to optimize the line routing.

Route All Lines Orthogonally with Recompute (Before)

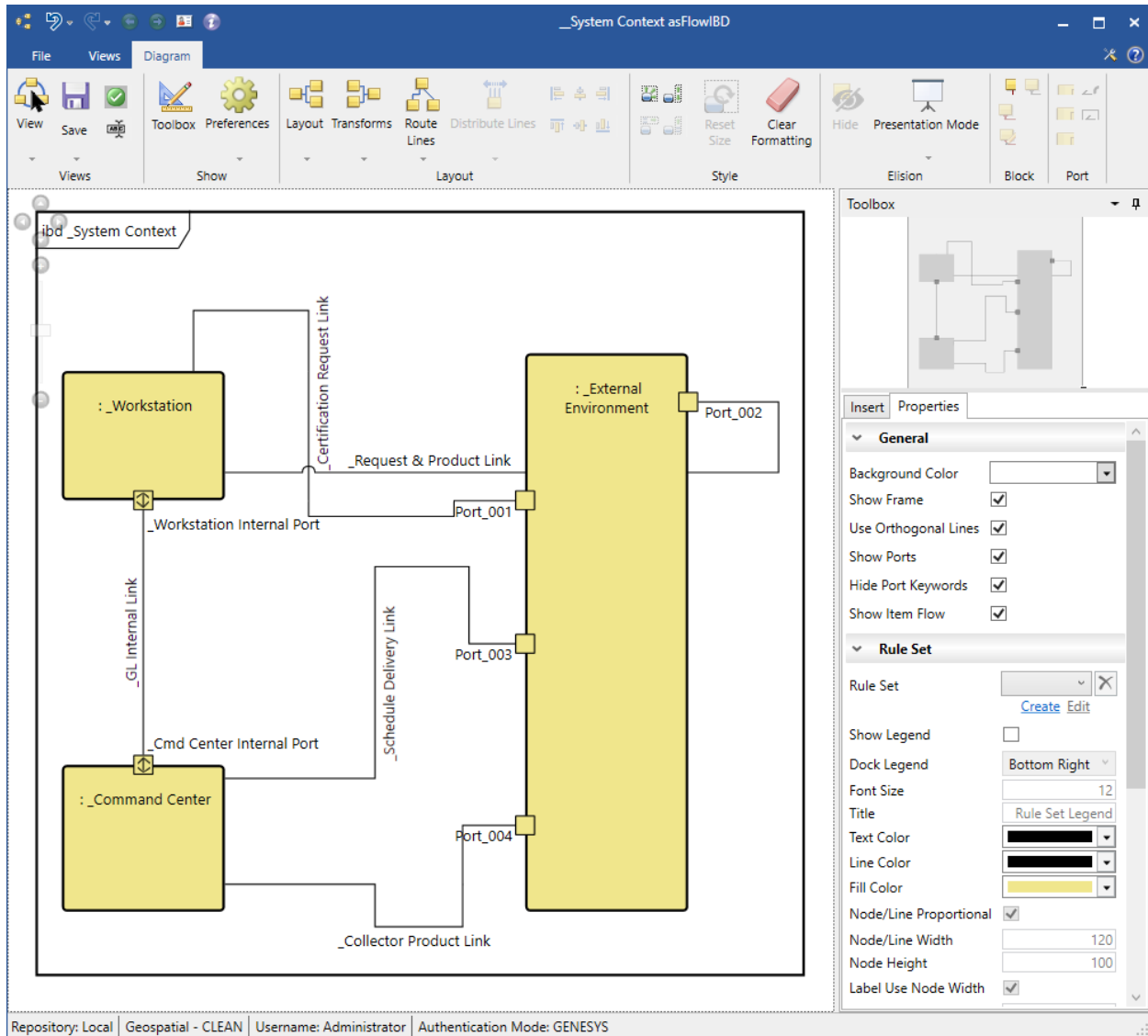


Route All Lines Orthogonally with Recompute (After)

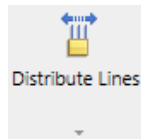
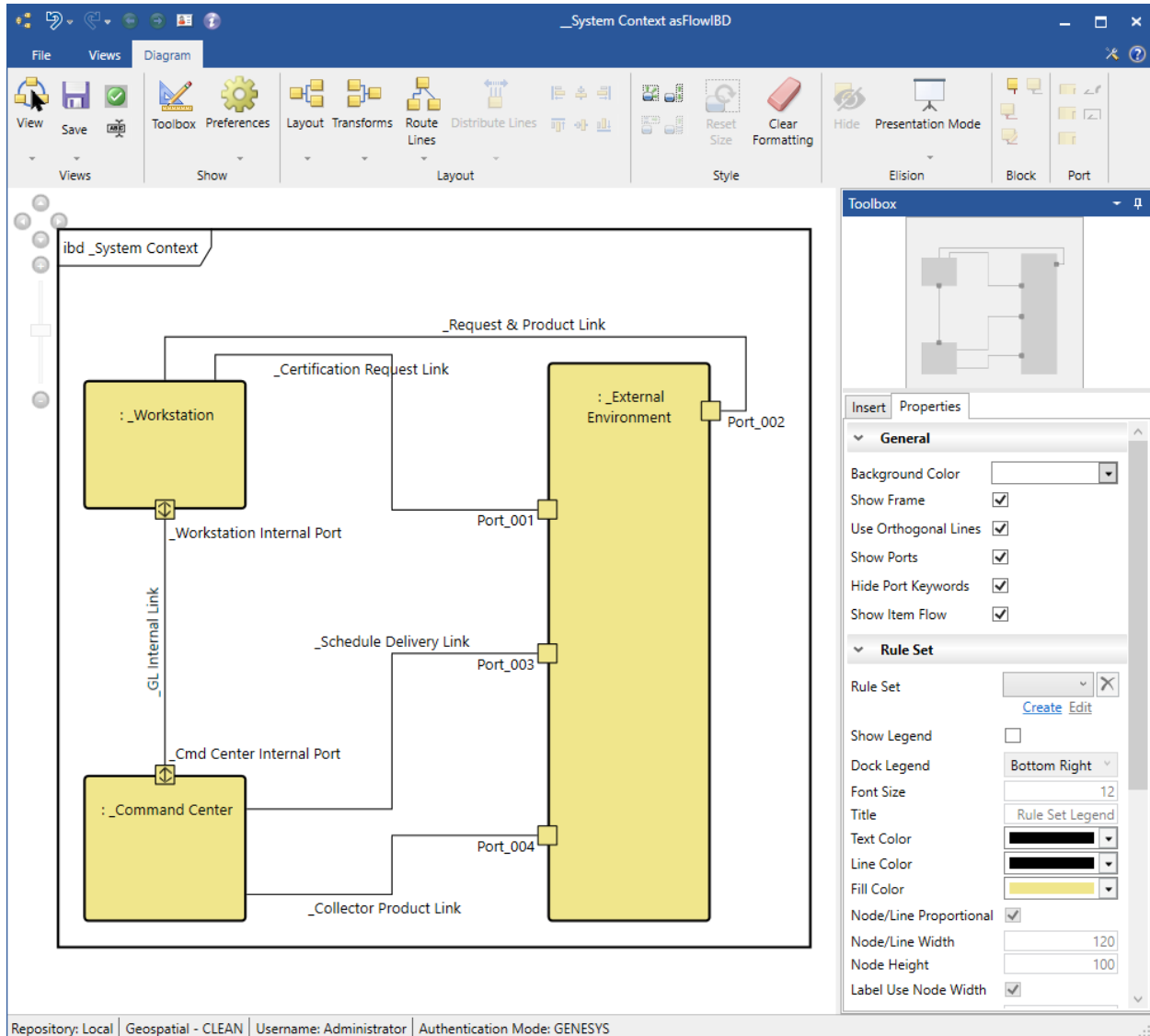


When the **Recompute connection points and port locations** option is not checked, the layout algorithm will maintain the points where lines connect to nodes in the diagram. The position of port nodes will also be maintained.

Route All Lines Orthogonally without Recompute (Before)



Route All Lines Orthogonally without Recompute (After)

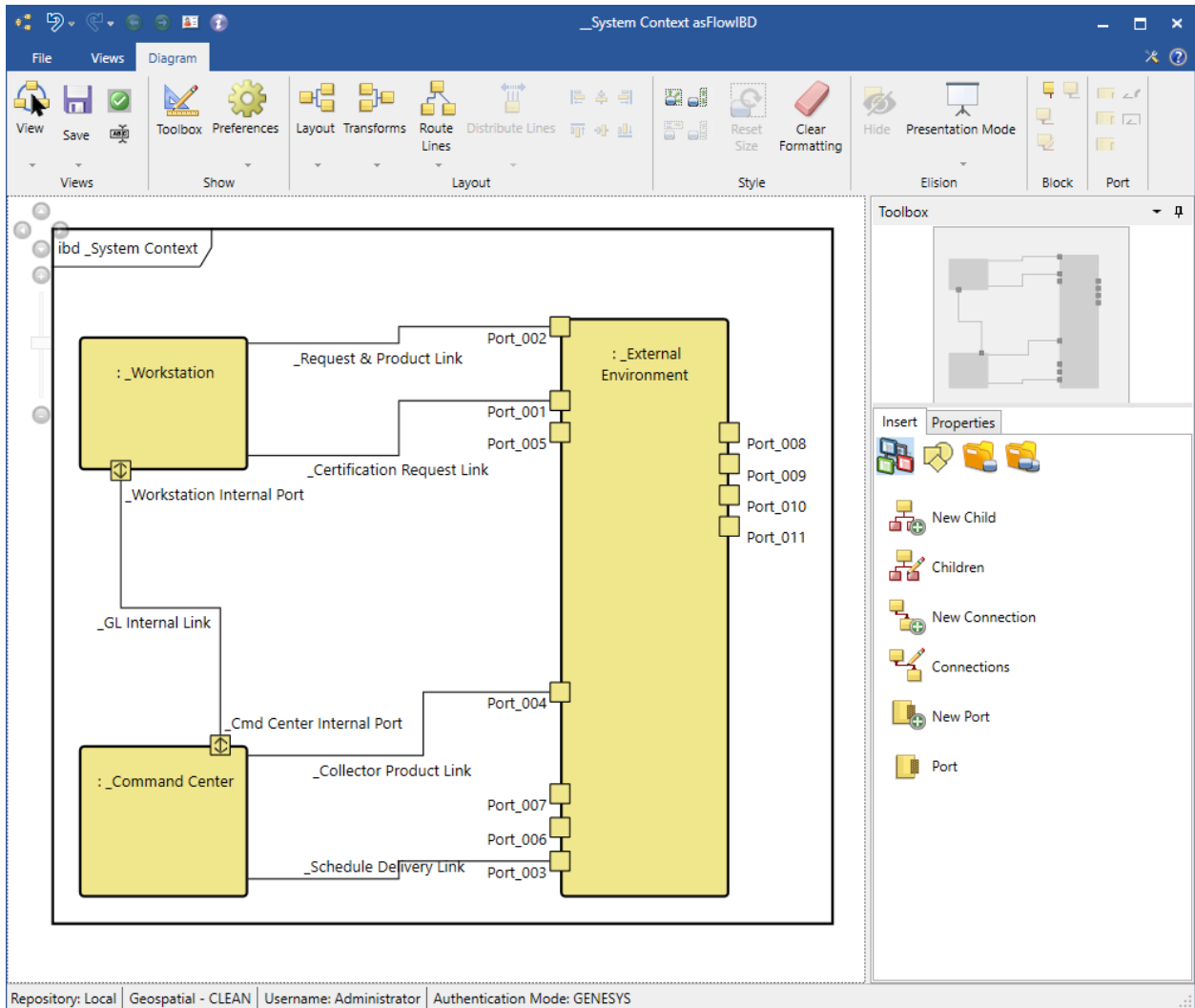


- Distribute Lines** icon has been added to the *Diagram* ribbon. When selected, it evenly distributes all the node connections on selected nodes in the diagram. You can also click the arrow on the bottom of the icon to access a drop-down menu that contains options for evenly distributing node connections individually on any of the four faces (sides) of the selected nodes.

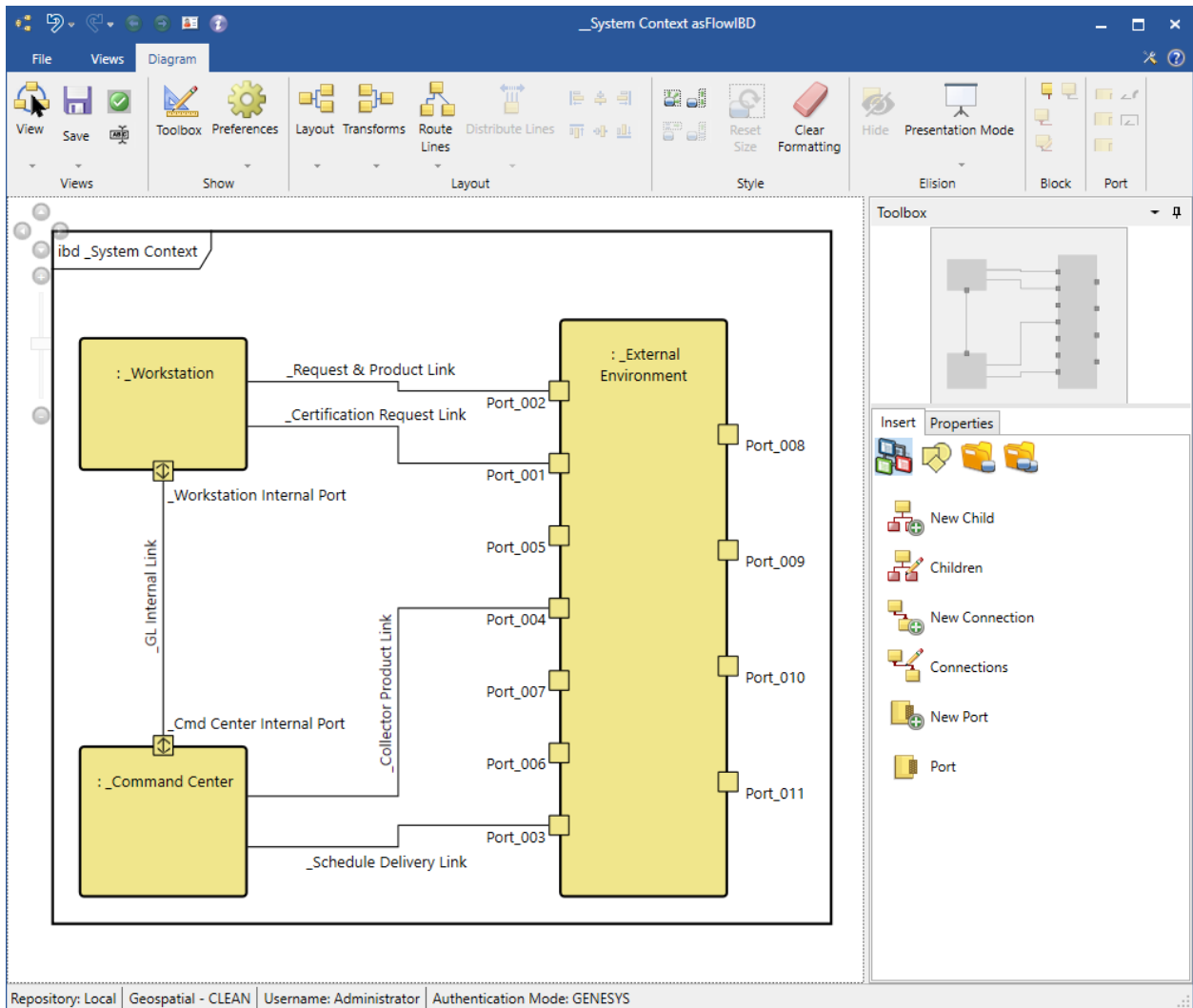
Left Face
Right Face
Top Face
Bottom Face

This feature also distributes port nodes on the diagram. The following example shows the application of *Distribute Lines* when applied to all nodes on the diagram.

Distribute Lines (Before)



Distribute Lines (After)



- Port nodes are now considered anchored immediately after being added to a node on the diagram. They will no longer move to a new default location when new ports are added to the node. This prevents tedious rework as the layout of all connected lines was previously impacted. The new ports will be placed where there is open space on the left and right sides of the node to which the port is being added.
- Lines connected to port nodes will now exit the port away from the node on which the port resides. The diagram will also attempt to maintain this behavior as you move port nodes and nodes containing ports. This helps prevent tedious work to achieve an aesthetically pleasing diagram.

- Line labels can now be positioned at any location along the line rather than having a fixed set of candidate positions. This greatly improves the precision of the label locations.
- Refined the spacing to prevent overlapping nodes when applying layouts.

MODEL ASSISTANT RULES EXPANSION

The Model Assistant provides selectable STRATA methodology implementation rules, which, when selected, result in time savings and additional built-in consistency. For this latest GENESYS release, the model assistant rules have been expanded to enable users to easily flow through related concepts and levels of abstraction by further connecting behavior to use cases and states.

New Use Case Rules

- An Auto-create Primary Function for Use Cases rule has been added. When enabled, it automatically creates a primary function when you create a use case or use case subclass. This rule also creates an elaborated by relationship between the use case and the primary function.
- Another new rule added is Show Primary Function Views for Use Cases. This rule directly opens logical and behavioral views for use cases and use case subclasses when enabled. The view tabs for the diagrams appear at the bottom of the PropertySheet window, and the views are enabled on the Views ribbon.

New State Rules

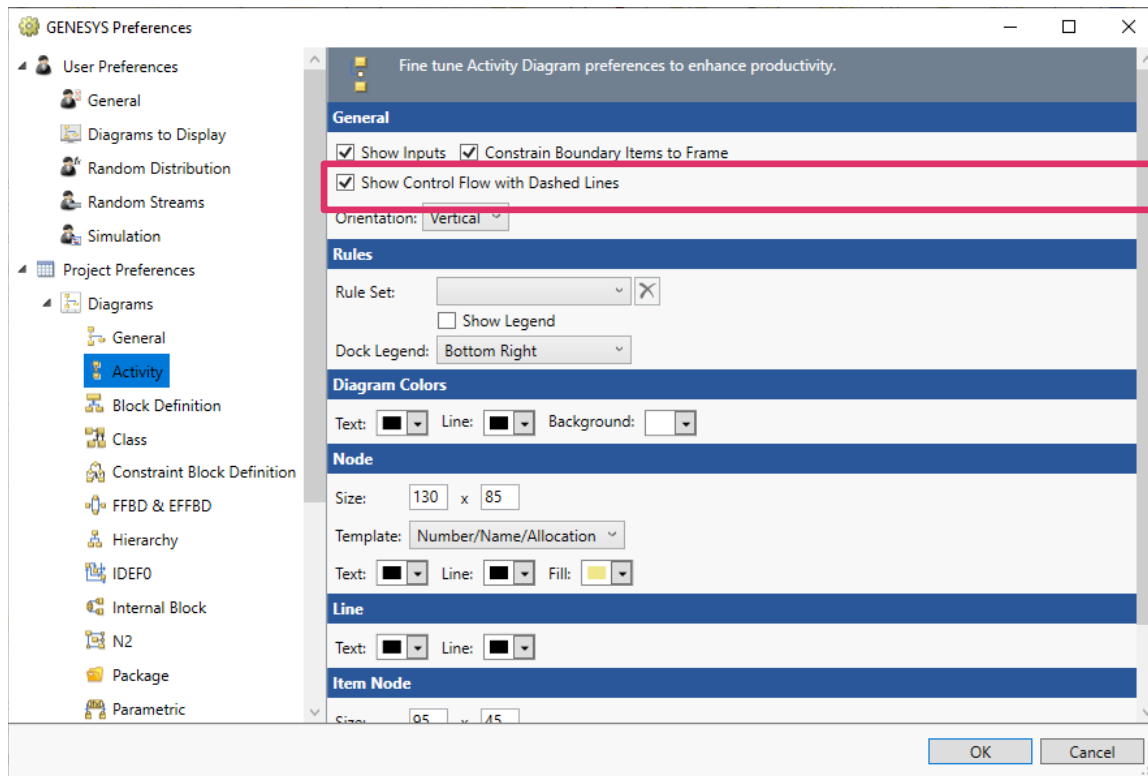
- Additionally, we added the new rule Auto-Create Root Function for States that creates a root function whenever you create a state when enabled. It also creates an incorporates relationship between the state and the root function.
- Also new is the Show Root Function Views for States rule that directly opens logical views for state and state subclasses when enabled.

ADDITIONAL FLOW LINE OPTIONS FOR ACTIVITY DIAGRAMS

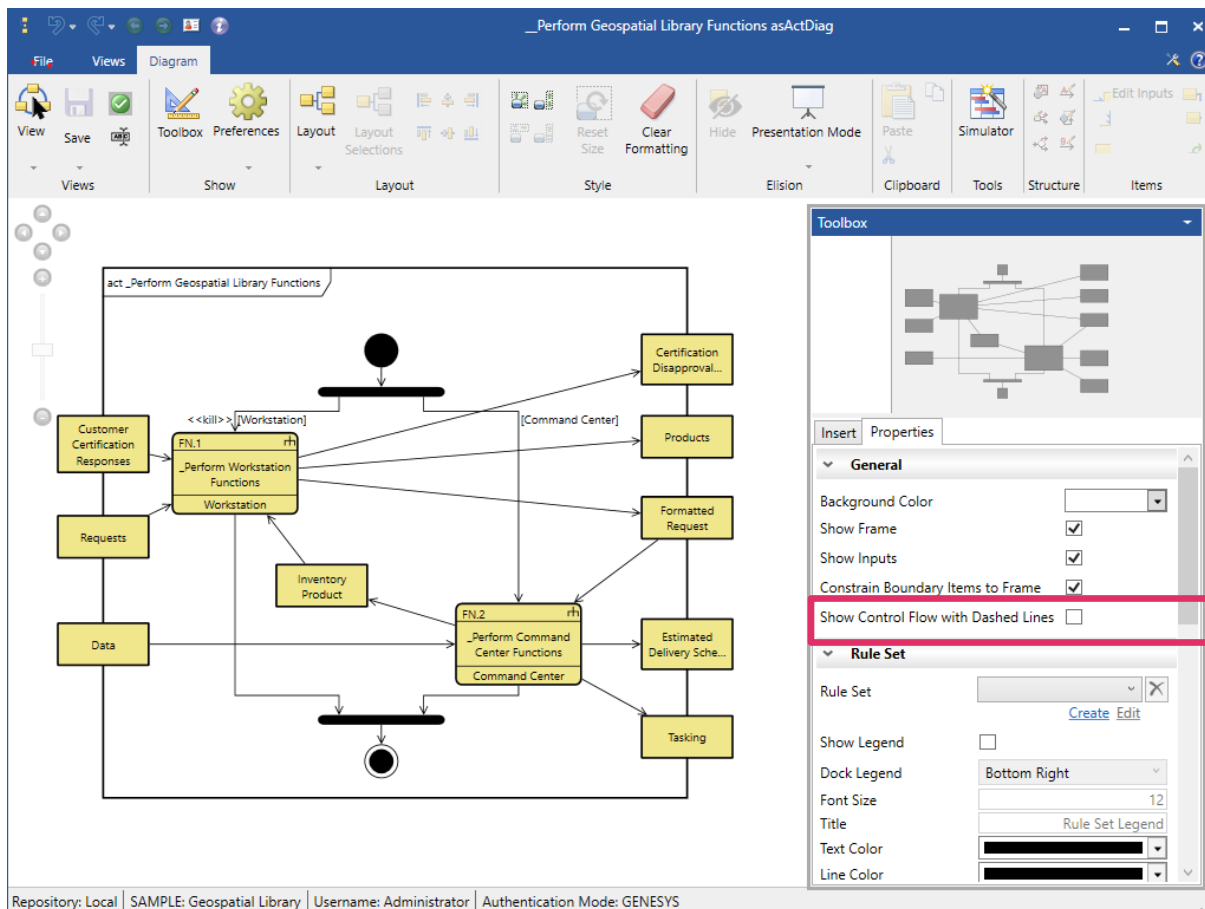
Conformance to the SysML standard in the visual representation of the GENESYS Activity Diagram is key to communicating in environments where SysML has been chosen as the standard modeling language. Additional flow line options for Activity diagrams have been added to align with SysML v1 control flow and object flow notation, including:

- Flow lines can now appear as dashed lines (to represent control flow) in addition to solid lines (to represent object flow).
- You have the option to revert between dashed and solid lines.
- Arrowheads on flow lines are now open-ended like standard industry SysML v1 *Activity* diagrams.

By default, the flow lines appear as dashed lines. Now you can change the default setting that globally applies to all diagrams in Project Preferences. You can also locally override this setting in the diagram Toolbox Properties to apply only to the current diagram. In Project Preferences, select the option Show Control Flow with Dashed Lines under the Activity diagram to show dashed lines.



In the *Toolbox Properties*, select the option *Show Control Flow with Dashed Lines* to show dashed lines.



UNDO/REDO FOR ACTIONS ON DIAGRAMS

Actions for all diagrams can now be undone and redone, saving a tremendous amount of time fixing diagrams.

Any action that changes the state of the diagram can be undone and redone. This includes layout changes like changing colors and sizes of nodes and moving items on the diagram. It also includes database transactions like creating and deleting entities, relationships, and attributes on the diagrams.

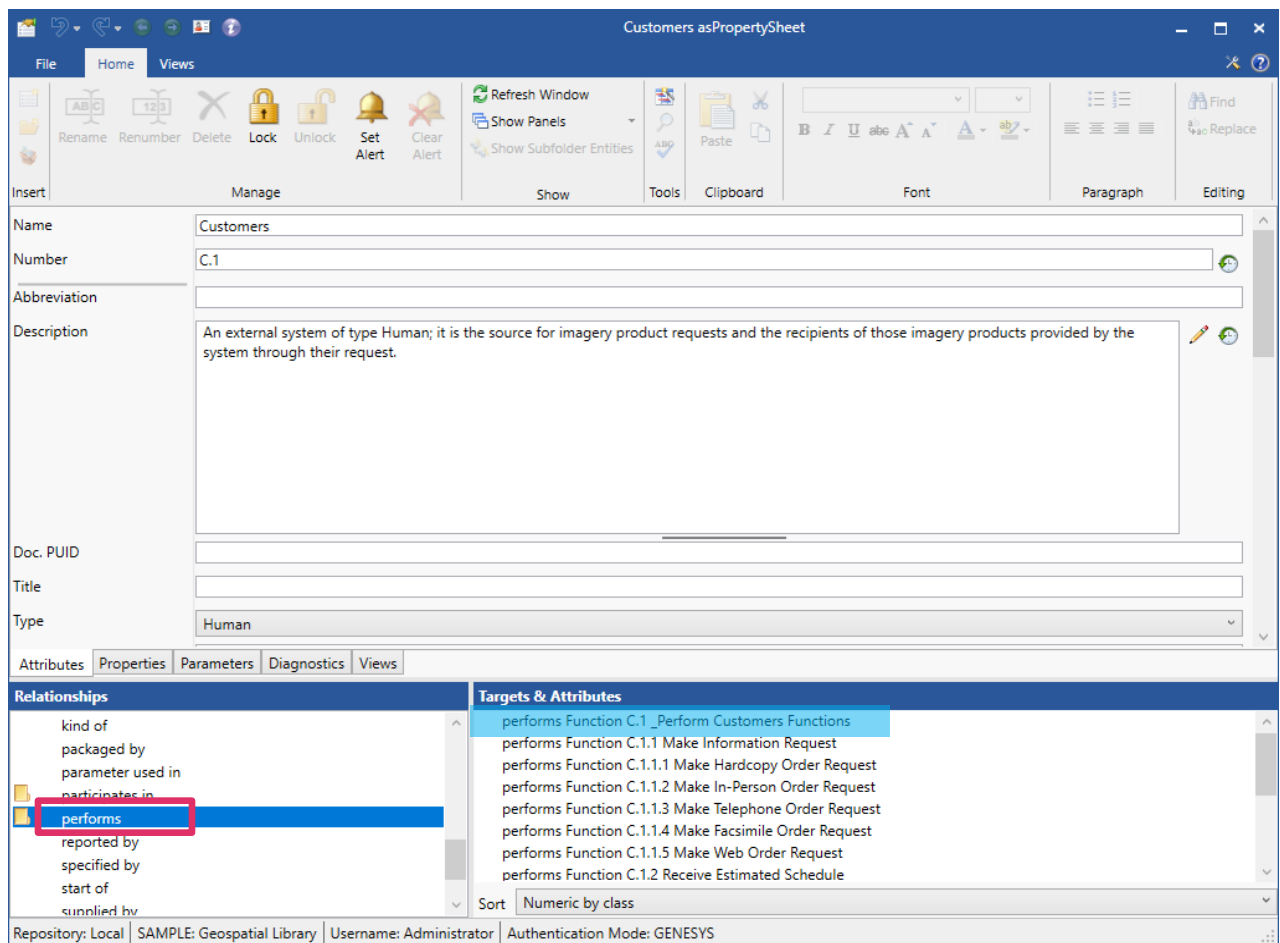
Nested ports can also be undone/redone on Flow IBD diagrams.

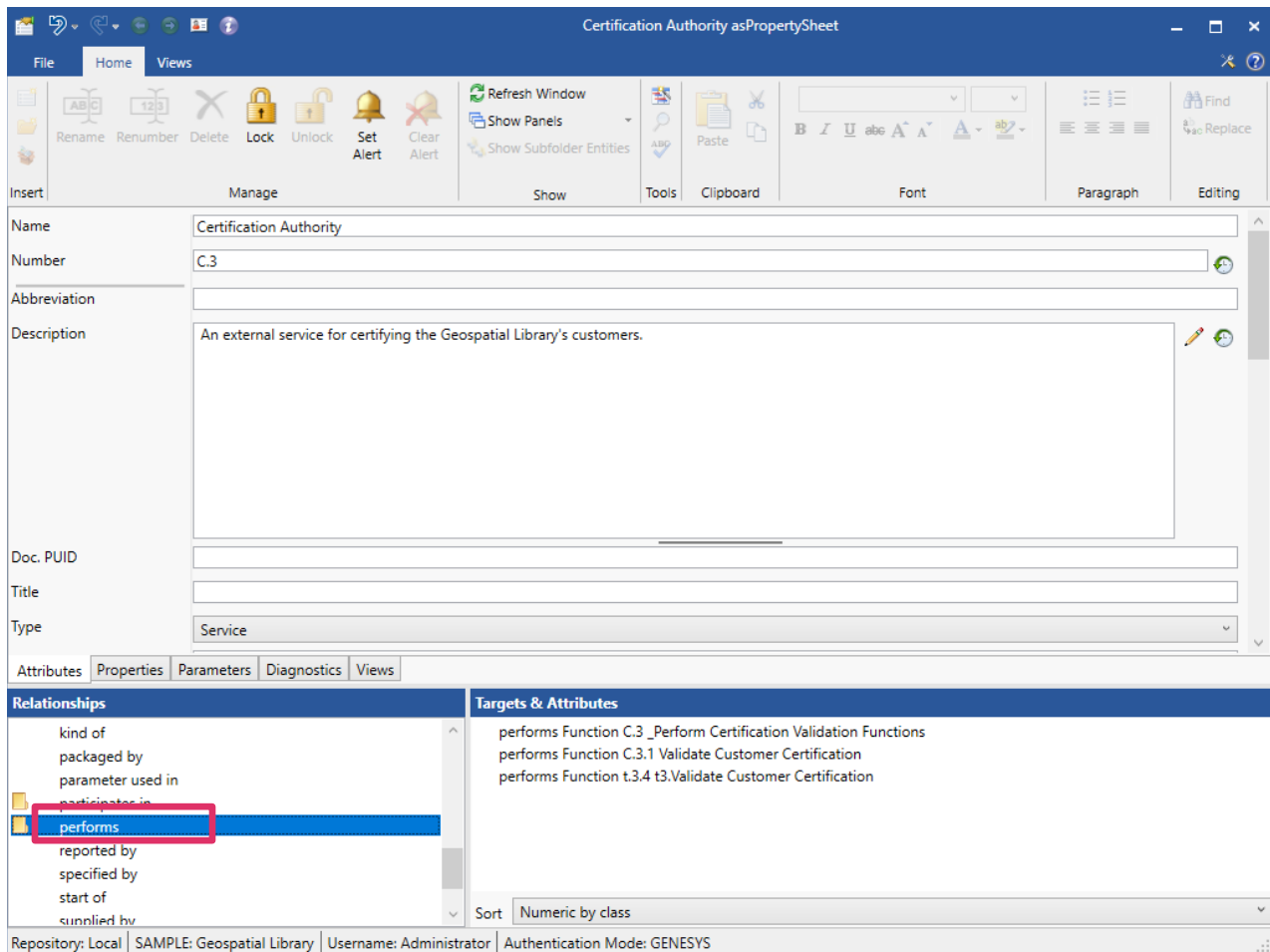
DRAG-DROP RELATIONSHIP TARGETS BETWEEN PROPERTY SHEETS OF THE SAME CLASS ENTITIES FUNCTIONALITY

Additional functionality has been added to drag-drop relationship targets between property sheets of the same class entities.

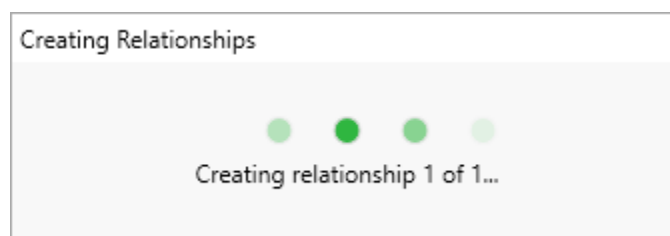
You must open two entity property sheets from the same class and select the same relationship folder on both property sheets.

The example below shows the Customers and Certification Authority entity property sheets from the same Component class. In both property sheets, we selected the performs relationship folder.

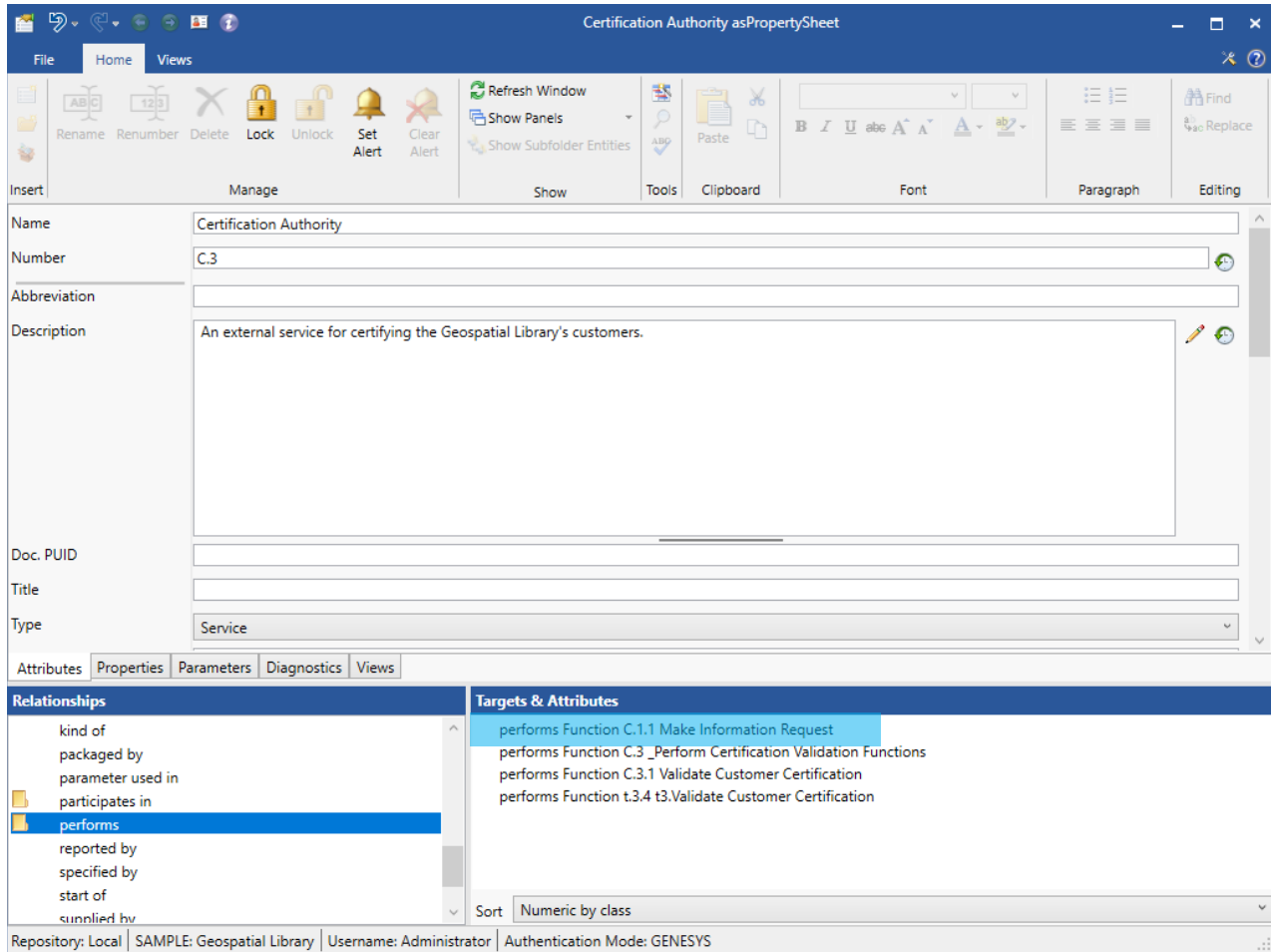




Now when you drag-drop the target relationship Make Information Request from the Targets & Attributes pane of the Customers property sheet onto the perform folder in the Relationships pane of the Certification Authority property sheet, a message displays that GENESYS 2022 is creating the new relationship.



When processing is finished, the new target relationship appears in the Targets & Attributes pane of the destination property sheet, as shown below.



NOTE: The above example showing a simple drag-drop operation, copied the relationship target and added it to the target entity. Holding down the **SELECT** key while performing this operation will remove the target from the source entity, move it and add it to the target entity.

SCHEMA UPDATE: VERIFICATION ACTIVITY SUPERCEDES TEST ACTIVITY

Updates have been made to the System Definition Language to better reflect the scope of verification activities. The Test Activity class has been renamed to Verification Activity to reflect that it can model verification activities for standard methods (test, analysis, demonstration, and inspection) and is not limited to “htest,” as the previous name indicated.

We also removed the “specifies” and “basis of” relationships from the Verification Requirement to the Verification Activity. Replacing them with the “executes” relationship to reflect that the verification activities are executable and transform inputs to outputs. And we added the relationship “generates” a Concern or Risk.

The attributes have been updated to provide tight alignment with external third-party verification execution and project management tools, and in addition, we renamed and updated several attributes (Type is now Responsible Party; Start Date is now Planned Start Date; End Date is now Planned End Date; Completion Criteria is now Expected Result, and Prerequisite is now Preconditions). Additional new attributes are Actual Start Date, Actual End Date, PostConditions, Type (enumeration list: Verification Step; Verification Case; Verification Plan; Verification Campaign), Actual Result, and Status (enumeration list: Proposed; Baselined; Passed; Failed; Blocked; and Deferred).

Test Activity						Verification Activity					
Description: A TestActivity is an action performed in fulfilling the testing objectives of a program entity. It						Description: A VerificationActivity is an action performed in fulfilling the verification objectives of a program entity. It also transforms one or more					
Attribute Alias	Attribute Description	Attribute Type	Enums	Initial Value	Mapping	Attribute Alias	Attribute Name	Attribute Description	Attribute Type	Enums	Initial Value
Name	The name of the entity.	String			↔	Name	name	The name of the entity.	String		
Number	Number is the (ordinal) number, expressed in cells and using periods as separators, used to identify the entity's place in a hierarchy.	Hierarchical Number			↔	Number	number	Number is the (ordinal) number, expressed in cells and using periods as separators, used to identify the entity's place in a hierarchy.	Hierarchical Number		
Description	Description is the written statement of this entity.	Text			↔	Description	description	Description is the written statement of this entity.	Text		
Title	Title is the label to be used in formal documentation instead of the entity name.	String			↔	Title	title	Title is the label to be used in formal documentation instead of the entity name.	String		
Behavior Type	Behavior Type describes the nature of the unit and the role it plays in the design/ specification process.	Enumeration	Integrated	Standard	↔	Behavior Type	behaviorType	Behavior Type describes the nature of the unit and the role it plays in the design/ specification process.	Enumeration	Integrated	Standard
Type	Type distinguishes between formal (sponsor) and informal (contractor) testing.	Enumeration	Contractor	nil	→	Responsible Party	responsibleParty	The Responsible Party is the organization, team, group, or individual responsible for conducting the Verification Activity.	Enumeration	nil; Project	nil
Duration	Duration is the time that this processing unit takes to complete.	Number Spec			↔	Duration	duration	Duration is the time that this processing unit takes to complete.	Number Spec		
Start Date	Start Date identifies the start date of the entity.	Date			→	Planned Start Date	startDatePlanned	The Planned Start Date identifies the date that the Verification Activity is planned to be initiated.	Date		
					→	Actual Start Date	startDateActual	The Actual Start Date identifies the date at which the Verification Activity was actually initiated.	Date		
End Date	End Date identifies the end date of the entity.	Date			→	Planned End Date	endDatePlanned	The Planned End Date identifies the date that the Verification Activity is planned to be completed.	Date		
					→	Actual End Date	endDateActual	The Actual End Date identifies the date at which the Verification Activity was actually completed.	Date		

Test Activity					Mapping	Verification Activity						
Description: A TestActivity is an action performed in fulfilling the testing objectives of a program entity. It						Description: A VerificationActivity is an action performed in fulfilling the verification objectives of a program entity. It also transforms one or more						
Attribute Alias	Attribute Description	Attribute Type	Enums	Initial Value		Attribute Alias	Attribute Name	Attribute Description	Attribute Type	Enums	Initial Value	
15	Timeout	Timeout is a duration. If it is set, a processing unit that has been enabled but not started for that duration should terminate.	Number Spec			↔	Timeout	timeout	Timeout is a duration. If it is set, a processing unit that has been enabled but not started for that duration should terminate.	Number Spec		
16	Execute Decomposition	Execute Decomposition designates whether or not the decomposition of the entity should be included when performing a dynamic analysis.	Boolean	True, False	TRUE	↔	Execute Decomposition	executeDecomposition	Execute Decomposition designates whether or not the decomposition of the entity should be included when performing a dynamic analysis.	Boolean	True, False	TRUE
17	Log Message	Log Message defines text to be placed in the simulation transcript upon execution of the unit.	String			↔	Log Message	logMessage	Log Message defines text to be placed in the simulation transcript upon execution of the unit.	String		
18	Completion Criteria	Completion Criteria defines completion criteria for a test activity; what constitutes test success.	Text			→	Expected Result	expectedResult	The Expected Result describes the results that are expected if the Verification Activity executes as anticipated. Depending on the type of Verification Activity, this could include documentation of expected minimum performance value(s) for a test, observed behavior for a demonstration, and/or expected messages for software or communications tests.	Text		
19	Prerequisite	Describes the entrance criteria for the test activity.	Text			→	Preconditions	preconditions	Preconditions are the conditions that must hold true for the Verification Activity to begin.	Text		
20						→	Postconditions	postconditions	Postconditions are the conditions that must hold true once this Verification Activity has completed.	Text		
21	Special Comments	Describes any unique constraints of the test activity.	Text			→	Special Comments	specialComments	Special Comments describe any unique constraints of the Verification Activity.	Text		
22	Begin Logic	Begin Logic contains a script that is executed at the very beginning of function execution (after enablement and triggering but before resources are acquired).	Script Spec			↔	Begin Logic	beginLogic	Begin Logic contains a script that is executed at the very beginning of function execution (after enablement and triggering but before resources are acquired).	Script Spec		
23	Exit Logic	Exit Logic contains a script that determines which exit to use for a multi-exit function. If the exit logic is empty, the probabilities associated with the exits are used to choose the exit.	Script Spec			↔	Exit Logic	exitLogic	Exit Logic contains a script that determines which exit to use for a multi-exit function. If the exit logic is empty, the probabilities associated with the exits are used to choose the exit.	Script Spec		
24	End Logic	End Logic contains the script that is executed at the very end of functional execution (after resources are produced and items are output).	Script Spec			↔	End Logic	endLogic	End Logic contains the script that is executed at the very end of functional execution (after resources are produced and items are output).	Script Spec		
25						→	Type	type	Type distinguishes the level of decomposition of the Verification Activity for planning purposes.	Enumeration	nil; Verification Step; Verification Case; Verification Plan; Verification Campaign	nil
26						→	Actual Result	actualResult	The Actual Result captures the observed results of the verification activity after it has been executed and completed.	Text		
27						→	Status	status	Defines the current state or status of the Verification Activity.	Enumeration	nil; Proposed	nil
28						<div>Legend</div> <div>↔ Same in the Original Class and the Updated Class</div> <div>→ Modified in the Updated Class</div> <div>→ New in the Updated Class (did not exist in the Original Class)</div> <div>✗ In the Original Class but does not exist in the Updated Class.</div>						
29												
30												
31												
32												
33												

< >

Attribute Mapping

VA Attribute Ordering

Relationship Changes

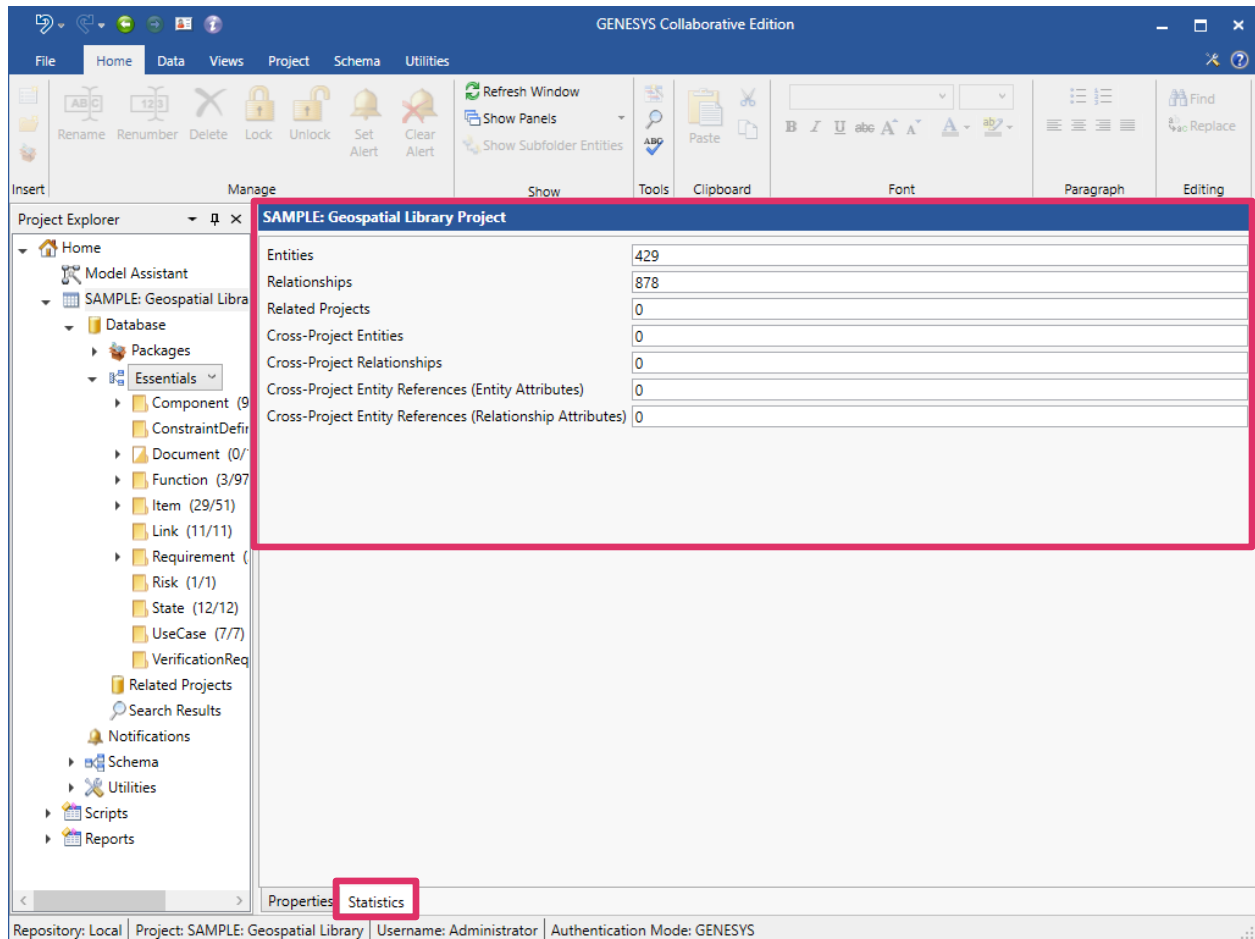
+

:

<

VIEWING PROJECT STATISTICS

GENESYS 2022 users can now view project statistics on the **Statistics** tab of the *Project Properties* screen. These statistics provide valuable information and insight on the size of a project (number of entities, relationships, etc.) and the degree of interconnectivity (cross-project entities, relationships, etc.) with other projects.



SAMPLE: Geospatial Library Project	
Entities	429
Relationships	878
Related Projects	0
Cross-Project Entities	0
Cross-Project Relationships	0
Cross-Project Entity References (Entity Attributes)	0
Cross-Project Entity References (Relationship Attributes)	0

Repository: Local | Project: SAMPLE: Geospatial Library | Username: Administrator | Authentication Mode: GENESYS

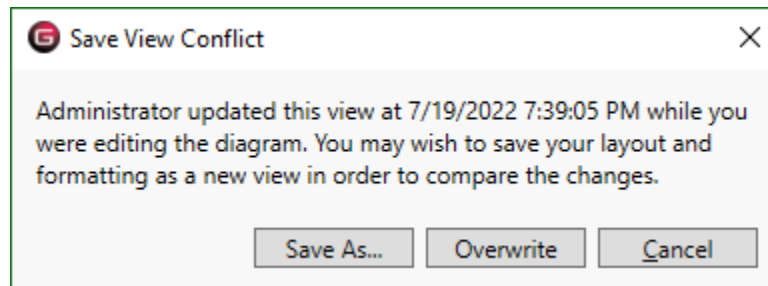
Project statistics include:

- Number of entities in the project
- Number of relationships in the project
- Number of related projects
- Number of cross-project entities
- Number of cross-project relationships
- Number of cross-project entity references (entity attributes)

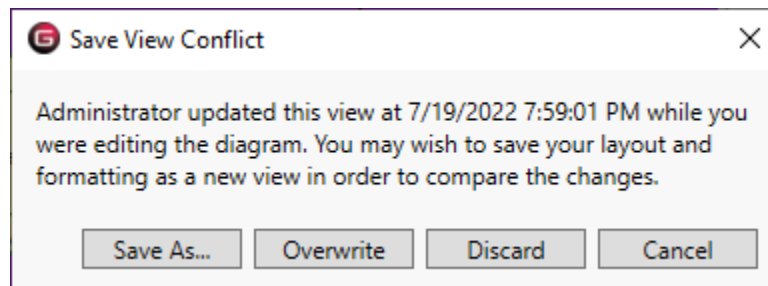
PREVENT ACCIDENTLY OVERWRITING VIEWS

A warning message has been added to prevent accidentally overwriting views. This can happen when two users are working on the same view concurrently or if you have the same view open in multiple windows.

When you attempt to save the diagram, and another window or user saved the view since the diagram was opened, a warning message displays with options to save the diagram as a new view with a different name, overwrite the view, or cancel the changes to the view.



Suppose you attempt to close the diagram window without saving it, and another window or user saved the view since the diagram was opened. In that case, the following warning message displays an additional option to discard the new view.



RDF FEATURE ENHANCEMENT

Enhanced the generate Resource Description Framework (RDF) feature by enabling relationships to be represented as simple predicates. This adds more flexibility to the model and simplifies the representation.

IMPORTING PACKAGES INTO GENESYS

Now in GENESYS 2022, the smart import feature assists you in importing package files by detecting the type of file/package being imported and displaying the appropriate import options.

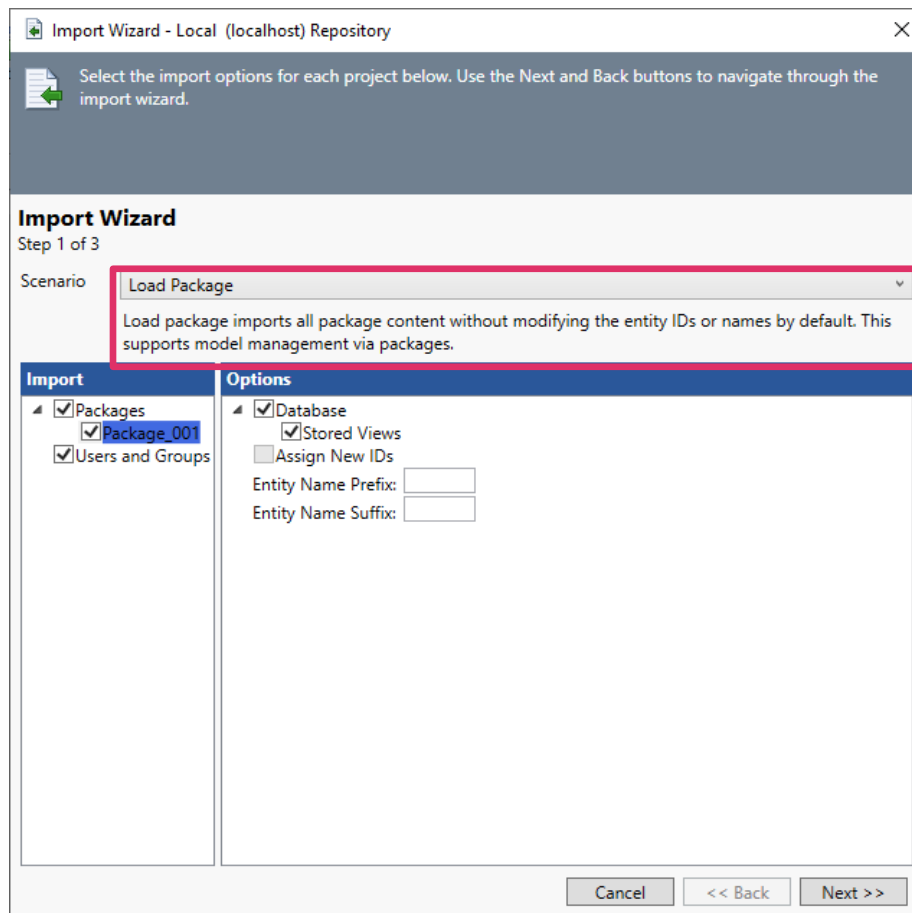
For packages, smart import displays a **Scenario** drop-down list where you can select one of two package import methods.

The **Load Package** option imports all package content without modifying the entity IDs or names. This method supports model management through packages.

The **Instantiate Model Segment** option imports all package content and modifies the entity IDs. This method supports instantiating your project's pattern, part, or other model segments. We highly recommend that you specify an entity name prefix or suffix to differentiate entities instantiated as part of this model segment.

NOTE: The default method is **Load Package**.

To better assist you in selecting the appropriate import method, a description of the option now appears on the window when you select one of the options, as shown below.



Import Wizard - Local (localhost) Repository

Select the import options for each project below. Use the Next and Back buttons to navigate through the import wizard.

Import Wizard
Step 1 of 3

Scenario: Load Package
Load package imports all package content without modifying the entity IDs or names by default. This supports model management via packages.

Import

- ☒ Packages
 - ☒ Package_001
- ☒ Users and Groups

Options

- ☒ Database
 - ☒ Stored Views
 - ☐ Assign New IDs
 - Entity Name Prefix:
 - Entity Name Suffix:

Cancel << Back Next >>

Import Wizard - Local (localhost) Repository

Select the import options for each project below. Use the Next and Back buttons to navigate through the import wizard.

Import Wizard

Step 1 of 3

Scenario: **Instantiate Model Segment**

Instantiate model segment imports all package content modifying the entity IDs by default. This supports instantiating a pattern, part, or other model segment for use in your project. It is highly recommended that an entity name prefix or suffix be specified to help differentiate entities instantiated as part of this model segment.

Import	Options
<input checked="" type="checkbox"/> Packages <input checked="" type="checkbox"/> Package_001 <input checked="" type="checkbox"/> Users and Groups	<input checked="" type="checkbox"/> Database <input checked="" type="checkbox"/> Stored Views <input checked="" type="checkbox"/> Assign New IDs Entity Name Prefix: <input type="text"/> Entity Name Suffix: <input type="text"/>

Cancel << Back Next >>

Now when the import process completes, the Job Monitor window displays.

Job Monitor

View existing jobs and their status. Use the Purge button to delete all your completed jobs from the repository.

Repository: Local (localhost)

Job Type	Owner	Status	Conflicts	Message	Submitted	Startec
Import	Administrator	Finished	False		6/22/2022 5:08:03 PM	6/22/2022 5:08:03 PM
Import	Administrator	Finished	False		6/20/2022 8:40:41 PM	6/20/2022 8:40:41 PM
Import	Administrator	Finished	False		6/6/2022 5:23:24 PM	6/6/2022 5:23:24 PM
Import	Administrator	Finished	False		5/27/2022 8:47:54 AM	5/27/2022 8:47:54 AM
Import	Administrator	Finished	False		5/26/2022 9:13:18 AM	5/26/2022 9:13:18 AM
Import	Administrator	Finished	False		5/25/2022 9:07:42 AM	5/25/2022 9:07:42 AM
Import	Administrator	Finished	False		5/24/2022 10:30:53 AM	5/24/2022 10:30:53 AM
Import	Administrator	Finished	False		5/20/2022 2:58:06 PM	5/20/2022 2:58:06 PM
Import	Administrator	Finished	False		5/20/2022 2:57:42 PM	5/20/2022 2:57:42 PM

Show: ☒ Running ☒ Waiting ☒ Finished ☒ Aborted

Purge Close

The third column on the *Job Monitor* indicates “Finished” if the import has completed.

The fifth column on the *Job Monitor* states “True” or “False” to indicate if any conflicts occurred during the import process.

PERFORMANCE ENHANCEMENTS

SOFTWARE PERFORMANCE ENHANCEMENTS

Software performance has been enhanced, improving user experience in both single and Multi-user scenarios.

Performance enhancements include:

- Project and diagram load times have been significantly reduced
- GENESYS GUI and server communication has been improved by up to 50%
- Schema and queries are processing more efficiently
- Scripts now execute more efficiently when accessing the GENESYS server over a network
- Performance of the Administrative Tools window has been significantly improved, eliminating lag time when managing users and groups

NOTE: GENESYS 2022 supports 64-bit machines and can no longer be installed on 32-bit machines. The application files will now be installed in the 64-bit *Program Files* directory instead of the previous *Program Files (x86)* directory.

RESOLVED ISSUES

Reliability

GENESYS now continues running after the host computer returns from hibernation mode.

Performance

Administrative Tools – When connected to a remote GENESYS server, the application no longer suspends for an extended period of time when managing users and groups.

Connectors

Excel Connector – Inserting new entities in the Excel Connector when the target entity column is empty of data, no longer generates an error.

Data

Minimum and maximum values for integer and float types are now recognized by the GENESYS UI.

Simulation

Simulation execution no longer fails when encountering a replication count exceeding 11.

Diagrams

Free-Form – Connection lines now route properly when nodes overlap or when deleting external nodes.

Internal Block – Connection lines no longer appear inside port nodes and nodes attached to the diagram frame. Also, the *Diagram Toolbox* now accurately reflects user-selected colors in all scenarios.

Constraint BDD – Changes to node properties persist.

Import/Export

During import/export, when the list size exceeds available space, checking the last project in the list no longer fails.

Reports

The default filename for reports now contains the date format specified in the computer's *Regional* settings.

Relationship Targets – The entity filter option has been moved from the *Target* band to the *Relationships* band, providing a mechanism to filter the resulting relationship targets.

IRS Report – The *IRS Report* now runs smoothly when recursive relationships exist in the project data.

TeamView

Hyperlinks for the nodes within the *Use Case* diagrams now link to the appropriate use cases.

TeamView now creates the correct output files when a custom homepage logo exists in the TeamView destination folder or when the active project contains cross-project relationships to another project that does not exist in the repository.

Schema

Users are now able to change the initial value of an enumeration type attribute.

Migration

The project schema migration process now includes DOORS attribute mappings and stored views associated with the *Interface N2*, *Internal Block*, and *Interface Block* diagrams.

University Edition

Licensing – The GENESYS license now works after upgrading to the Windows 11 operating system.

General

Home Dialog – Double-clicking on the project list scroll bar on the GENESYS *Home* page no longer inadvertently opens the selected project.

Date Format – Dates in GENESYS now follow the format of the Windows *Regional* settings.

Local Service – When a user connects to a remote repository, the local GENESYS service will not start. Also, when exiting GENESYS with the option to stop the service selected, the local GENESYS service now stops.

Additional Software Enhancements

Administrative Tools – The dialog window for editing user and group properties is now resizable to facilitate editing many users/groups.

Excel Connector – The *Table Definition Editor* in the Excel Connector is now resizable to accommodate more data.

Project Utilities – The ID assigned to project utilities (e.g., sort blocks, filters, viewpoints, etc.) is now visible on the user interface.

Additional minor issues were resolved and improvements were made throughout the product.