



Thank you for choosing Simio. We are confident that you will be pleased with its power, flexibility, and ease of use. Models can be automatically created from external data and the logic of the model driven by external data. This means that a Simio model becomes a true, agile digital twin when it is connected to your enterprise systems and the data in these systems drive the foundation and logic of the model.

Simio is unique in our ability to support models that span the digital continuum of design to operate, in a single application. Use the same Simio process digital twin for decision support analysis, long term planning and detailed production scheduling. Whether you run the model once a week for insight into how to plan for upcoming demand fluctuations or run it multiple times a day, such as when an event occurs on your factory floor, Simio's powerful simulation engine can provide the details and risk assessment needed to make informed decisions on how to operate your business.

We are not resting on the success we've seen over the past decade – we are continuing to make Simio more powerful and flexible, while leading the industry with technology breakthroughs and attacking new markets with our disruptive technology.

This document describes some of the features that have been recently added to our software and provides information on how to reach out technical support, the online user forum, and social media accounts.

Welcome to the Simio family!

Gregory Lang  
Vice President, Software Development

# Simio Release Notes



## Support


The best way to get support is to use the **Simio User's Forum** found at [www.simio.com/forums](http://www.simio.com/forums), or contact us at [support@simio.com](mailto:support@simio.com) using one of the links on the Support Ribbon. Sign up on the user's forum as a **Simio Insider** to get full access to find product information, a place to post problems and questions, and the opportunity to engage in discussions with other users and the Simio team.

You can also find Simio User's Groups on:

**LinkedIn** (<https://www.linkedin.com/groups/55167>) and

**Facebook** ([www.facebook.com/groups/13863832711](http://www.facebook.com/groups/13863832711)).

Please visit our simulation community resources web page ([www.simio.com/resources.html](http://www.simio.com/resources.html)) for additional information.

The **Support Ribbon** (the Support tab) of the Simio software contains shortcuts to the above, plus much more. Don't miss the links to our on-line documentation, training, videos, downloads, and other helpful resources. While Simio includes comprehensive on-line help available at the touch of "F1" or  in the product, the numerous books and free video training courses provide a great way to get started using Simio.

Unfortunately, we cannot provide support to students. We encourage students to work through their instructors, or to reach out to the broader user community using the Simio Insiders User Forum.

## What is a Sprint?

We are following an agile methodology in which we develop in three week cycles called sprints. At the end of each sprint we have tested, documented, distributable software including new functionality. The following pages describe the enhancements added during each sprint. It is not necessary that you download and install every Sprint unless you are interested in a particular feature. But we encourage you to do so when convenient so that you are always working with the best software, documentation and examples we can deliver. Most sprints are posted to the Simio Insiders Downloads Topic. The public releases (discussed below) are updated approximately twice a year.

## Where to Find New Releases

The latest public software releases can be found at: [www.simio.com/download](http://www.simio.com/download). Your activation will continue to work with new releases as long as your maintenance is current. Newer releases are often available on the [Simio Insiders forum](#).

## Simio Release 15 – Sprint 254 – July 25, 2023

Welcome to Sprint 254! In this Sprint, you will notice enhancements to the Material Usage Log as well as the Network Element. Additionally, Data Tables can now be categorized.

Note: Simio Personal Edition has been deprecated from the software. This Sprint introduces Simio Trial Edition. Simio Trial Edition is a no cost version of Simio that expires thirty (30) days after installation and has no limits on what can be modeled. It is perfect for exploring and learning Simio's simulation capabilities.

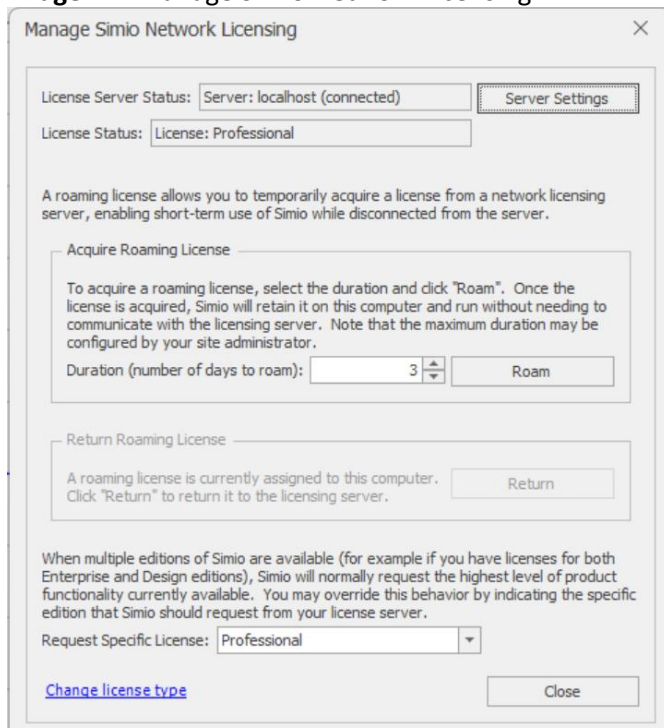
**Attention!** Users of Simio's on-premises network license type, managed by Reprise License Manager ("RLM"), must have an updated license server to use Simio 15.254 and newer. Simio 15.254 and newer should not be installed on client machines before RLM is updated to v15.1. Reprise license keys are in the format of four groups of four digits, e.g., xxxx-xxxx-xxxx-xxxx. Clients can verify their license type by visiting File > Licensing in Simio, where users of Reprise on-premises network licenses will show a dialog like in Image 1. If you are unsure if this requirement pertains to you, please verify your license type with your administrator or organization's IT/infrastructure team. Users of on-premises network licenses provided/managed by QLM are not affected.

In usual configurations, the license server is installed on a central machine, managed by the organization's IT/infrastructure team, and is not installed on client/end user machines.

RLM 15.1 can be found at <https://www.simio.com/downloads/public/software/RLMLicenseServer.php>

Please pay close attention to "02 README Updating from Previous Version" contained therein.

**Image 1** Manage Simio Network Licensing



### **Desktop Edition Features:**

**Material Usage Log - Expression Evaluation Enhancements** – This user requested feature allows custom expression columns to:

1. Get an attribute value of the object (entity) that has consumed or produced the material using the *Owner* keyword. For example, *Owner.Entity.Priority*.
2. Get a table row value referenced by the object (entity) that has consumed or produced the material using the *Owner* keyword. For example, *Owner.TableName.ColumnName*.
3. Get an attribute value of the site object if the material is location-based inventory. For example, *Site.StateName* if the site is an instance of an object class named 'Site'.
4. Get a table row value referenced by the site object if the material is location-based inventory. For example, *Sites.ColumnName* where 'Sites' is a data table defining all sites in the model.
5. Get a table row value referenced by the material. For example, *Materials.ColumnName* where 'Materials' is a data table defining all materials in the model.
6. Get a table row value referenced by the token that executed the Consume or Produce step in the process logic. For example, *ProcessingTasks.ColumnName* where 'ProcessingTasks' is a table defining the processing tasks for a task sequence at a Server.

**Data Table Categorization** – This user requested feature allows you to assign a *Category* to Data Tables. When you choose a Selected Table Category from the dropdown, Simio will only show the Data Tables that correspond to that *Category*.

**Network Element Enhancements** – These user requested features were implemented to improve usability of the Network Element. First, Network membership can now be set via Data Tables. Second, the Global Network is now exposed. Finally, the *Links Type* property can be set to 'All' to capture all links in the system.

## Simio Release 15 – Sprint 253 – June 20, 2023

Welcome to Sprint 253! In this Sprint, you will notice an additional Log Export Option as well as a new property pertaining to Task Sequences. Lastly, you will be able to change Axis Scale of Dashboards. Simio Portal Edition now provides the ability to reassign model ownership.

### Desktop Edition Features:

**Log Export Option – Export At End Of Experiment Replication Run** – This user requested feature allows you to export the specified Log for each Scenario and Replication in an Experiment when toggled on.

**Invalid Task Dependency Notification Type** – This user requested feature is a new property on the Task Sequence Element, Combiner, Separator, and Server objects that indicates the level of alert at runtime if the task sequence has missing, duplicate, or otherwise invalid data defining the task dependency relationships. There are three options: Error – Throw runtime error, Warning – Throw runtime warning and skip the invalid data, Trace – Write to trace and skip the invalid data.

**Ability to Change Axis Scale of Dashboard** – This user request allows you to specify axis scales, maximums and minimums, and ticks. This was designed to provide maximum flexibility for Dashboard display.

### Portal Edition Features:

**Ability to Reassign Ownership of Model** – This feature allows an Admin or the model owner to reassign ownership of the model to another user within your Portal.

## Simio Release 15 – Sprint 252 – April 28, 2023

Welcome to Sprint 252! In this Sprint, you will notice enhancements to the Expression Editor, table importation, and the Documentation Report. A new SimBit was also added during this Sprint. Portal gained the ability to view Sankey Diagrams and the Published Plan view now shows additional information.

Note: Though never guaranteed, Simio has made an effort to ensure models created in newer versions could be opened/viewed in older versions. They likely could not run, but they could be reviewed. In release 15.252, we made a change to the way Simio saves project files to help organizations compare Simio projects at a file level. Any model saved in 15.252 or newer will error when opening in version 15.250 and older. Moving forward, Simio's intent is to again allow models created in newer versions to be opened in 15.252 and above.

### Desktop Edition Features:

**Documentation Report Enhancements** – This feature allows for table schema descriptions to appear in the Documentation Report

**Expression Editor Enhancement** – This user requested allows you to space out an expression in the Expression Editor. Using Ctrl + Enter will create a new line and using Ctrl + Tab will create a tab. Both of these tools can be used to better organize an expression.

**New SimBit – Experiment With Data Configurations** – This SimBit shows how to create multiple Bindings for a table or Configurations for a Data Connector while using an Experiment.

**Table Importation Enhancement** – This feature allows you to manually edit tables if *Enable Automatic Bound Table Importing* is disabled. Prior to this Sprint, you could only manually edit tables if table data was imported manually.

### Portal Edition Features:

**Support for New Dashboards** – This feature allows for Sankey Diagrams to be viewed on Simio Portal Edition.

**Additional Information Shown on Published Plan** – This feature shows the Start Time, Ending Type, property values, and who published the Plan on the Published Plan view.

## Simio Release 15 – Sprint 251 – March 28, 2023

Welcome to Sprint 251! In this Sprint, you will notice source control enhancements as well as an animation enhancement for custom links. We also removed an obsolete file from the installation.

### Desktop Edition Features:

**Ability to Set the Path Decorator on the Object Definition** – This user requested feature allows Path Decorators to stay applied on a custom link.

**Saving as Simproj Enhancement – Processes get Saved to their own XML File** – This user requested feature was designed to support two modelers working on the same process. When *Save Project as Multiple Files* is set to 'True' and the file format is .simproj, Simio will produce a separate model file for Add-On Processes.

**Source Control Enhancement – Support Source Control Property** – This user requested feature changes a former property *Sign Files* to *Support Source Control*. Along with the name and description change, this property now will streamline the process of using source control by reducing the amount of information written out in the save history, if applicable.

**Removal of Obsolete File** – We have removed the CSVGridDataProvider example from the install.

## Simio Release 15 – Sprint 250 – March 7, 2023

Welcome to Sprint 250! In this Sprint, you will see two new properties for Bar Charts, Pie Charts, and Time Plots when using a *Data Source* of an Output Table. You will also see enhancements made to our filtering as well as the State Statistic element. We also made a change to our supported *Graphics Types*.

### Desktop Edition Features:

**Bar Chart/Pie Chart/Time Plot *Summary Function*** – This feature allows you to summarize data in one of Simio's charts when using a *Data Source* of an Output Table.

**Bar Chart/Pie Chart/Time Plot *Aggregation Interval*** – This feature allows you to aggregate data over a specified time frame when using a *Data Source* of an Output Table for Simio's charts.

**Table, Log, and Trace Filter Enhancement** – This user requested feature places an expression view at the bottom of each of the above filter locations which will allow you to create and edit filters more easily.

**State Statistic Enhancement** – This user requested feature allows the State Statistic element to Log Observations for non-numeric state values.

**Graphics Type Change** – OpenGL is no longer available as a *Graphics Type* in Simio.



## Simio Release 15 – Sprint 249 – January 27, 2023

Welcome to Sprint 249! In this Sprint, you will notice significant animation changes, importer and exporter enhancements, a new function, and periodic views of Logs. RPS Users will have a new Advanced Option for ending a Run. We wrapped this Sprint up with a Portal Experimenter enhancement and a Pivot Grid enhancement.

### Desktop Edition Features:

**New Function** – This feature adds the `TableName.NumericPropertyName.Sum` function to return the sum of the numeric property column's values in a specified range of rows based on an optional true or false condition.

**Database Exporter Enhancements** – This user requested feature allows commas to be used as a decimal separator.

**Web API Importer Enhancements** – This user requested feature adds two new properties to the Web API Importer: `NumberOfRecordsParameter` and `StartingOffsetParameter`.

**Advanced Option – Stop At End Of Run – RPS Edition Only** – This feature when toggled on will have the model run automatically stop without any user interaction. Prior to this feature, users would have to manually click the Stop button in order to stop the model.

**Periodic Views of Logs** – This feature provides additional Dashboard data sources that allows user to view various logs by day, hour, or week. You will be able to dashboard your results in accurate time periods.

**Bar Charts** – This user requested feature allows you to use Bar Charts in the Facility View of Simio. The Bar Chart can be set up to display data from Expressions, List States, Data Tables, or Output Tables.

**Enhanced Animation – Table Based Time Plots, Bar Charts, and Pie Charts** – This feature allows users to hook up any of the enhanced Charts to a Data Table or Output Table. Using a *Data Source* of either an Output Table or Data Table allows you to view the animation the same whether you Run the model or Fast-Forward the model.

**Ability to Show Display Name in Pivot Grid** – This user requested feature allows you to add an additional column to the Pivot Grid that will show the object's Display Name.

**API Change** - When running the SimioEngine using the API in a standalone or "headless" mode, the controlling program must now add references to Sqlite, since it is now incorporated into the SimioEngine. A recommended way is to use NuGet. For an example of this, see the GitHub project `SimioLLC/RunSimioSchedule`. The Sllite reference is required for all Simio versions after 15.245.

### Portal Edition Features:

**Ability to Define Which Response is Primary Response in Portal Experimenter** – This feature allows Experimenters to specify which of their Experiment's Responses is the Primary Response. This feature will enhance Experimenters ability to design their Experiments on Portal.

## Simio Release 15 – Sprint 248 – November 22, 2022

Welcome to Sprint 248! In this Sprint, we improved our Status Pie animation and added tooltips to Portal Edition's Box and Whisker Plots.

### **Desktop Edition Features:**

**Status Pie Enhancements** – This user requested feature provides animation enhancements to the Status Pie. You will now be able to specify the Status Pie as a “Pie”, “Donut”, or “Nested Donut” as well as setting custom *Color* expressions for the *Argument*.

### **Portal Edition Features:**

**Box and Whisker Plots Enhancement** – This user requested feature shows tooltip information such as mean, confidence intervals, half width, etc. on BoxWhisker plots in order to provide more information for each Experiment replications for each Scenario. Hovering over the graphic will display this information.

## Simio Release 15 – Sprint 247 – November 1, 2022

Welcome to Sprint 247! In this Sprint, we added a new replenishment policy and Log. We wrapped up this Sprint with an enhancement to the Watch Window and a VR enhancement.

### **Desktop Edition Features:**

**New Inventory/Material Replenishment Policy** – You will notice a new *Replenishment Policy* of ‘Demand-Driven MRP’ on the Inventory and Material elements. DDMRP revolves around strategically placed stock positions called buffers that decouple demand from supply. These inventory buffers are comprised of three color-coded zones: Green, Yellow, and Red.

**Inventory Review Log – RPS Only** – This new Log automatically records inventory review events when the *Log Inventory Reviews* Boolean is toggled on for the Material or Inventory element. This Log can be useful for determining inventory quantity, qualified spike demand, net flow position, zone sizes, and recommended order quantity.

**Watch Window Enhancement** – This user requested feature allows you to view the current table references for any associated modelling objects in the Watch Window to improve the debugging table references process.

**Virtual Reality Enhancements** – This user requested feature allows Oculus users to use the ‘A’ button on a controller to move to the location in the middle of their vision and the ‘B’ button to return to the origin of the Facility view.

## Simio Release 15 – Sprint 246 – October 11, 2022

Welcome to Sprint 246! In this Sprint, we added a Reset Variables button. Also, you will notice an enhancement to our Status Pie and Status Plot. We also made a variety of improvements to performance.

### **Desktop Edition Features:**

**Reset Variables Button** – This feature was designed to provide a way to reset the model without running the initialization logic or importing any automatic bindings. By selecting the dropdown on the Reset button, you can choose Reset Variables which will reset state columns, output tables, model results, and logs.

**Enhanced Animation Plots and Pies** – This feature was implemented to make the data source specification between Status Pie and Status Plot consistent. You will now be able to select what type of *Data Source* (i.e., 'Expressions', Logs, Tables, etc.) to use. Once you select the desired *Data Source*, additional properties will appear to give you the most flexibility with your animation.

## **Simio Release 15 – Sprint 245 – September 20, 2022**

Welcome to Sprint 245! In this Sprint, we closed several bugs and made a few refactors to improve application performance.

## Simio Release 15 – Sprint 244 – August 30, 2022

Welcome to Sprint 244! In this Sprint, you will see a new Experiment property on both Desktop and Portal. You will notice an enhancement to a recently added feature and an accessibility enhancement. This Sprint wrapped up with the addition of the Entity States Window.

### Desktop Edition Features:

**Accessibility Enhancement** – This user requested feature allows you to use the Esc key on the keyboard to deselect an object in the Facility Window.

**Response *Description* Property in Experiments** – This user requested feature allows for a *Description* field to be added to each Response in an Experiment in order to provide more context for each Response.

**Option to Turn Off Auto-Merged File from Write Step** – This user requested feature allows you to toggle on/off the auto-merged write file from Experiments. The *Auto Merge Write Step Files For Experiment* property on the File element is set to 'False' by default. See Sprint 241's Release Notes for more information on this feature.

**Entity States Window** – This user requested feature gives a window to view all active entities in the model by entity type, displaying properties and states of each. This window allows a double click on any entity listed in the window and navigate to where the entity is in animation.

### Portal Edition Features:

**Response *Description* Property Displayed in Experiments** – This user requested feature displays the *Description* field added to each Response in an Experiment in order to provide more context for each Response.

## Simio Release 15 – Sprint 243 – August 9, 2022

Welcome to Sprint 243! In this Sprint, you will have access to a new animation type and there is an enhancement to Data Connectors.

### **Desktop Edition Features:**

**New Animation – Status Table** – This feature was implemented to have an easy way to display information from a data table in the Facility View. The Status Table works with Properties and States in a Data Table and will automatically size the structure. You can set the colors of different areas of the Status Table. The Status Table will show the first 50 rows of data.

**Multi-Line Data Connector String Property** – This feature allows you to streamline steps needed to transform and cleanse data before importing the data into the Simio data tables.

## Simio Release 15 – Sprint 242 – July 26, 2022

Welcome to Sprint 242! In this Sprint, you will notice a property change in Desktop as well as a new Export Status option in Portal. This Sprint also included a new step and a new Dashboard. This Sprint wrapped up with two Web API Connector enhancements and an improvement to the Object Updates Available window.

### Desktop Edition Features:

**States Enhancement – *Keep Values Between Runs*** – This property replaces the property *Keep Values On Run Restart* Boolean property. Now you will have three options on keeping values between runs.

- ‘Never’ – Never keep the Output Table or State Column’s values from the previous run when starting a new run
- ‘Always’ – Always keep the Output Table or State Column’s values from the previous run when starting a new run.
- ‘OnRunRestart’ – Keep the Output Table or State Column’s values from the previous run if a run restart occurs using the RestartRun step.

**UnSetRow Step** – This new step was designed to remove table row references previously set for the executing token or a specified object or element. The UnSetRow step can assist in resolving row reference conflicts.

**Sankey Diagram Dashboard** – This user requested feature gives an additional Dashboard option to display results. A Sankey Diagram is a visualization that can be used to depict a flow from one set of values to another.

**Web API Connector Enhancements** – These features include two enhancements to the Web API Importer and Exporter. First, the Web API Exporter can export multi-row. Second, a new authorization type “MSAL” has been added. MSAL silently authenticates the user using username and password.

**Ability to Select/Deselect all Objects at once in Update Object Dialog** – This user requested feature was designed to easily update all objects at once when updates are available.

### Portal Edition Features:

**Status for Manual Exports** – This user requested feature shows the progress of a manual export from the Scheduler Mode in Portal. Using the Export Status selection from the Export Table drop down will show the status of the export from Portal.



## Simio Release 15 – Sprint 241 – June 28, 2022

Welcome to Sprint 241! In this Sprint, will notice two material handling enhancements, a combined file created by the Write step on an Experiments with multiple replications, and a routing enhancement.

### Desktop Edition Features:

**Consume Step Enhancement – *Immediately Try Consume*** – This user requested feature was implemented to improve Material modeling. This enhancement allows you to choose to immediately consume a Material at a Process step level instead of at a model level.

**Produce Step Enhancement – *Immediately Try Allocate*** – This user requested feature was implemented to improve Material modeling. This enhancement allows you to choose to immediately allocate a Material at a Process step level instead of at a model level.

**Combined Files Created by Write Step when Running an Experiment with Multiple Replications** –When a Model contains Write Steps in its Process Logic, and an Experiment is run, the output files can be merged for improved data portability, provided in addition to a file per Scenario per Replication. This was a user requested feature.

**Ability to Use Constraint Logic on TransferNode** – This user requested feature allows TransferNodes with an *Entity Destination Type* of 'BySequence' or 'Specific' to have additional Constraint Logic on them in order to ensure constraint requirements are met prior to routing to the next destination.

## Simio Release 15 – Sprint 239/240 – June 7, 2022

Welcome to our release of Simio 15! In this Sprint, you will notice a Real Time Clock in RPS and Partner Edition. You will also notice enhancements to our WebAPI Connectors. This Sprint wrapped up with a Gantt enhancement in Portal Scheduler Mode and two new UTC functions.

### Desktop Edition Features:

**Real Time Clock – RPS and Partner Edition Only** – This feature which was designed to assist in orchestrating the real time execution of the system modelled and adds a Real Time Clock button in the Run Speed section of the Run ribbon. When this is toggled on, the simulation clock will advance at the same rate as a real clock if running the model interactively.

**WebAPI Data Connector Enhancements** – This feature was added to improve the quality of our WebAPI Importer and Exporters by setting the way external data is imported/exported in a standard and proven way by passing parameters and transferring relevant data.

**Ability to Delete Object by Right-Clicking** – This user requested feature was implemented to improve Simio's useability. Now, you can right-click on an object or multiple objects and select "Delete" in the drop-down menu to remove an object from the Facility Window.

**Additional UTC Functions** – This user requested feature provides two new functions that can be used:  
Run.TimeNowUtc: Returns the current simulation time in hours, expressed as Coordinated Universal Time (UTC).

Run.TimeNowUtcOffset: Returns the offset in hours between the simulation clock's time zone and Coordinated Universal Time (UTC) for the current simulation time.

### Portal Edition Features:

**Show Filtered Out Items button to Gantt ribbon in Portal Scheduler Mode** – This user requested feature allows you to right-click on the Gantt ribbon to 'Show Filtered Out Items' that either turns off all filtered items or shows them in a lighter mode when Gantt is filtered. This feature also further aligns Simio Portal with Portal Desktop.

## Simio Release 14 – Sprint 238 – April 26, 2022

Welcome to Sprint 238! In this Sprint, you notice an enhance Expression Editor as well as two other UI enhancements. There is also a new API feature that allows for object rotation and an enhancement to Step API. This Sprint wrapped up with a new Portal debugging tool.

### **Desktop Edition Features:**

**Enhanced Expression Editor** – This feature was designed to improve the user experience of entering long expressions into the Expression Editor. The Expression Editor will now be a minimum of three text lines in height and can be gripped and dragged to best accommodate large expressions. Lastly, the expression editor can be pinned and unpinned to the property panel to further allow maximum flexibility. Simio will save the last used size and location of the expression editor.

**Up and Down Buttons for States** – This user requested feature allows you to move States up and down in the Definitions tab. Moving a State up or down will affect its location in the Watch window which can help with debugging.

**Move Leftmost and Rightmost Buttons for Table Columns** – This feature was implemented to improve data table structure management. You can use the Move Leftmost or Move Rightmost buttons to move a column all the way to the left or right, in its respective section, i.e., all Properties will stay together, and all States will stay together.

**New Property Type and Runtime Interface Added to Step API** – This new property type and runtime interface added to Step API that allows user code to read and modify an output table. This enhanced Step API capability enables output data to be passed into a custom step, modified within the step, and passed back to the model at runtime.

**API Support for Object Rotation** – This user requested feature allows you to alter the *Yaw* of an object in a Simio model via the API.

**Export Portal Modelling Errors** – This user requested feature lets you export all model error messages to a CSV file that automatically opens in order to improve the workflow of Portal modelling. Prior to this Sprint, Portal modelling errors would only appear after loading the model on to Portal, but with this feature, users can see the errors prior to uploading which allows error resolution earlier in the process.

## Simio Release 14 – Sprint 237 – April 5, 2022

Welcome to Sprint 237! In this Sprint, you will notice two Constraint Logic element enhancements as well as two new JSON functions. We also added a Date Column in Trace and the ability to open unsigned files in Design Edition. This Sprint finished up with an enhancement to the Expression Editor. Portal Edition also received a new Import Status window.

### Desktop Edition Features:

**Unsigned Files Open in Design Edition** – This user requested feature allows for Simio files that are chosen to be saved unsigned to open in Design Edition. This may be useful for when multiple authors working on a Simio file. Note: The recommended value of *Sign Files* is 'True'.

**New JSON Functions** – This feature adds two new JSON functions to Simio.

`String.Json.Count(String, Path)` returns the number of elements in an array found in a specified JSON formatted string using the given path.

`String.Json.Value(String, Path)` returns the string representation of a value found in a specified JSON formatted string using the given path.

**Constraint Logic Element Enhancement – Allow User-Specified Owner** – This feature allows a specific object to be the owner of a Constraint Logic element. The *Owner Type* may be specified as either the object associated with the constrained process step, the parent object, or as a specific object reference.

**Constraint Logic Element Enhancement – Reevaluate *Number of Resources* and *Units per Resource* Expressions** – This user requested feature enhances resource constraint evaluation. Prior to Sprint 237, the *Number of Resources* and *Units per Resource* properties were only evaluated at the beginning of the model run. This enhancement now has these two properties checked every time the resource constraint is evaluated.

**Date Time Column in Trace** – This user requested feature adds an additional column in the Trace window which will display the date and time of each action that occurs in the model run. This feature was designed to improve debugging models by adding another way to view time in Trace.

### Portal Edition Features:

**Scheduler Mode Import Status Window** – This feature provides an additional drop-down window in Portal Scheduler Mode that shows the status of any tables that are being imported. This automatically refreshing pop-up page will show if each table is complete, cancelled, running, pending, or failed pertaining to its respective import. It will also display the last completion time of the import for each respective table.

## Simio Release 14 – Sprint 236 – March 15, 2022

Welcome to Sprint 236! In this Sprint, you will be able to copy data from a Grid or Pivot Grid on both Portal and Desktop. Additionally, the Adam Optimizer has been added as another option for the Neural Network Trainer.

### Desktop Edition Features:

**Adam Optimizer** – This Neural Network enhancement provides an additional *Optimizer Type* for the Neural Network Trainer. The Adam optimizer is an extension to stochastic gradient descent that has recently seen broader adoption for deep learning applications.

**Ability to Copy Data from a Grid or Pivot Grid** – This user requested feature was implemented to allow grid or Pivot Grid data from Simio Desktop to be copied and then later pasted into another field so it can be filtered.

### Portal Edition Features:

**Ability to Copy Data from a Grid or Pivot Grid** – This user requested feature was implemented to allow grid or Pivot Grid data from Portal to be copied and then later pasted into another field so it can be filtered.

## Simio Release 14 – Sprint 235 – February 22, 2022

Welcome to Sprint 235! In this Sprint, you will notice two new Neural Network features as well as three new String functions. You will also now be able to reference State Columns with `TableName[Index1, Index2]` and set the default *Path Color* of a Link definition. We wrapped up this Sprint with enhancements to the Save Log and Starting Type. Portal Edition received a Date/Time regional update and the ability to use Dashboards that utilize the Periodic Statistics Logs. This Sprint finished with an UI enhancement to Scheduler Mode.

### Desktop Edition Features:

**Save Log Enhancements** – This feature includes an additional column that contains whether the object's entry was added due to a save or a copy into another model as well as a change in time being recorded in UTC to local time. These changes were added to improve debugging.

**Ability to Set *Path Color* of a Link Definition** – This user requested feature allows you to set the *Path Color* of a link definition to something other than the default of 'SaddleBrown'.

**New String. Functions** – This feature provides three new String functions within Simio. `String.Replace` returns a copy of the specified string where all instances of a specified substring are replaced with another specified string. `String.RegEx.Contains` returns True if a substring matching a specified regular expression pattern is found in the specified string. `String.RegEx.Replace` returns a copy of the specified string where all substrings matching a specified regular expression pattern are replaced with another specified string.

**Generate Training Data for Neural Network Automatically** – This feature provides a tool to simplify the process of generating a specific number of training data records for a Neural Network. Prior to Sprint 235, you would manually have to change the *Replication Number* of the model and then rerun, however, this feature allows that change to be done automatically and ensures that there will be no duplicate streams run.

**Neural Network Save Training Data to CSV Enhancement** – This feature allows a user to export the predicted value and error value for each training data record after running a trained Neural Network Model.

**Starting Type Enhancement** – When a *Starting Type* of 'At the start of run, use current' is selected for a model, this feature allows the time zone in which the model should be run in to be selected. By default, this value is set to 'Device Time Zone'. This is particularly useful for models where the application is run in a different time zone than the physical location being modeled.

**Ability to Reference State Column with `TableName[Index1,Index2]`** – This user requested feature allows for you to directly reference a State Column by using `TableName[Index1,Index2]`. This feature was implemented to speed up models by reducing the amount of process logic needed to achieve the same functionality a different way.

### Portal Edition Features:

**Date/Time Formatting Enhancement** – This feature adjusts the Date/Time formatting within Portal to match your regional browser settings.

**Enhanced Dashboards** – This feature adds the ability to have Dashboards on Portal that contain data from Periodic Statistics Logs.

**Enhanced Scheduler Mode Control Properties Panel** – This user requested features was designed to improve distinguishability between different sections of Properties. The Scheduler Mode Properties Panel will now have Categories for better sorting.

## Simio Release 14 – Sprint 234 – January 28, 2022

Welcome to Sprint 234! In this Sprint, you will be able to use new location functions as well as set the length, width, and height of auto-created objects in data tables. We wrapped up this Sprint with a toggle to turn on/off Experiment statistical recording and a new Object Save Log. Portal Edition also received numerous bug fixes as well as a toggle to autofit Scheduler Mode table columns.

### Desktop Edition Features:

**Ability to Toggle Experiment Statistical Results Recording** – This user requested feature was designed to speed up Experiment run time by turning off any model statistics collections. Setting *Generate Statistics* to 'False' can be useful for Experiment runs where only collecting KPIs from Responses is needed.

**New Location Functions** – This user requested feature was implemented to provide a new `LocationAt.Cartesian(x,y,z)` function that can be utilized in functions like `LocationAt.Cartesian(0, 0, 0).Latitude` or `LocationAt.Cartesian(0, 0, 0).Longitude` to get either the latitude or longitude geographic coordinates for any set of x, y, z Cartesian coordinates.

**Ability to Set Length, Width, and Height of Auto-Created Objects from Data Tables** – This feature allows for auto-created objects to have their *Length*, *Width*, and *Height* specified in columns of a data table. These three additional Object column properties will only appear when setting *Default Value Instantiation* to 'AutoCreateInstance'.

**Object Save Log** – This feature tracks the Saved Date Time, Product Version, and Edition for each object in an .spfx file. A new entry will only be added if the Product Version or Edition is different from the last entry. This feature was designed to assist in debugging and can be found by right clicking on an object in the Navigation menu.

### Portal Edition Features:

**Ability to Autofit Scheduler Mode Data Table Column Width** – This user requested feature allows you to toggle autofitting data within data tables by right clicking on a column header in a respective table in Scheduler Mode.



## Simio Release 14 – Sprint 233 – January 11, 2022

Welcome to Sprint 233! In this Sprint, you will be able to use OptQuest to optimize Table Configurations, use a table column for *Transporter List Name* as well as a number of Neural Network enhancements. We wrapped this Sprint up with Portal bug fixes and a Portal UI improvement.

### Desktop Edition Features:

**Ability to Export a Neural Network Model to an ONNX File Format** – This feature allows you to export either an ONNX Neural Network model that you previously added to the Simio project or a selected Feedforward Neural network Model that you built and trained directly within Simio. You can then import this saved ONNX file into a 3<sup>rd</sup> party software that supports ONNX file format.

**Ability to Untrain a Neural Network Model** – This feature allows you to easily revert a trained feedforward model back into the initial untrained state.

**Untrained Prediction Value Expression Property** – This new Neural Network property's expression is used as a substitute to return a predicted output value if the associated Neural Network is not trained.

**Neural Network Enhancements** – This feature provides some general improvements for Neural Network models. *Is Trained* and *Last Update Time (UTC)* properties provide additional information that can be useful in monitoring a Neural Network model. Additionally, in the Neural Network Trainer the default Number Hidden Nodes for an untrained feedforward neural network model has been changed from being always '10' to being the model's input layer size.

**TransferNode Enhancement** – This user requested feature expands the *Transporter List Name* property on a TransferNode when the *Transporter Type* is 'Select From List'. Prior to this Sprint, *Transporter List Name* had to be a List, but this enhancement now allows for it to also be table based.

**Experiment Enhancement** – This user requested feature allows Table Configurations to be included in an Experiment's OptQuest optimization. Setting *Include in Optimization* to 'Yes' on a Configuration will allow that multiple Configuration Table to have OptQuest use its algorithm to enhance the optimization capabilities of Simio.

### Portal Edition Features:

**Add Current User's Name to the List of Assigned Users in Scheduler Mode** – This user requested feature was implement for when the current owner of a model assigns the model to a different user and then later wants to take the plan back. This feature also provides clarity by displaying the current user's name in the assigned user's dialog.

## Simio Release 14 – Sprint 232 – December 3, 2021

Welcome to Sprint 232! In this Sprint, we improved our STEP file importing as well as improved our Error and Trace messaging. We wrapped up this Sprint with two new Location functions and with an Open Plan From Portal improvement.

### **Desktop Edition Features:**

**Improved STEP File Support** – This user requested feature improves Simio’s ability to import STEP files in a model.

**Improved Error and Trace Messaging** – This feature provides extra context for table resolution in Trace and Error messages.

**Open Plan From Portal Enhancement** – This user requested feature pulls in the date and time that a Portal Run has occurred when using Open Plan From Portal on Simio Desktop. This was designed as a way to verify the date and time of a Portal Run while reviewing the model in Simio Desktop.

**New Location Functions** – This user requested feature provides two additional location functions that can be useful in determining an object’s projected location. ‘Location.Latitude’ and ‘Location.Longitude’ will provide an object’s projected latitudinal or longitudinal location.

### **Portal Edition Features:**

This Sprint contained various Portal Edition bug fixes.

## Simio Release 14 – Sprint 231 – November 10, 2021

Welcome to Sprint 231! In this Sprint we added the ability to conditionally set the *Ride On Transporter* property as well as enhanced the Results tab Resource Gantt. Also, four new Add-On Process Triggers were added for Task Sequences. We wrapped up this Sprint with adding the ability to set the sequence tables will export and improving Portal data tables.

### Desktop Edition Features:

**Ride On Transporter Property Enhancement** – This customer requested feature allows you to now select 'Never', 'Always', or 'Conditional' for the *Ride On Transporter* on a Transfer Node. This feature was implemented to give additional flexibility with regards to dynamically riding on transporters.

**Additional Task Sequence Add-On Process Triggers** – This customer requested feature adds four additional Add-On Process Triggers in Task Sequences of Servers, Combiners, and Separators. These additional Triggers are 'Seized Resource', 'Released Resource', 'Consumed Material', and 'Produced Material'.

**Results Resource Gantt Enhancement – Professional and RPS Only** – This customer requested feature displays the Population Members for Workers and Vehicles on the Resource Gantt that is located in the Results tab. This was designed to improve debugging of Simio models when there is more than one population member of a transporter.

**Ability to Set the Sequence Data Table Exports Occur – RPS Only** – This customer requested feature allows you to define the order data tables should be exported out of Simio. The Set Export Sequence popup lives under the Export Options on a data table. This feature is useful for when data tables have dependencies on other data tables.

### Portal Edition Features:

**Duration Since Last Import Added for Bound Data Tables within Scheduler Mode** – This customer requested feature informs Portal Schedulers the amount of time that has passed since a respective data table has been last imported.

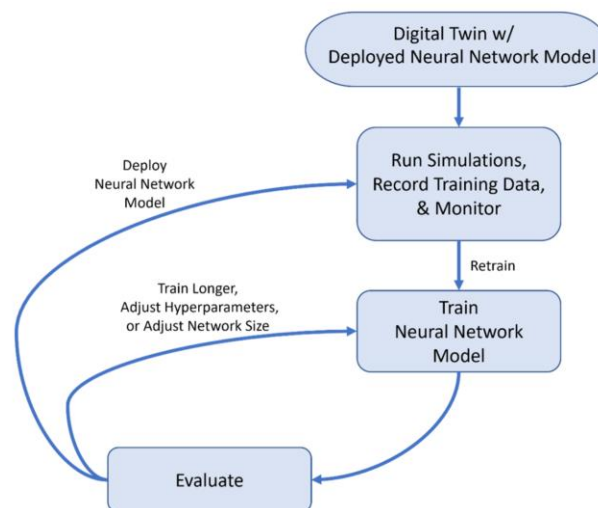
## Simio Release 14 – Sprint 230 – October 18, 2021

Welcome to Sprint 230! This is the second major release of 2021. In this Sprint, we added the Neural Network Element and Neural Network Models which allows you to use Simio's machine learning features. This release also contains a SimBit demonstrating how to use the neural network features.

### Desktop Edition Features:

**Neural Network Models – Academic, Professional, RPS Only** – Simio's new machine learning features allow you to not only use a neural network (NN) in Simio model logic, but you can also use the simulation to collect training data and then train your neural network from within Simio. Simio provides the ability for users to define, train, and use a NN in a Simio model with no external libraries or complex coding. Simio also supports the popular AI file format standard, ONNX. Users can import a NN into a Simio model that was defined and trained in any number of popular products which support the ONNX file format.

The Simio implementation of neural networks focuses on regression models for predicting values. These models are often feedforward, where data moves from the input neurons of the network to the output neurons and does not loop back to the input neurons. Currently, Simio supports training feedforward neural networks with one or more inputs and one output. Add a neural network to the model to make the decisions, and then we train the neural network using simulation data so that the model gets better and better at making the correct decision over time.



**New SimBit: Neural Networks** – This SimBit includes four models providing examples of Simio's neural network features. This SimBit starts with a base system and then shows how to set up a model to record training data, training the model, and then finishes up by demonstrating using a previously trained neural network model saved in the ONNX file format.

### Portal Edition Features:

**OptQuest in Portal Experimentation** – Simio has added support for using the OptQuest Add-In with experimentation on the Simio Portal. This functionality will require an OptQuest license.

To learn more about experimentation on the Simio Portal product, contact your Simio representative, Simio authorized partner, or email us at [info@simio.com](mailto:info@simio.com)

## Simio Release 14 – Sprint 229 – September 24, 2021

Welcome to Sprint 229! In this Sprint, we have added a new SimBit, added a toggle for Breakpoints, added the ability to set the order data tables import, and provided the ability to select an active binding for a model in Portal Experimentation.

### Desktop Edition Features:

**New SimBit: Controlling Entity Orientation with Queue** - This SimBit project includes two models providing use cases and illustrations of entity orientation in a queue.

**Breakpoint Toggle** – This feature allows you to make all Breakpoints visible or invisible in the Facility window by toggling the Breakpoints button on the Visibility Ribbon. Breakpoints will still exist with the toggle turned off, instead they will just not be shown.

**Ability to Set the Sequence Data Table Imports Occur** – This feature allows you to define which order the data tables should be imported into Simio when being auto-imported. The Set Import Sequence popup lives under the Binding Options on a data table. This feature is useful for when data tables have dependencies on other data tables.

### Portal Edition Features:

**Ability to Select Active Binding in Portal Experimentation** – This feature allows for models that have been uploaded to Simio Portal Edition to be able to select which Binding is to be used for each Scenario when running an Experiment on the Simio Portal.

## **Simio Release 14 – Sprint 228 – August 31, 2021**

Welcome to Sprint 228! While there are no new features added to our Desktop product this Sprint, we have added a number of features in our cloud-based Portal Edition.

### **Portal Edition Features:**

We've added a new Portal Users Guide, which documents the user experience in our Portal Product. You will also notice an improved administrative experience on Portal, when adding new users and assigning licenses, which is now all controlled within the Users Administration page. There is a new feature which allows an administrator to enable custom text across the top of each Portal page. For example, if you have a test Portal environment and a production Portal environment, you might consider adding custom text across the top of each to indicate to your users which Portal they are currently logged in to. Finally, you will see the ability for a model owner to assign model users on their model and these users will not only be able to see the results of the plans run on that model but will also be able to copy a plan and download a plan to Desktop.

## Simio Release 14 – Sprint 227 – August 10, 2021

Welcome to Sprint 227! In this Sprint, you will notice Entity Workflow Gantt enhancements as well as an Extras Library Bay enhancement. You will also notice an enhancement to the Produce step. We finished up this Sprint with support for Sketchup 2021 and a .NET Framework change.

### **Extras Library Enhancement – Bay Traversal Direction**

This customer requested feature allows you to specify the direction that the bridges in the Bay move, either 'Left and Right' or 'Forward and Back'.

### **Installation Change – Simio Now Requires .NET Framework 4.7.2**

This change requires you to have .NET Framework 4.7.2 on the machine running Simio. If you are on an up-to-date version of Windows 10 or Windows Server 2019, you will notice no difference. If you are not up-to-date, please install Simio via setup.exe which will bootstrap the .NET Framework 4.7.2 for you.

### **Sketchup 2021 Support**

We have updated our Sketchup import to support Sketchup 2021.

### **Ability to Place Associated Tasks Under Owner Row on the Entity Workflow Gantt**

This feature allows you to better distinguish which Task is associated with each Owner in the Entity Workflow Gantt. In Sprint 227, you can set a Log Expression Column in the Task Log that corresponds to a Log Expression Column in the Resource Usage Log and when you set the *Owner Row* of the Gantt to this column, Tasks will now appear under them.

### **Ability to Place Transporters Under Owner Row on the Entity Workflow Gantt**

This feature allows you to better distinguish which Transporter is associated with each Owner in the Entity Workflow Gantt. In Sprint 227, you can set a Log Expression Column in the Transporter Usage Log that corresponds to a Log Expression Column in the Resource Usage Log and when you set the *Owner Row* of the Gantt to this column, Transporters will now appear in the Owner's Row.

### **Produce Step Enhancement**

This customer requested feature for an *On Produced Process* on the Produce step allows you to specify an optional process to be executed when Material is produced.

## **Simio Release 14 – Sprint 226 – July 20, 2021**

Welcome to Sprint 226! In this Sprint, you will now be able to import from an Excel PivotTable and see which parent object an associated object is associated to in the Internal References. We wrapped up this Sprint with added export support for additional databases Data Connectors.

### **Ability to Import from an Excel PivotTable**

This customer requested feature allows you to import data for a data table directly from an Excel PivotTable object, not just an Excel Worksheet.

### **Improvement to Internal References Associated Column**

This customer requested feature enhances the Associated Column in the Internal References of the model to now show what parent object the associated object is associated to and places it in the Associated To column.

### **Ability to Export to MySQL, Oracle, and SAP HANA with Database Data Connector**

This feature request allows Simio to now support exports for MySQL, Oracle, and SAP HANA.



## Simio Release 14 – Sprint 224/225 – June 29, 2021

Welcome to Sprint 224/225! In this Sprint, you will notice the Standard Library and Flow Library .spfx files have moved to a new location as well as object orientation improvements. We finished up this Sprint with improvements to our importing/exporting capabilities.

### File Location Change

In this Sprint we have moved the location the Simio Standard Library and Flow Library files to [Simio Install Location]\Libraries folder (likely C:\Program Files (x86)\Simio\Libraries).

### Ability to have an Object's Attached Nodes, Queues, Labels Respond to Orientation Changes

This customer requested feature allows you to toggle on/off if an attached Node, Queue, or Label will rotate (change its location) with the parent object. Additionally, Labels and Queues you can toggle whether or not the orientation will change with the parent object. By default, all attached things with rotate its location and orientation with its parent. This toggle can be found by right clicking on the attached object.

### Auto-Created Objects Enhancement

This customer requested feature allows you to specify an Auto-Created Object's *Yaw* property so when the object is created, it will be created with a specified orientation.

### Ability to Map Property String Values to Import/Export String Parameters

This feature adds a new syntax `${property:Name}` which inserts the string value of the property 'Name' in string parameters for all import/export Data Connectors. This allows you to add two new top level string properties called `ExportSeparator` and `ExportFileName` and this allows you to setup a CSV Exporter using the new `${property:Name}` syntax like so:

Configuration	Write Headers	Separator	Expo
▶ [Default]	<input checked="" type="checkbox"/>	<code>\${property:ExportSeparator}</code>	
TableConfigs			
Table Name	File Name		
▶ Table1		<code>\${property:ExportFileName}</code>	

Once that is setup, the values given for `ExportSeparator` and `ExportFileName` will be used for the parameter values of the exporter and will live update.

### Ability to Import from an Excel Table

This customer requested feature allows you to import data for a data table directly from an Excel Table object, not just an Excel Worksheet.

## Simio Release 14 – Sprint 223 – May 18, 2021

Welcome to Sprint 223! In this Sprint, you will notice we have consolidated some of our file locations as well as added the ability to export the Error Log.

### File Location Change

In this Sprint we have moved the location of all files that were installed to C:\Users\Public\Documents\Simio, such as SimBits, Examples, Symbols, Path Decorators, etc., to the same location we install Simio, C:\Program Files (x86)\Simio, by default.

Simio now looks in three places for things to load into Simio

1. The new standard path of Simio Install Directory\Thing, i.e., C:\Program Files (x86)\Simio\Symbols
2. The user path of My Documents\Simio\Thing, i.e., C:\Users\MyName\Documents\Simio\Symbols
3. The legacy path of Public Documents\Simio\Thing, i.e., C:\Users\Public\Documents\Simio\Symbols

Note: If you plan on saving an older version of Simio on your computer, you will need to paste an older version of what use to be in C:\Users\Public\Documents\Simio back into that same spot *after* installing Simio 14.223.

### Ability to Export the Error Log

This user requested feature was designed to allow for the Error Log to be viewed in 3<sup>rd</sup> party software when there are large volumes of data errors to analyze. When you right click on the Error Log, you can select “Export View To” and then choose either CSV or Excel.

## Simio Release 14 – Sprint 222 – April 27, 2021

Welcome to Sprint 222! In this Sprint, you will be able to have more Tie Breakers for Largest/Smallest Value Selection Rules and be able to use a new 'Math.ExpectedValue' function.

### **New Math Function – Math.ExpectedValue(RandomExpression)**

This new feature comes from an academic request. This new function deterministically evaluates the specified random expression and returns the expected value.

### **Expanded *Tie Breaker Rules* Functionality for Largest/Smallest Value Selection Rules**

This new feature lets you use a repeat group for *Tie Breaker Rules* on 'Smallest Value First' and 'Largest Value First' so you can have multiple tiebreakers ranked in the order they are listed.

## Simio Release 14 – Sprint 220/221 – April 6, 2021

Welcome to our release of Simio 14! In this Sprint, you will be able to have entities visible in a Queue with the Queue being invisible, as well as use an enhanced color picker. We also improved our Task Sequence expression syntax. Additionally, you will be able to investigate four new SimBits!

### Queue Line Externally Visible Toggle

This user requested feature allows objects to appear where an invisible Queue is located. This per-Queue toggle is accessed by right-clicking on a Queue and clicking “Queue Line Externally Visible”, turning this toggle off will render the Queue invisible but objects will still appear in the Queue’s location in an external space.

### Improved Expression Syntax in Task Sequence *Condition or Probability*

This feature simplifies the expression needed when wanting to use a Server reference in a Task Sequence. Prior to Sprint 220, an expression had to reference the ModelEntity, for example, ‘ModelEntity.Location.Parent.Server.StateVariable>1’, and now you can use a simpler expression such as ‘Server.StateVariable>1’.

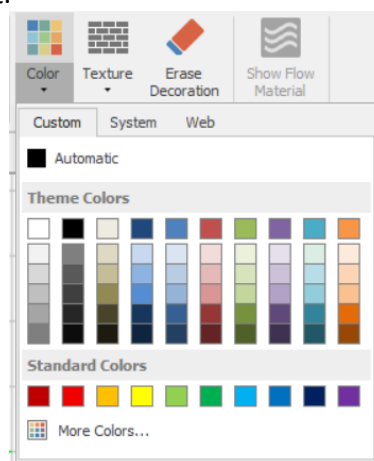
### Improved Changeover Logic

This feature was designed to improve the speed Simio runs when using a large “from-to-changeover matrix” directly in a data table that is mapped to the Changeover Logic’s *Setup Transitions* repeat group.

Note: If loading a model saved in Sprint 219 or earlier, the *Always Use Property Parent Table References* advanced compatibility bit will need to be set to ‘True’ to use the modelling approaches illustrated above.

### Enhanced Color Picker

This feature was implemented to improve the animation in Simio. This feature was intended to give you a more dynamic color selection throughout Simio as well as provide the ability for custom colors in your animation. Note: Custom colors can have transparency, however, proceed with caution as the behavior may not do exactly what you expect.



### New SimBits

**Constraint Logic** – This SimBit contains three models demonstrating the use of Constraint Logic Elements for modelling constraint-driven situations.

**Merging Conveyors Controlled By Gate** – This SimBit contains three models demonstrating the use of a Resource as a gate for merging conveyors.

**Transporting Varying Seized Entities** – This SimBit contains two models demonstrating a modelling approach for considering an Entity's size for loading on a Transporter with limit capacity.

**AutoCreate Paths With Vertices** – This SimBit contains one model that demonstrates a modelling approach for auto-creating links that have vertices in them.

## Where's the Rest?

In case you are a history buff who would like to see a sprint by sprint account of how we got to this point, you can find that here:

<http://www.simio.com/downloads/public/documents/SimioHistoricalReleaseNotes.pdf>. This contains records from the first 220 sprints (0-219) covering the generation of Simio major releases 1 – 12.